28 January 2015

TECHNICAL MEMORANDUM FOR Army National Guard (ARNG) Directorate
Mark Leeper, Environmental Cleanup Program Manager,
111 S. George Mason Drive, Arlington, VA 22204

SUBJECT: Summary of the Findings of Historical Review and Risk Evaluation of the Storage Magazines on the Former Ravenna Army Ammunition Plant (RVAAP), Ravenna, Ohio and Appended Information Paper Containing Documentation to Support Findings

(1.) SITUATION:

a.) The Army and the Ohio Environmental Protection Agency (Ohio EPA) have discussed the potential for contamination from the Storage Magazines and the possibility of including them as an Area of Concern (AOC) for several years. The Storage Magazines include both earth-covered magazines (ECMs) and above-ground magazines (AGMs). The ECMs are commonly called igloos. The Ohio EPA has requested that the Army make the igloos an AOC and investigate them and surrounding media to document their storage history and to determine if contamination exists due to former munitions storage operations. See Sections 1, 2, and 3 of the Appendix A: Information Paper (Information Paper) for general description of the construction, historical use, and location of the storage magazines on RVAAP.

b.) Due to documented and known storage operations and limited evidence that the operations may have caused a release, the Army has never thought it necessary to identify the Storage Magazines, including the igloos, as an AOC. However, detailed records of the past usage were not readily available.

c.) The Ohio EPA requested that the Army complete an investigation similar to a Relative Risk Site Evaluation (RRSE) to assess potential contamination at the igloos to help determine if they should become an AOC. The Army completed a sampling and analysis and visual inspection of certain igloos in 2010. The Army developed the study in conjunction with the Ohio EPA on the group of igloos known as the high priority igloos (HP Igloos). The determination of which igloos were considered high priority was based on their location, current use, or if they were identified as likely to be used in the future by the Ohio Army National Guard (OHARNG). Results of the study were never formally submitted to the Ohio EPA but were discussed in several subsequent meetings.

d.) Changes in management of the RVAAP Restoration Program occurred between Base Realignment and Closure Department (BRACD) and Army National Guard Directorate which led to changes to the approach of how to investigate and address the igloos, and potentially the AGMs, and whether or not there had been a release top make them an AOC.

e.) The Louisville District of the United States Army Corps of Engineers (USACE) was tasked to develop a strategy to determine which igloos should be sampled, how many should be sampled to determine if there was contamination or a release, if contamination or a release were evidenced at the igloos, and to propose a path forward. The USACE prepared a Work Plan identifying the strategy to sample the magazines (AGMs and Revetments were added to

the HP Igloos). The rationale and approach developed in the revised Work Plan was summarized into a presentation given to the Ohio EPA on 16 April 2014. The Ohio EPA provided comments/questions on the approach that would need to be considered/addressed in the Work Plan. Their response also included several questions and considerations that were used to refine the proposed approach. See Section 4.1 for copy of the email from the Ohio EPA regarding their comments.

f.) USACE revised the approach to address the Ohio EPA's comments. The revised approach was presented to Ohio EPA on 17 June 2014 at a meeting for multiple projects. During this meeting, the Ohio EPA and the Army discussed what was needed to move forward with the igloos. A general approach was suggested for the Army to provide more information regarding the historical use and other information about igloos using multiple lines of evidence. The multiple lines of evidence would include a historical review and a weight-of-evidence strategy to get the best approach to address the igloos. The Army was to review multiple sources of information including: sampling events in 2011; groundwater data; property historical data and archive files; common operations and practices records; regulatory history and environmental database search results; interviews; and other available information. Each line of evidence could assist in determining a common concept of the overall strategy. Additionally, one of the lines of evidence was for the ARNG to determine if the igloos could have a Land Use Control placed over them so that the Land Use would remain Commercial Industrial even in the absence of a calculated risk.

g.) On 17 July 2014, the Ohio EPA *"conducted a visual inspection of several igloo blocks"* and sent the Army a letter summarizing their observations. The letter stated that the Ohio EPA was concerned about igloos being locked which indicated that it was not clear as to why the igloos would be locked if they were empty. The letter also indicated that if the Army could not verify that the igloos had been emptied and "all stored materials were fully transferred" then a visual inspection of the interior of the storage magazines/igloos would be necessary to confirm they are empty. See Section 4.2 of the Information Paper for copy of the 17 July 2014 letter from the Ohio EPA.

h.) This Technical Memorandum summarizes the Army's findings of the research on the multiple lines of evidence and includes documentation used to support the findings, where available in the attached Information Paper.

i.) Based on the findings presented in this Technical Memorandum, no additional remedial activities are warranted for the ECMs or AGMs and these storage units should not be assessed further or considered to be AOCs. This recommendation was made after completion of the Historical Review and Risk Evaluation (HRRE) using the multiple lines of evidence approach.

The multiple lines of evidence approach was devised so that the Army could obtain historical records, conduct interviews, investigate other Installations/Depots with similar igloos, etc. As the HRRE was completed and more information was reviewed, it became apparent that there were many misconceptions and inaccurate information regarding what had been stored in the igloos and how there may still have materials stored inside. In addition, the preliminary data collected for the High Priority Igloos investigation was misinterpreted to assume that because chemicals were detected in the soils around a few of the sampled igloos was evidence of a release. This misconception is restated in a 3 July 2014 contact report between the former

(retired) Ohio EPA RVAAP Site Coordinator and two current Ohio EPA's Site Coordinators. An incomplete (report sent contained other portions of a draft letter from the Ohio EPA to the Army) contact report was provided by Nicholas Roope of the Ohio EPA to the USACE on 12 January 12 2015. See Section 4.3 in the Information Paper for excerpts of the contact report.

(2.) TASKS:

a.) In June 2014, the USACE Louisville District was tasked by the ARNG to complete an HRRE of the Storage Magazines on the Former Ravenna Army Ammunition Plant, Ravenna, Ohio (now known as Camp Ravenna) and to summarize the findings of the HRRE and include appropriate documentation in the Attached Information Paper. Paragraph 6 of this Technical Memorandum provides details of the places investigated, persons contacted and interviewed, and the references reviewed during the completion of the HRRE.

b.) USACE was also tasked with re-evaluating the soil/sediment/ and surface water data from the previously completed investigation of the High Priority Igloos study using current screening values and to include a summary of the investigation in the HRRE. See Section 5 of the Information Paper for summary data tables and other information from this investigation.

(3.) PURPOSE and OBJECTIVES:

a.) The intent of the HRRE was to present information regarding the Storage Magazines and recommendations of the path forward if the findings of the HRRE indicated additional analysis and investigation was necessary.

b.) The approach used to complete the HRRE is similar to the Preliminary Assessment (PA) and Site Inspection in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process; however, one objective of the HRRE was to determine whether or not the storage magazines are actually a site (i.e., *uncontrolled release*) that needs to be investigated under CERCLA as an AOC.

c.) The HRRE included review of the construction and design of the various types, historical use, inventory records, inspection reports, shipping practices, and an assessment of the soil data collected in 2011 at certain High Priority Igloos. The soil, sediment, and surface water data was collected under a previous Task (Project Order) and summary results are included in the Section 5 of the Information Paper.

(4.) SUMMARY OF FINDINGS OF HRRE:

a.) Number and Types of Storage Magazines – (See Sections 1, 2, and 3 of the Information Paper for additional details.)

(1.) Earth Covered Magazines: The design and construction of the Magazines dictated types of materials that could be stored in them. Originally, RVAAP was two facilities in 1941: Ravenna Ordnance Plant and the Portage Ordnance Depot Area. These two were

combined in 1943. The Plant Area ECMs were accessed and serviced by Railroad and the ECMs in the Depot Area were accessed and serviced using roads.
The ECMs were the only magazines used to store high-explosives. The Depot Area had 454 ECMs and the Plant Area had 236 ECMs, totaling 690.

(2.) Above Ground Magazines: The Plant Area had groups of other storage magazines called above-ground magazines (AGMs) used to store inert materials, supplies, fuzes/ boosters, and smokeless powder. If the inert material warehouses and the Type 2 AGMs are included, there are 98 AGMs. Previously, some warehouses were considered to be AGMs, although they were not designed to be magazines.

Only the AGMs in Area 3 (21 total) were used to house propellants. The other AGMs in Areas 2 (17 total), 4 (26 total), 6 (10 total), and 8 (24 total) were used to store inert materials or served as basic warehouses to store general supplies. Based on these findings, the 21 AGMs in Area 3 used to house propellants are the only AGMs that were used for materials that potentially could be a source for contamination. In addition, these 21 AGMs were constructed of steel and tile in a manner that would allow the propellants to be stored there. Although there were other buildings were constructed similarly, the other AGMs were used to store inert materials for the nearest Load Line or served as warehouses.

(3.) Revetments: The Army previously identified areas called Revetments as a type of Storage Magazine. There are 141 of these Revetments. There were two types of Revetments identified as Storage Magazines; Revetments (with barricades (50 total) and Revetments without barricades (91 total). Revetments were only identified in the former Depot Area, and individual Revetments were located between two ECMs. The ECMs in the Depot Area were serviced by roads. Materials stored in the ECMs were occasionally taken to various Revetments for staging before being transported. The Revetments without barricades were not used for staging of any type of explosive materials and were likely used to store empty pallets.

Revetments with barricades were used for staging of loaded pallets but not long-term storage. These are exterior areas that are unsuitable for storage but did have some protection in the event of an explosion. Department of War and Military Regulations in place at the time of the development of the Depot Area where the Revetments are located, did not allow outside storage of any munition or High Explosive (HE). The purpose of the Revetments was as a staging area for pallets to combine loads for transportation and a place where the trucks could be loaded. The Revetments are depicted on the original plans as pallets. Previously, it was thought that pallet staging areas were added to store materials returned at the end of WWII, however, this was not true. According to the findings of the HRRE, Revetments were never used for any type of storage, are not types of Storage Magazines, and should not be assessed further.

Table 1. Storage Magazines per Area/Block, number and type of Magazines in each, type of construction, mode of access and usage information.

Storage Group Area	Type of Design	Design for Storage/Use	Number	Storage/Use
Former Plant Area – Access by Railroad				
Area 1	Reinforced Concrete	ECMs	40	High Explosives/Nitroguanidine
Area 1A	Reinforced Concrete		80	High Explosives/Nitroguanidine
Area 2	Steel and Tile	AGMs	17	Inert Material and Equipment
Area 3	Steel and Tile		21	Smokeless Powder - Propellant
Area 4	Brick, Steel, and Tile		26	Inert Material and Equipment
Area 5	Reinforced Concrete	ECMs	44	High Explosives/Nitroguanidine
Area 6	Steel and Brick	Warehouses	10	Inert Material and Equipment
Area 7	Reinforced Concrete	ECMs	66	High Explosives/Nitroguanidine
Area 8	Wood and Sheet	Warehouses	24	Inert Material and Equipment
Wet Storage Area	Reinforced Concrete	ECMs	6	High Explosives/Nitroguanidine
			ECMs Total = 236	
			AGMs Total = 64	
			Warehouses = 34	
Former Depot Area – Access by Road				
Block A	Reinforced Concrete	ECMs	100	High Explosives/Nitroguanidine
Block B	Reinforced Concrete		95	High Explosives/Nitroguanidine
Block C	Reinforced Concrete		98	High Explosives/Nitroguanidine
Block D	Reinforced Concrete		100	High Explosives/Nitroguanidine
Block E	Reinforced Concrete		61	High Explosives/Nitroguanidine
			ECMs Total = 454	

Notes:
ECM – Earth Covered Magazines; AGM – Above Ground Magazines/Storage Units
High Explosives primarily Composition B (Comp B)

b.) Historical Usage – (See Section 10 of the Information Paper for a historical summary of the Ravenna Army Ammunition Plant prepared by Gail Harris of Vista Sciences Corporation)

(1.) Exact details of amounts stored in each Storage Magazine do not exist collectively. Some of the ECMs in the Plant Area still have their Ammunition Transfer Records (ATRs) remaining in them which indicate content up to the year 2000 when the last transfer of materials occurred and these ECMs were emptied. See Sections 6 through 9 of the Information Paper for documentation of former use, inspections, monitoring, etc. of the munitions storage magazines. Section 6 of the Information Paper includes a few examples of some of the ATRs. Anytime ammunition/materials were moved from an igloo, there was some type of ATR completed. The type of ATRs that were completed depended upon who was operating RVAAP and where the material was going. For example, if there was a box of nitroguanidine that was being destroyed at the Burning Grounds, the Explosive Safety Officer would likely complete the form and supervise the removal. The ATRs located and reviewed for this study were from 1979 to 2000. Prior to the ATRs, information was also maintained on Inventory Control Forms and other Department of War or Army forms. Photographs of storage and transfer of munitions from ECMs can be found in Section 6 of the Information Paper.

(2.) Information shows Storage Magazines were used off and on from 1941 to 1945 (August), then the plant production was shut down.

(3.) From 1945 to 1951, RVAAP was in the government's Operation Standby Program, which involved the maintenance and storage of equipment and ammunition for quick preparedness in case of future conflicts.

(4.) In the 1950's, the plant was used for reclamation and renovation of ammunition under government operations. Ammunition was sent to the arsenal for disposal or storage. Explosives were melted out and sold to munitions industries and the recovered metal parts were sold as scrap. Bombs and shells from other depots in the country were shipped to RVAAP for reclassification, dismantling of obsolete types, and general storage.

(5.) From 1951 to 1957, during the Korean Conflict, the Ravenna Arsenal produced shells and anti-tank mines. Production entailed obtaining shell casings produced off-site, loading them with explosives, and adding parts needed to have functional munitions.

(6.) From 1968 to 1971, during the Vietnam War, the plant produced shells, cartridges, and two kinds of primers.

(7.) In 1971, plant production ceased and RVAAP was returned to Standby Status again. Some renovation and demilitarization operations (the disassembly of ammunition) continued until 1984. In 1993, the plant was placed in permanent caretaker status with the BRACD Office taking management of the Installation Restoration Program (IRP). Section 6 of the Information Paper presents some of the ATRs that also state Inspections

and outcome of the inspections of the materials in the igloos. During the data gathering for the HRRE, very few Inspection Reports were located, however, other records refer to the routine inspections of the igloos and the Department of War/ Army had inspection requirements.

(8.) After the demilitarization operations in 1984, most of the material remaining in the ECMs in the Depot Area was nitroguanidine and the material remaining in the ECMs in the Plant Area was nitroguanidine and Composition B (Comp B). Nitroguanidine is not considered a HE; it is used as an explosive propellant, notably in *triple-base* smokeless powder. The nitroguanidine reduces the propellant's flash and flame temperature without sacrificing chamber pressure.

Comp B explosives are made from a mixture of TNT, RDX, and wax, such as 59.5 percent RDX, 39.5 percent TNT and 1 percent wax. Desensitizing agents are added. Composition B is used by the military in land mines, rockets and projectiles. Cast Composition B has a specific gravity of 1.65 and a detonation velocity of about 25,000 fps and is used as a primer and booster for blasting agents.

The TNT reduces the sensitivity of the RDX to a safe degree and, because of its melting point, allows the material to be cast-loaded. The blast energy of Composition B is slightly higher than that of TNT. Composition B is non-hygroscopic and remains stable in stowage. It has an extremely high shaped -charge efficiency and its color ranges from yellow to brown. Composition B has been used as a more powerful replacement for TNT in loading some of the rifle grenades and some rocket heads. It can be used where an explosive with more power and brisance is of tactical advantage and there is no objection to a slight increase of sensitivity. While no longer used in newer gun projectiles, some older stocks may be found with Composition B main charges.

(9.) Based on information in the ATRs and from former employees, much of the nitroguanidine was considered obsolete on 31 October 1988. Most of the material in the igloos on the Plant Area was the nitroguanidine. There were numerous drums of the nitroguanidine that had been consolidated from igloos where there was moisture detected in them. These drums were repackaged and resealed if they were deemed serviceable. If not, then the drums were taken to the Burning Grounds or elsewhere to be destroyed. Some of the ATRs in Section 6 of the Information Paper provide such details.

c.) Inspecting, Cleaning/Emptying, and Closure of the Magazines

(1.) Originally the Ravenna Plant portion was operated by Atlas Powder Company. The Atlas Powder Company had numerous procedures in place to insure the explosives and materials were handled safely and were secured at all times. Although operated by Atlas Powder Company, the Ordnance Plant was still part of the National Defense Program and was also under requirements to protect operations, personnel, and Plant property. Section 7 of the Information Paper) clearly demonstrates safety precautions and preventions needed to ensure the explosives were stored and handled properly. The Plant had numerous security Guards for instance that patrolled the facility. Ravenna Ordnance Plant (ROP) Manual of Safe Practices (ROP 866-15M-1-13, ORD -463) clearly demonstrates

safety precautions and preventions needed to ensure the explosives were stored and handled properly. Although the primary goal was to prevent accidents for safety purposes, it was imperative that all raw materials were preserved. Employees were trained to keep all work areas clean and to maintain raw materials to prevent loss of product. See Sections 6 through 9 of the Information Paper for documentation of former use, inspections, monitoring, etc. of the munitions storage magazines. Section 11 of the Information Paper provides additional information from some of the Army's and NG's current requirements and Regulations.

(2.) For the Depot portion of the RVAAP, early Army Regulations and later DOD Regulations, which were current at the time for the storage of explosives, were designed primarily to prevent personal injury or loss of property. The Army Regulations as well as the Industrial safety practices were followed. There were numerous War Department Manuals requiring adherence to specific regulations for the storage of any explosive materials. The Ammunition Inspection Guide Technical Manual, TM 9-1904 was one such manual used and available in 1944. The Ammunition Inspection Guide Technical Manual, TM 9-1904 was one such manual used and available in 1944. See Section 8 in the Information Paper for selected excerpts regarding requirements for inspections, cleaning, storage, safety, and other information for magazines.

(3.) The ECMs and the AGMs were designed and constructed following Department of Defense Regulations such as DODM 6055 09-M and currently in Department of Army Pamphlet 385-64. These documents also dictate requirements for the Quality Assurance Surveillance Specialist (QASS) who would complete the routine inspections of the ECMs. The inspections and monitoring of the AGMs were not regulated to the extent of the ECMs, which were designed to store dangerous and explosive materials and had inherent safety factors such as the reinforced concrete walls in case of an explosion. The current QASS is an employee of the Army National Guard and completes inspections of munitions used and maintained by the OHARNG per current Regulations and according to the Draft Explosive Site Safety Plan (ESSP). The ESSP and details of this document are not available to the Public due to security reasons.

(4.) Based on information gained from discussions and Army/DOD Regulations, each of the ECMs were under guard and were periodically inspected. The mandatory Inspections were completed by DOD personnel as well as Contractors who were Certified Explosive Experts (meeting DOD requirements). Current DA and DOD Regulations require that areas where HE are stored are under guard and continuously monitored and inspected by a QASS. If the ECMs had explosives in them, the DOD and Army Regulations mandate that any HE in ECMs be kept under guard at all times. From 1993 until emptied, the ECMs were maintained, inspected per Army Regulations, and monitored.

(5.) Beginning in the year 2000, the Golden Cargo Transportation Unit from McAlester Army Ammunition Plant Defense Ammunition Center, of the Joint Munition Command's Mobile Ammunition Renovation, Inspection, and Demilitarization (MARID) Team (McAlester, Oklahoma) began moving and compiling materials from ECMs on the former Plant area that were serviced by railroads to the former Depot side that had been serviced by roads. Occasionally, some of the materials may have been shipped immediately off of RVAAP to McAlester or to other facilities like Milan Army Ammunition Plant in Milan,

Tennessee. Once an ECM was emptied, a Final Inspection was completed and a Final Inspection Report was issued. Following inspection and certification that they were empty, the doors of each ECM were closed and a ball seal similar to what is used in the transportation industry was placed on the door. Ball seals are not intended to prevent entry but to indicate when tampering had occurred. The Ball seals were placed on the ECMs by Army Safety Experts and a QASS. Each of the Ball seals had a unique serial number which was recorded on the Closure Report.

Over the next two and half years, the Golden Cargo Unit MARID Team, with the occasional assistance of Ohio Army National Guardsmen, emptied the ECMs on the former Plant side of the Installation, inspected them, and sealed them. Once the ball seal was attached, the QASS also completed a Closure Report. It is believed that this was done to ensure that ECMs that the Ohio Army National Guard would use or needed to use immediately, were emptied first; but this is speculation based on conversations with Jay Chancellor (pers. com, Work Leader of the MARID Operations at McAlester). See Section 9 of the Information Paper for the first and last shipping papers from the McAlester MARID Team.

(6.) After materials were moved from the Plant ECMs to the Depot ECMs, the Golden Cargo Unit MARID Team began emptying the Depot ECMs. The first recorded shipment of the materials from the ECMs on RVAAP by the Golden Cargo Unit MARID Team occurred in August 2003 and the last shipment recorded was in December 2004. According to the last shipment records in 2004, a total of 431 ECMs had been emptied and cleaned. These account for most of the ECMs in the former Depot area. The ECMs in the former Plant Area had already been emptied and the materials they held were moved so that no shipping records exist. There are records that indicate that these ECMs were inspected and were sealed with a ball seal.

(7.) According to Tim Morgan (Ohio Army National Guard, State Environmental Supervisor) LTC Tom Tadsen, a former Commander of Camp Ravenna, had many of the ball seals removed and replaced with padlocks or similar devices (pers.com.). The ECMs were locked to prevent trespassers from entering the ECMs. Since these ECMs were formally certified as empty and cleaned, there was no documentation required to remove the ball seals or replace them with locks. Munition storage in the ECMs by the Ohio Army National Guard is monitored and highly regulated as well as documented in the Explosive Safety Site Plan as required under DOD and Department of Army Regulations.

(8.) During the demilitarization process ending in 1984, propellant remaining in a few (approximately 3 to 4 of the 21) of the Area/Group 3 AGMs was removed. Some of the propellant was used in the actual demilitarization process and destroyed and the rest was shipped off of RVAAP. At the end of 1984, all of the AGMs in Area 3 were emptied, inspected, and certified ready for use as above ground storage units (warehouses) or for use as needed. According to Tom Chanda, a former employee of the Olin Corporation, the company that maintained the Plant from 1982 to 1993, there were only a few of the Area 3 AGMs that actually had been used to store propellants. At the time when the Olin Corporation maintained the facility, only the AGMs in Group 3 were monitored, inspected, and maintained following DOD Safety Munitions Storage Guidelines by the DOD and the Explosive Safety Officers of the Olin Corporation. The remaining AGMs were maintained per DOD Standards (i.e., painted, cleaned, etc.) as unheated warehouses/storage units.

When the demilitarization process began in 1980's, all the AGMs were inventoried, inspected, and cleaned. The Area 3 AGMs that were in use during the demilitarization process were inspected and were very clean. The propellant was intact. These AGMs continued to be inspected and monitored to ensure that the propellant was intact and sealed until all the propellant was removed.

d.) Current Usage of Earth Covered Magazines – (This information was primarily obtained from discussions with Tim Morgan (OHARNG) and from the Draft ESSP.)

(1.) Except for a few of the ECMs on the facility, all of the ECMs are now deemed as emptied/abandoned and are no longer in use. No materials from former usage or production remain in any of the ECMs. Several of the ECMs also serve as Tornado Shelters.

(2.) Four existing ECMs located in Block C, Row 7 (007C1 – 007C4) are used as Conditionally Exempt RCRA storage units (no RCRA permit required as long as maintained and compliant with RCRA Regulations). These ECMs are inspected and maintained. These ECMs are designated to store munitions as hazardous waste that is discovered during construction, restoration, or other projects that occur on Camp Ravenna.

The following information regarding current use of the ECMs to store explosives and other ammunition do not include the specific details as to the amount and location. This information cannot be released due to security reasons. However, there is no relationship between the current use of specific ECMs and the former DOD usage; therefore, the current use is not relevant to whether or not the ECMs should be assessed as an AOC.

Current usage of the ECMs by the OHARNG is under supervision of the OHARNG Safety Office and is part of a written Explosive Safety Compliance Program. The Regulations that control current use of the ECMs, their inspections, and other requirements are as follows:

a. DOD 6055.09-M, DOD Ammunition and Explosives Safety Standards, 29 February 2008, Administratively Reissued 4 August 2010.
b. AR 385-10, The Army Safety Program, 23 August 2007, Revised 14 June 2010.
c. DA Pam 385-64, Ammunition and Explosives Safety Standards, 24 May 2011. NGR 385-10, 2007.
d. FM 5-19, Composite Risk Management, August 2006.

(3.) The OHARNG will be refurbishing several existing ECMs so that they meet current DOD criteria as outlined by DOD Manual 6055.09-M-V3. These structures will be designated to store training ammunition to support training ranges on Camp Ravenna, storage of materials for training at outside facilities, and a few will be used by the Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATFE).

e.) Current Usage of Above Ground Storage Units (This information was primarily obtained from discussions with Katie Tait and Tim Morgan of the OHARNG and from the Draft ESSP.)

(1.) The AGMs are only located on the former Plant Area in Areas 2, 3, 4, and 8 (see Table 1). The AGMs in Areas 6 and 8 have always been designated as Inert Storage and still are used as such. From a historical perspective, sometimes the storage warehouses in Area 6 are included as AGMs but should not be considered as a magazine since they are constructed from steel and brick.

(2.) The AGMs in Area/Group 2 are currently used for multiple purposes:

- The Regional Training Institute (RTI) Engineer School uses the Area and some of the AGMs/Buildings for their classes and instruction on earthmoving activities.
- One area is used for minor maintenance activities on Army equipment associated with the RTI Engineer School. These activities are conducted in an Army clamshell style building and not within an AGM.
- Remaining AGMs are used as a Tactical Training Base during heavy training months, typically in the spring and summer months. General uses of the AGMs as the Tactical Training Base consist of use as barracks and meeting facilities.

(3.) The AGMs in Areas/Groups 3, 4, and 8 are used for storage of military equipment.

f.) 2010 to 2012 Investigation of the High Priority Igloos - (Visual Inspection, Sampling, and Analysis Study) (See Section 2.1 and 5 of the Information Paper for more details and summary data tables from this study.)

(1.) USACE completed a study of certain igloos (ECMs) identified by the Ohio Army National Guard as High Priority Igloos. Sixty-eight High Priority Igloos were identified as those igloos that were currently being utilized or were planned to be utilized by the Ohio Army National Guard in the near future. Included in the study were selected igloos in the following areas: B Block, C Block, D Block, Group 1 and 1A Magazines, and Group 7 Igloos.

(2.) The purpose of the study was to assess chemical contamination in or around igloos selected to be sampled based on results from a visual inspection, historical information, location within a given area (i.e., proximity to a road), and other pertinent information. Once this information was obtained, the results would be utilized to help the Army determine if the ECMs (igloos) should be further investigated as an Area of Concern (AOC) as a site where a release per CERCLA had occurred. Igloos selected for sampling were those considered to have the greatest potential to be contaminated based on current conditions assessed during the visual inspections.
It was hypothesized that bulk materials (i.e., explosives, propellants, etc.) formerly stored in the igloos may have leaked from their packaging during transfer to and from the igloos, and or during storage within the igloos. Materials that could have leaked during transfer may have impacted the loading dock platforms and/or ground surface areas located at the front of each Igloo. Materials may have leaked within the igloos during storage and then escaped the structures via condensate collection systems located on each side and within each Igloo. The collection systems drain from the structures via portals located on each

side of the structure doors. Effluent from the drain portals typically empty onto the ground surface immediately below and/or adjacent to the drains. Some drains could have carried carry contamination to larger earthen storm drains.

(3.) The study was completed using a phased-approach. Initially, the High Priority Igloos were visually inspected to determine their status and to assist in identifying which of them, if any, appeared to be contaminated (i.e., showed signs of former spills or leaks). Once visual inspections were completed, results were then considered with the historical usage, documented spills or releases, and documented Igloo repairs to select igloos that appeared to have the greatest likelihood to have contamination if it was present.

(4.) Included in the sampling portion of the study were select Igloos in the following areas: B Block, C Block, D Block, Group 1 and 1A Magazines, and Group 7 Igloos (Table 2). The High Priority Igloos were grouped together into sampling units based upon their proximity to each other. There were no more than 4 igloos in each grouping. One igloo with the greatest probability of contamination from each group was chosen to be sampled. This selection was based on results from a visual inspection of the igloos compiled with other historical information. The only exceptions to using the visual inspection and historical results to select for sampling were for Igloos 6C1 through 6C5, which were planned to be sampled. The rationale used to select igloos to be sampled is presented in Table 3. Summarized results from the visual inspection are included in the Information Paper. A few of the specific details (i.e., copy of a completed Igloo Inspection Form) and example photos taken during the visual inspection are provided in Sections 3 and 6 of the Information Paper for documentation purposes only.

(5.) Surface soil, sediment and surface water were sampled to assess potential impacts from historical use of the igloos. Due to the munitions items historically stored in the HP Igloos, all samples collected were analyzed for explosives, propellants, and metals. Additionally, per request of the Ohio EPA, all samples were analyzed for Pentachlorophenol, an acid extractable Semi-volatile Organic Compound (SVOC), which might have been used as a lumber preservative for munitions storage boxes or other items that were stored in the igloos. According to Anthony Hampton (McAlester Operations Chief), wood used to separate and stack explosives/munitions was not treated wood. Additionally, Tom Chanda (former Olin Corporation employee) stated that if any material was spilled or noted on the wooden spacers and stackers, the wood was immediately removed and destroyed. A majority of samples were also analyzed for polychlorinated biphenyls (PCBs) which might have been in paints used on the doors and other components of the igloos, although no available information indicated this type of paint had been used on the igloos. Neither pentachlorophenol nor PCBs were identified in the soil, sediment, or surface water samples collected and assessed during the HP Igloo investigation.

Table 2. High Priority Igloos and their Reported Use or Proposed Future Use in 2010.

Area	Igloo Designations	Reported Use/Future Use by the OHARNG	Number
B Block	6B1 through 6B4	Tornado Shelter	4
	7B1 through 7B4	Tornado Shelter	4
C Block	1C1 Through 1C7	Tornado Shelter	7
	3C7	OHARNG Regional Training Institute	1
	3C10 through 3C12	ATFE	3
	3C14	OHARNG Regional Training Institute	1
	6C1 through 6C5	Future Ammunition Supply	5
	7C1 through 7C4	Used by MMRP Contractors	4
D Block	6D1	Used for M19 Range	1
	7D6 through 7D11	Temporary Unit Storage	6
	5D1	Tornado Shelter	1
	5D2	Museum Storage	1
	3D1 and 3D2	Tornado Shelter	2
	7D1 through 7D3	Tornado Shelter	3
Group 1 and 1A Magazines	F37	Scheduled for demolition FY12 for construction of modified Record Range	1
	J66 and J67	Potential Demo for Line-of-Sight Small Arms Range Training	2
	K75 and K76	Potential Demo for Line-of-Sight Small Arms Range Training	2
	L84 and L85	Potential Demo for Line -of-Sight Small Arms Range Training	2
	Q128 through Q131	Tornado Shelter	4
	Q132 through 135	Tornado Shelter	4
	Q136 through Q139	Tornado Shelter	4
	P117 through P127	Tornado Shelter	11
Group 7 Igloos	HA305 and HA306	Tornado Shelter	2
	HB311 and HB312	Tornado Shelter	2
		Total	77

Table 3. High Priority Igloos selected for Sampling and Analysis and the Rationale for their Selection.

Area	Description Igloo Group	Selected Igloo for Sampling	Rationale for Selection
B Block Igloos	6-B-1 thru 6-B-4	6B4	6B4 was selected based on photographs. 6B2, 6B3, and 6B4 were in similar condition.
	7-B-1 thru 7-B-4	7B3	7B2 and 7B3 both had water present in scuppers. The drains in 7B2 had potential blockage from water exiting the scuppers. 7B3 did not have this blockage and had leakage from walls in the middle of the igloo. 7B3 was selected due to its current condition over 7B1.
C Block Igloos	1-C-1 thru 1-C-4	1C3	Selected based on the presence of water at the head wall and scuppers.
	1-C-5 thru 1-C-7	1C5	All of these igloos had water present in the igloo with various reasons to select each one as having the highest probability of being contaminated. 1C5 was selected because of red staining on the floor.
	3-C-7	3C7	C37 was selected, because it was not grouped with any other igloos.
	3-C-10 thru 3-C-12 and 3-C-14	3C11	3C11 was selected because it had the worst visual exterior cracking.
	6-C-1	6C1	Selected all igloos 6C1 thru 6C5
	6-C-2	6C2	Selected all igloos 6C1 thru 6C5
	6-C-3	6C3	Selected all igloos 6C1 thru 6C5
	6-C-4	6C4	Selected all igloos 6C1 thru 6C5
	6-C-5	6C5	Selected all igloos 6C1 thru 6C5
	7-C-1 thru 7-C-4	7C3	Selected because it had the most interior moisture.
D Block	3-D-1 thru 3-D-2	3D1	3D1 and 3D2 were both clean and dry on the interior. 3D1 had straw and twine present inside. 3D1 was selected based on the unique presence of these items in the igloo.
	5-D-1 thru 5-D-2	5D1	5D1 was selected due to the presence of moisture in the igloo. The interior of 5D2 was inaccessible.
	6-D-1	6D1	Selected since not grouped with any other igloos.
	7-D-1 thru 7-D-3	7D3	7D3 was selected since wild life (a snake) was found in the igloo interior.
	7-D-6 thru 7-D-8	7D7	7D7 was selected since both scuppers had water present.
	7-D-9 thru 7-D-11	7D9	7D9 had both floor and toe drains present, which may have provided additional pathways for potential contamination to spread from the igloo.

F Block	F-37	F37	Selected since not grouped with any other igloos.
Group 1 and 1A	J-66 and J-67	J67	J67 was selected since there is water seepage, had dunnage present in the igloo interior, and historically stored Comp A5.
	K-75 and K-76	K75	K75 was selected due to seepage and moisture presence in scuppers.
	L-84 and L-85	L84	L84 was selected due to the visual inspection of the exterior looking significantly worse than L85.
	P-117 thru P-120	P118	P118 was selected based on the presence of moisture in the igloo, and that Comp B was historically stored in it.
	P-121 thru P-124	P122	P122 was selected based on the majority of the floor being moist and that Comp B was historically stored in it.
	P-125 thru P-127	P126	P126 was selected due to the presence of calcification on the walls indicating the presence of a seep, and that Comp B was historically stored in it.
	Q-128 thru Q-131	Q131	Q131 was selected since moisture was present and historically stored Comp B.
	Q- 132 thru Q-135	Q133	Q133 was selected since moisture and dunnage were present in the igloo, a strong solvent smell was present in the igloo, and Comp A5 was historically stored in it.
	Q-136 thru Q-139	Q136	Q136 was selected since an ATR card was found in the igloo which showed that Comp B was stored there. The ATRs also showed that Comp B was stored in Q137 and Q138, however it is unique that the ATR card was found in the igloo interior during inspection.
Group 7 Igloos	HA-305 and HA-306	HA306	H306 was selected since the interior of H305 was inaccessible.
	HB-311 thru HB-312	HB312	HB312 was selected due to presence of moisture and dunnage in igloo.

These two items; Pentachlorophenol (wood preservative used from 1950's to 1980's) and PCBs were added at the request of the Ohio EPA, but are not based on any known information about the type of wood or paint used. It is very unlikely that treated lumber was used inside of the igloos. The dunnage was reused within the igloos. Due to costs and availability, untreated lumber was used as the primary dunnage (spacers and stacking bars) for the boxes of materials inside of igloos. Most of the lumber, if not all that was used inside the igloos, remained there and only the boxes were removed and placed on pallets. The pallets may have been comprised of treated wood but were not used or stored for bulk storage inside of the igloos. The wood used to stack and separate boxes inside the igloos was never intended for outside storage and therefore would not have been treated. This is further supported by the fact that dunnage currently remaining in a few of the igloos assessed during the visual inspections is not treated. None of the dunnage remaining in the ECMs is treated lumber.

(6.) In January of 2011, the USACE completed initial sampling of five ECMs in Block C. Initial chemical results were shared with and discussed with the Ohio EPA. These results were used to design the rest of the study and to improve the Work Plan for sampling the HP Igloos. The Work Plan was not a formal submittal but instead, a Technical Memorandum prepared by USACE and approved by Mark Patterson, former BRAC Coordinator for Ravenna.

(7.) Thirty of the 77 High Priority Igloos were selected to be sampled to determine if they were contaminated. The selection of which High Priority Igloos was based on the rationale described earlier and the number of High Priority Igloos was based on the number of proximally- based groupings for the Igloo Areas. Table 3 lists the 30 High Priority Igloos that were sampled. Additional samples were taken at three of these igloos where there were interior conditions noticed that may indicate the presence of chemical contamination.

(8.) General Information for each Media Sampled at High Priority Igloos:

a.) Surface Soil – 30 Samples Collected

On 26 January 2011 and 12 September 2011 through 16 September 2011, 30 primary incremental samples (IS) were collected from the surface soil between the Igloo head wall and the road or railway. The IS samples were collected by advancing a slotted 7/8" diameter soil probe 12 inches below the surface and extracting the sample into a plastic bag liner contained in a bucket. Thirty (30) aliquots of soil were collected at each sample area in a systematic random manner. During the week of 12 September 2011 through 16 September 2011, three (3) primary discrete samples were collected from the surface soil for VOC analysis. No indications of contamination were observed on the surface soil to bias the collection location of the discrete VOC samples. Discrete VOC samples were collected by using a shovel to dig down 12" into the ground, then using a Terra Core sampler to collect 5 gram plugs of undisturbed soil and placing them into the preservative vials provided by the analytical laboratory. All surface soil samples that were planned to be collected were accessible and collected.

b.) Sediment – 29 Samples Collected

During the week of 12 September 2011 through 16 September 2011, 29 primary IS samples were collected from the sediment drainage paths along the obvious downstream drainage path up to 70 feet downstream of the igloos or until meeting a larger storm drain. The IS samples were collected by advancing a slotted 7/8" diameter soil probe 6 inches below the surface and extracting the sample into a plastic bag liner contained in a bucket. Thirty (30) aliquots of soil were collected along the bottom of the drainage path in a systematic random manner. During the week of 12 September 2011 through 16 September 2011, three (3) primary discrete samples were collected from the sediment drainage paths for VOC analysis. No indications of contamination were observed in the drainage paths to bias the collection location of the discrete VOC samples. Discrete VOC samples were collected by using a shovel to dig down 6" into the ground, then using a Terra Core sampler to collect 5 gram plugs of undisturbed soil and placing them into the preservative vials provided by the analytical laboratory. All sediment drainage path samples that were planned to be collected were accessible and collected except for one. This was at igloo Q136, where flooding prevented access to the drainage path for sampling.

c.) Surface Water – 10 Samples Collected

During the week of 12 September 2011 through 16 September 2011, a total of 10 discrete surface water samples were collected in the sediment drainage paths. Surface water was present at the following nine igloos: 6B4, 6C2, 6C4, F37, J67, K75, L84, P126, and Q133. All other igloos were not sampled due to a lack of sufficient surface water to sample except for igloo Q136, where the drainage paths were flooded. Due to the flooded area being much larger than the individual igloo, the water may have been impacted by sources other than the igloos; therefore, no surface water sample was collected. Samples were collected by submerging an unpreserved container, either a beaker or amber glass jar, into the surface water. The container was slowly filled with water. The sample was then slowly poured into the various preserved and unpreserved containers provided by the analytical laboratory minimizing bubbles and volatilization.

(9.) The following numbers of samples were collected for the three media sampled:

- 30 IS surface- soil samples,
- 29 IS sediment samples, and
- 10 surface water samples.

(10.) As stated previously, this HRRE and the High Priority Igloo Sampling and Analysis Studies were completed to assist in the determination of whether or not the chemical contamination related to a release (per CERCLA definition) had occurred at the ECMs from former use. As in a Site Inspection (SI), the focus of the investigation is to identify if contamination is present, and if so, continue investigations such as with a Remedial Investigation. In addition, the purpose of these investigations has been to determine if the ECMs (and the AGMs, if deemed contaminated) should be considered an AOC. The chemical results of the High Priority Sampling and Analysis were evaluated using the risk-based approach used similarly in SIs completed for RVAAP to identify contamination.

However, because the ECMs were only used for storage purposes, were never used for production, were regulated and monitored during use, and have never been shown to be a release on other Installations where the ECMs were used strictly for storage, the results of the chemical analysis was assessed to a greater degree than normally done in an SI to determine if there was any chemical contamination. Risk-based screening criteria were used to identify if there were chemicals that would require additional analysis and if so, were they in concentrations indicative of a release.

Previously completed remedial investigations consistently show low levels of chemicals may be detected in various media where biased sampling is completed but are not of concern since their concentrations are not great enough to cause a risk. Therefore, considering the past use of the ECMs and no evidence of a release or area to focus the sampling, it would not be appropriate to assume any chemicals detected that exceed screening criteria represent a release and are indicative of contamination. Additionally, the ISM samples were taken from very small areas and were not consistent with normal sample Decision Units or Exposure Areas. Once chemicals that exceeded the screening criteria were identified, these chemicals and their distributions/concentrations were further assessed using a Weight of Evidence Evaluation.

(11.) The screening process used to evaluate results from the chemical analysis in HP Igloo study is briefly explained below:

a.) Identification of Chemicals Exceeding Background and Essential Nutrients

A chemical detected in at least one sample for each media was retained for comparison to background and to determine if it was an essential nutrient. Therefore, only detected chemicals in surface soil samples were considered for evaluation in the surface soil. These chemicals may not represent chemicals related to historical operations within the AOC. The presence of chemicals in very low concentrations is generally not indicative of a release, but this also depends upon their distribution and occurrence at a site as well as other factors. Therefore, any chemical that is detected was assessed. The purpose is to determine the presence or absence of chemicals that could be site-related and occur at concentrations greater than naturally-occurring levels or other screening criteria.

The initial step follows the three steps outlined in the Facility Wide Cleanup Goal (FWCUG) Report (SAIC 2010). One of the steps involves a screening process where the frequency of detection is used to evaluate whether or not the chemical is detected in 5 % or more of the sample results. However, for this investigation, no frequency-of-detection screening was performed because fewer than 20 samples were available for any of the datasets and frequency of detection screening is not applied to ISM samples.

(1.) Background Screening

The facility-wide background concentrations for naturally-occurring inorganic chemicals were originally published in the *Phase II Remedial Investigation Report for Winklepeck Burning Grounds* (USACE 2001b) and

summarized in the FWCUG Report. Normally, inorganic chemicals detected above background screening values (BSVs) or having no BSVs were retained. In this Investigation, the BSV was used as a screening value if it was less than the FWCUG. This is a conservative approach to ensure that potential risks associated with certain inorganic chemicals are not underestimated.

(2.) Screening of Essential Human Nutrients

Chemicals considered essential nutrients (e.g., calcium, chloride, iodine, iron, magnesium, potassium, phosphorous, and sodium) are a fundamental component of the human food supply. Essential nutrients detected near or below their Recommended Daily Allowance (RDA) screening levels were eliminated from additional analyses.

b.) Determination of Chemicals Needing Additional Analysis

After the initial screen was completed to remove chemicals with concentrations less than background and to remove chemicals that are essential nutrients, for each media, the next step is to determine which chemicals occur at concentrations that exceed screening criteria for each media and specific receptors. This step involves screening the detected chemicals that were not eliminated during the background and nutrient screen against Facility-wide Cleanup Goals in the FWCUG Report. The chemicals that exceed the FWCUGs may pose potential health risk to receptors resulting from exposure while using the High Priority Igloos. Methods for the screening of these chemicals can be found in FWCUG Report (USACE 2010a) as described below.

The proposed approach for risk-based decision making at RVAAP is a streamlined process using the FWCUGs that were developed from RVAAP-specific Human Health Risk Assessment methods (FWHHRAM USACE 2005). Descriptions of the approach (i.e., receptors, exposure parameters, etc.) as well as the actual FWCUGs are presented in the FWCUG Report (SAIC 2010). The FWCUG Report contains calculated FWCUGs and guidance for their application to accelerate the risk assessment process.

For the determination of the contamination in the HP Igloo study, all chemicals with concentrations greater than background and that were not essential nutrients were screened against their specific FWCUG at the 1.0×10^{-6} cancer risk level and non-carcinogenic risk Hazard Quotient (HQ) of 0.1 for each of the following receptors: the Residential Farmer Adult, Residential Farmer Child, and the National Guard Trainee. If there are no FWCUGs developed for the particular chemical, then the USEPA Regional Screening Levels (RSLs) should be used using the same risk goal and hazard quotient of 1×10^{-6} and HQ of 0.1.

The steps listed below were followed to determine if any chemicals detected at the High Priority Igloos exceeded a screening level:

- The FWCUGs developed for the Residential Farmer Adult and Child Receptors and the National Guard Trainee were identified for each chemical that passed

the background and nutrient screen. If no FWCUG was available, then the USEPA's RSL for that chemical was used. If neither the FWCUG nor the RSL was available, then a surrogate value (FWCUG and if not available then an RSL value for a chemical similar to the given chemical) was used.

- The FWCUGs at the 1.0 X 10^{-6} carcinogenic value and the non-carcinogenic hazard value termed Hazard Quotient (HQ) of 0.1 were used for this investigation.

- All carcinogenic risk and non-carcinogenic hazard values for each chemical for the Adult and Child Residential Farmer receptors and the National Guard Trainee receptor were assessed. In addition, the carcinogenic and non-carcinogenic Industrial RSL was used for comparison along with the FWCUG for the National Guard FWCUG to assess whether or not the High Priority Igloos could be used by the OHARNG without restrictions as defined in the Army's February 2014 Technical Memorandum: Land Uses and Revised Risk Assessment Process for Ravenna. Using the most stringent criterion is conservative but was deemed necessary to identify if the High Priority Igloos could be used by the OHARNG without restrictions or limitations.

- A comparison of the selected FWCUG to each of the detected chemicals for each media sampled for each High Priority Igloo was completed. The value determined for each High Priority Igloo that was identified as a detected chemical was considered as the Exposure Point Concentration (EPC). The chemical was determined to be a chemical requiring additional analysis if the EPC exceeded the screening value for the Adult Resident Farmer, the Child Resident Farmer, or the National Guard Trainee/RSL for either one of the 1.0 X 10^{-6} carcinogenic value and the non-carcinogenic risk value termed Hazard Quotient (HQ) using the 0.1 risk value.

- The next step was to determine which of the chemicals have potential to cause a risk and therefore need further evaluation to determine if they represent contamination. This step involves a comparison of the concentrations of the chemical compared to that of the chemical concentrations to specific FWCUGs. However, unlike the initial comparison, this step involves a comparison of the chemical concentration to different risk levels and potentially for different receptors.

- The remaining chemicals (greater than background, were not identified as an essential nutrient, and exceeded a FWCUG) were further assessed to evaluate their concentrations, distributions, and whether or not they might be considered indicative of a release, which could mean the HP Igloos should be investigated further. This final screening step involved a less stringent risk value but takes into account the potential for additive effects. To account for the potential additive effects from exposure to multiple chemicals or exposure to multiple chemicals that can cause the same effect (e.g., cancer) or affect the same target organ, a "Sum of Ratios" (SOR) approach was used. Ratios of the EPC to the FWCUGs for all concentrations of the remaining chemicals that affect multiple organs or carcinogens were added together respectively. The SOR is

determined by adding each of the chemicals ratios of the FWCUGs for carcinogens (at the 1 X 10^{-5}) or non-carcinogens that affect the same target organ/system or HQ = 1.0) together and then comparing the total sum. If the total sum for carcinogenic compounds collectively or the non-carcinogenic chemicals exceed 1.0, then the chemicals are further assessed using a weight of evidence approach to truly assess their occurrence and distribution relative to whether or not they actually represent contamination. In addition, when there is no specific target organ effect available, this chemical was included in calculations of all non-carcinogenic effects. Additional information on the screening process can be found in the FWCUG Report.

The determination of the chemicals that require a Weight of Evidence evaluation is as follows:

- The FWCUGs developed for the Resident Farmer Adult and Child Receptors and the National Guard Trainee/Industrial Work RSL were selected for each chemical at the 1 X 10^{-5} carcinogenic value and the non-carcinogenic risk value termed Hazard Quotient (HQ) using the 1 risk value were identified for each chemical for each media.

- All carcinogenic and non-carcinogenic values for each chemical for all receptors were determined.

- The critical effect and target organ(s) for each of the non-carcinogenic hazard values were identified for each chemical and each media.

- A comparison of the selected FWCUG to the EPC was completed. The EPC was the concentration determined for the samples collected from each media at each High Priority Igloo.

- All non-carcinogen's chemical-specific concentrations were compared to their perspective target risk FWCUG. The ratios of chemicals that affect similar organs were summed.

- All chemical-specific concentrations of chemicals considered carcinogenic were compared to their target risk FWCUG. The ratios of all carcinogens were summed.

- The chemical(s) were identified as needing further analysis d if the EPC exceeds the most stringent screening value for either one of the 1 X 10^{-5} carcinogenic value and the non-carcinogenic Hazard Quotient (HQ) of 1. The Sum of Ratios for all carcinogens and all non-carcinogens that may affect the similar organs must be less than or equal to 1.0 as well. If the SOR for all carcinogens and all non-carcinogens (that may affect the similar organs or do not have a specific target organ indentified) are greater than 1.0 then the chemicals contributing at least 5% to the sum are considered needing a Weight of Evidence Evaluation.

(12.) The list of chemicals detected for each of the various media and HP Igloo are not discussed in this Technical Memorandum. Since the primary purpose of this Technical Memorandum was to summarize findings of the HP Sampling and Analysis Investigation for the HP Igloos, only the results of the last screen (determination of which chemicals need a Weight of Evidence Evaluation) are not discussed here. Chemicals determined for each Media Sampled for each group of chemicals analyzed (i.e., SVOCs or explosives) are summarized in tables in the Information Paper. No chemicals that require a Weight of Evidence evaluation were identified in any of the 10 surface water samples collected for the HP Igloo investigation. No Explosives/Propellants, PCBs, Pesticides, or VOCs were identified as requiring additional evaluation using the Weight of Evidence approach in surface soil or sediment. No metals were identified in sediment that needed additional analysis using the Weight of Evidence approach. In summary, the following lists of chemicals (by media) were identified as chemicals that need to be evaluated further in a Weight of Evidence Evaluation to determine if they represent contamination or a release at the HP Igloos. See Section 5 of the Information Paper for summary data tables.

a.) The following are list of the chemicals identified in surface soil that need additional evaluation:

- Metals: Arsenic
- SVOCs: Benzo(a)pyrene

b.) The following chemicals identified in dry sediment that need additional evaluation:

- SVOCs: Benzo(a)pyrene

(13.) Weight of Evidence Evaluation by Media and Chemical

a.) Soil:

No Explosives/Propellants, PCBs, Pesticides, VOCs were identified as chemicals that required additional evaluation using a Weight of Evidence approach. Arsenic was the only metal in soil that exceeded the 1.0×10^{-6} screening criteria and was only in one sample out of 30 taken and assessed (Table 4). The concentration was 31.2 mg/kg in soil sample from Group 7, Igloo HB 312. The background concentration for arsenic at RVAAP is 15.4 mg/kg for surface soil and 19.8 mg/kg for subsurface soil. This Igloo was serviced by Railroad. This value detected in such a small IS sample from Group 7 Igloo HB312, does not appear to represent a release from the Igloo. The background study completed at Ravenna showed arsenic was found in all the samples and concentrations were variable. For comparison purposes, the RSL for Industrial soil is 30 mg/kg. Additionally, arsenic or products containing arsenic were not stored in the igloos. For these reasons stated above and because arsenic is found throughout the Installation, this single exceedance of arsenic does not indicate contamination at this Igloo.

Benzo(a)pyrene was the only SVOC identified in surface soil in any of the High Priority Igloos sampled. Benzo(a)pyrene, also known as polycyclic aromatic hydrocarbons (PAHs) are ubiquitous and are commonly found in most soil samples that are collected near road, railroads, and parking lots. They are products of

incomplete combustion or burning of organic materials. The sample concentration that exceeded the screening criteria was 5.4 mg/kg and was found in Group 7 Igloo HA-306. This Igloo was serviced by railroads. The concentration that exceeded screening criteria is similar that of New Jersey's background value for benzo(a)pyrene of 5 mg/kg.

Based on the lack of any chemicals relative to what was stored in the igloos and what was assessed in the study for the surface soil, there is no indication of a release. Chemicals that were detected in soils around the HP Igloos were not indicative of a release. It is more likely these two chemicals are attributable to other sources, are naturally occurring (i.e., arsenic) or are ubiquitous (i.e., benzo(a)pyrene and are not relevant to use of the HP Igloos as storage units.

b.) Dry Sediment (Soil)

No Explosives/Propellants, Metals, PCBs, Pesticides, or VOCs were identified as chemicals requiring additional analysis in sediment. Since this was dry sediment soil screening values were used. Benzo(a)pyrene was the only SVOC identified in sediment in any of the HP Igloos sampled. Benzo(a)pyrene and many similar chemicals known as polycyclic aromatic hydrocarbons (PAHs) are ubiquitous and are commonly found in most soil samples that are collected near road, railroads, and parking lots. They are products of incomplete combustion or burning of organic materials. The sample concentration that exceeded the screening criteria was 5.8 mg/kg and was found in Group 7 Igloo HA-306. This Igloo was serviced by Railroad and is situated on a cross road. The concentration that exceed screening criteria is similar that of New Jersey's background value for benzo(a)pyrene of 5 mg/kg.

Based on the lack of any chemicals relative to what was stored in the igloos and what was assessed in the study for the sediment, there is no indication of a release. Chemicals that were detected in sediment around the Igloos, were not indicative of a release. It is more likely this single exceedance is attributable to transportation from nearby roads or from the former railroads or other sources but not igloos.

(5.) CONCLUSIONS

a.) Revetments should not be sampled since they were never used as storage facilities and should not be considered as potential storage areas. These were staging and turn around areas for trucks and would not have been used except temporarily for loading.

b.) ECMs were used to stored explosives and propellants and other high explosive materials. Only a few of Group 3 AGMs were used to store propellant and smokeless powder. The rest of the AGMs stored inert materials and equipment and served as warehouses not magazines. All

material was removed from the AGMs and they were cleaned out during the 1984 Demilitarization Process. The AGMs have been used strictly as general storage areas since the early 1990s.

c.) Former Plant Area ECMs were serviced by Rail Roads. The Former Depot Area ECMs were serviced by Roads.

d.) Records, as well as interviews with former employees and members of the Golden Cargo Unit of the MARID Team from McAlester, show/state that the igloos that HE in them were under constant surveillance and materials stored in the ECMs were inspected and maintained so that potential spills could be quickly cleaned. They were kept clean and maintained. Managing companies as well as the Army had Explosive Specialists that had to inspect the ECMs on a frequent basis.

e.) From 2000 to 2002, the Golden Cargo Unit from the MARID Team from McAlester moved materials (Comp B and nitroguanidine) in the Former Plant Area ECMs to the Former Depot Area to consolidate materials before shipping. Former team members verified that the ECMs were clean and maintained.

f.) The Golden Cargo Unit from the MARID Team emptied all the ECMs and the material was shipped off of RVAAP. The ECMs were emptied, cleaned, certified, and then closed following DOD Regulations. The Golden Cargo Unit sealed all the ECMs with tamper indicators called Ball Seals. They took the expensive locks off the ECMs and these were taken back to McAlester for re-use. Interview information indicated that LTC Tadsen had the ball seals removed and some were replaced with padlocks.

g.) There are a few ECMs that have been designated and are available for use to store munitions/debris from restoration program projects.

h.) Visual inspections completed on the 70 ECMs for the High Priority Igloos indicated that all of these ECMs were empty.

i.) Sampling and analysis of the 30 ECMs identified as High Priority Igloos did not indicate that there had been a release in the soil, drainage ditch sediment (dry), or in surface water samples collected from 10 of the High Priority Igloos.

j.) Based on the results of the HRRE, the soil, sediment, and surface water at the ECMs and AGMs have not been impacted by storage activities. The ECMs and the AGMs do not contain contamination and should not be considered as an AOC.

k.) No additional sampling or analysis is recommended for any of the ECMs and the AGMs.

l.) ECMs were used and still are at various installations across the US. The design and requirements of storage magazines has developed and evolved so that currently used magazines are based on improved designs. Storage Magazines were modified and used differently depending what was being stored within them. No other installation in the US would have been used exactly as those on RVAAP.

The Ohio EPA stated previously that precedence was set for RVAAP because igloos had been designated as AOCs on Fort Wingate Depot (McKinley County, New Mexico) and Joliet Army

Ammunition Plant (Joliet, Illinois). The materials stored in the igloos on Fort Wingate (radioactive material) and Joliet (materials for TNT Production) were different than those stored in the igloos on RVAAP. The investigations into the Igloos at Fort Wingate revealed that the only contaminant was lead in the soil around some of the igloos and was the result of the extensive amount of lead-based paint that had been applied on the outside and had been cooked off from the heat. No other contaminants were identified. The igloos at Joliet were fully investigated and the only contaminant found was PCB in the soil at three of the igloos. The PCB was shown to have come from the transformers from the electric doors. Results from remedial investigations of the igloos (ECMs) at these two installations support findings of the HP Igloo study on RVAAP and this HRRE. No contamination was found in the RVAAP igloos and no additional investigations are required.

(6.) Locations Researched, Resources Consulted or Contacted, and Information Researched for the HRRE

a.) Former Ravenna Army Ammunition Plant, Ravenna, Ohio.

(1.) RVAAP Access – online resource for Ravenna Army Ammunition Plan Restoration News and Information – (http://www.rvaap.org/).

a.) RVAAP Photo Album.
b.) Historic Archives – Ravenna Ordnance Plant Newsletters CY 1971 to 1941.
c.) Ravenna Ordnance Plant Manual of Safe Practices, January 1941.
d.) RVAAP Documents – 1940 to 2005 for information regarding munition storage magazines and historical/general information.

(2.) Vista Sciences Corporation, Gail Harris, (Archival/Technical Librarian).

a.) Searched archives and reports in records on the Ravenna Environmental Information Management System (REIMS).
b.) Searched Cold Storage Boxes #15, contained 3000 pages of applicable documents such as ATRs.

(3.) Persons contacted or interviewed:

a.) Former employees of Olin Corporation: Gary Wolfgang (Olin Ordnance Safety and Surveillance Manager); Thomas Chanda (Olin Environmental Manager); and Tim Morgan (Olin Environmental Manager).
b.) Mason & Hanger Group Inc.
c.) Mark Patterson (former BRAC Environmental Coordinator).

b.) Camp Ravenna – NG and OHARNG, Camp Ravenna Joint Military Training Center (CRJMTC), Newton Falls, Ohio.

(1.) Persons contacted and or interviewed: Katie Tait (Environmental Specialist 2); Tim Morgan (State Environmental Supervisor); and Kevin Sedlak (Restoration Project Manager).

(2.) Installation Restoration Plans – 2000 through 2013.

(3.) Draft ESSP (not available for Public release or review).

c.) USACE (Louisville District), Louisville, Kentucky.

(1.) Databases accessed: Formerly Used Defense Sites (FUDS) Management Information System (FUDSMIS) and FUDS Record Management Database (FRMD).

(2.) Persons contacted or interviewed: Glen Beckham (USACE Project Manager); Greg Moore (USACE Project Manager); Derek Kinder (USACE Civil Engineer/Technical Manager); Tom Chanda (Technical Manager/Biologist); and Nat Peters (Senior Environmental Engineer/ Subject Matter Expert).

d.) Rock Island Arsenal, Rock Island, Illinois.

(1.) Keri Pleasant, the Rock Island Command Historian of JMC searched records and inventories and determined none of the Ravenna records contained information on igloo inspection or igloo inventory.

(2.) Checked with Savanna Army Ammunition Plant Records Manager. No Ravenna records were located.

e.) McAlester Army Ammunition Plant (JMMC-DOC), McAlester, Oklahoma.

(1.) Databases accessed: Installation historical archives records and database researched by Mr. Barker.

(2.) Persons contacted or interviewed: Tony Hampton (Joint Munitions Command, Operations Center Chief); Jeamon Chancellor (former member of the JMC Golden Cargo Transportation Unit and MARID Team Work Leader; currently with Department of Public Works).

(3.) McAlester Records - Ravenna Team's Weekly Activity Reports for shipment of materials from Igloos by the Golden Cargo Transportation Unit, MARID Team). Five filing cabinet drawers with complete records from first to last shipment records of removal were located and reviewed.

f.) National Archives at the Chicago Federal Records Center, 7358 South Pulaski Road, Chicago, Illinois.

g.) Fort Wingate Depot Activity, McKinley County, New Mexico.

(1.) Persons contacted or interviewed: Mark Patterson (BRAC Environmental Coordinator) and Greg Moore (USACE Project Manager).

(2.) Fort Wingate Depot Activity Base Realignment & Closure Installation Plan, FY2013. Army Environmental Command.

h.) Joliet Army Ammunition Plant, Wilmington, Illinois.

(1.) Persons contacted or interviewed: Arthur Holz (Site Manager/Commander's Representative); Glen Beckham (USACE Project Manager); and Brooks Evans (USACE Technical Manager).

(2.) Fort Wingate Depot Activity Base Realignment & Closure Installation Plan, FY2013. US Army Environmental Command.

i.) Specific Documents reviewed other than listed previously in this Section. The references listed in the following n the does not include every reference reviewed and researched:

(1.) Military Explosives, Technical Manual, TM-9-2900. War Department. August 29, 1940.

(2.) Ammunition Inspection Guide, Technical Manual, TM 9-1904. War Department. March 2, 1944.

(3.) Building the Ravenna Ordnance Plant, A Job History. US Ordnance Department of the War Department.

(4.) The Ordnance Department: Planning Munitions for War; The Technical Series. US Army Center of Military History. Washington, D.C. 1990.

(5.) Ammunition and Explosive Safety Standards. US Army Pamphlet 385-64. Department of the Army. Washington, D.C., 24 May 2011 (Rapid Action Revision - RAR) revised October 2013).

(6.) The Army Ammunition Management System. Department of the Army Pamphlet 700-16. Department of the Army. Washington, D.C. 1 December 1982.

(7.) Storage and Supply Activity Operations. Army Regulation 740-1. Department of the Army. 26 August 2008.

(8.) The Army Safety Program. Army Regulation 385-10. Department of the Army. 23 August 2007. (RAR 14 June 2010).

(9.) Department of Defense Explosives Safety Board (DDESB) various Technical Papers, including DDESB Technical Paper 15, Approved Protective Construction.

(10.) Department of Defense Ammunition and Explosives Safety Standards. DOD 6055.9-STD. October 1992.

(11.) The World War II Ordnance Department's Government-Owned Contractor-Operated (GOCO) Industrial Facilities: Ravenna Ordnance Plant Historic Investigation. U.S. Army Materiel Command Historic Context Series, report of Investigations, Number 7A. United States Army Corps of Engineers, Fort Worth District. Prepared by Geo-Marine, Inc. December 1995.

(12.) Supply Bulletin Inspection of Supplies and Equipment, Ammunition Surveillance Procedures. Department of the Army. Washington, D.C. 1 September 2008. (revised 27 February 2013).

Prepared by:



U.S. Army Corps of Engineers
Louisville District
600 Martin Luther King Jr. Place
Louisville, Kentucky 40202-2232

(Electronic Submission only)
Included on Accompanying CD

APPENDIX:
Information Paper:
Documentation to support Summary of the Findings of Historical Review and Risk Evaluation of the Storage Magazines on the Former Ravenna Army Ammunition Plant (RVAAP), Ravenna, Ohio

JANUARY 2015

SUBJECT: Summary of the Findings of Historical and Risk Evaluation of the Storage Magazines on the Former Ravenna Army Ammunition Plant, Ravenna, Ohio and Attached Information Paper

Table of Contents of the Information Paper

Section	Contents
I.0	**Site Description**
2.0	**Construction, Design, and Use Information**
2.1	Information from the HP Igloos Sampling and Analysis Report
2.2	Excerpts from "The World War II Ordnance Departments' Government-Owned Contractor-Operated (GOCO) Industrial Facilities: Ravenna Ordnance Plant Historic Investigation – 1994, Gray & Pape, Inc. (US Army Materiel Command Historic Context Series, Report of Investigations Number 7A
2.3	**Excerpts from "Building the Ravenna Ordnance Plant; A Job History, 1941. United States Ordnance Department, War Department.**
3.0	**Example Photographs of Selected Igloos from the High Priority Investigation and Figures Showing Layout of the Igloos on RVAAP**
4.0	**Letters and Documents from the Ohio EPA that are Referenced in the HRRE**
4.1	**22 April 2014 Email from Ohio EPA Providing Comments on the Army's 16 April 2014 Presentation on the Revised Work Plan Approach for the Sampling and Analysis of the Storage Magazines on RVAAP**
4.2	12 January 2015 (date received by USACE from Nicholas Roope) Portions of Contact Report sent to USACE from the Ohio EPA Regarding their 3 July 2014 Meeting with Eileen Mohr (former Site Coordinator and PM for the Ohio EPA) Contact Report was incomplete and portions of the Contact Report.
4.3	**23 June 2011 Email Exchange between USACE and Army Regarding Preliminary Results from High Priority Igloo Investigation and the Ohio EPA's Opinion to Make the Igloos and AOC Considering these Preliminary Results at RVAAP and the Precedence for Igloo AOCs on Fort Wingate**
5.0	**Summary Tables and Information from the High Priority Igloo Investigation**
6.0	**Examples of Ammunition Transfer Records and Photographs From 1970's Showing Transfer of Munitions and Storage of Munitions in ECMs**
7.0	**Ravenna Ordnance Plant (ROP) Manual of Safe Practices (ROP 866-15M-1-13, ORD - 463**
8.0	**Selected Excerpts from the 1944 War Department Ammunition Inspection Guide Technical Manual, TM 9-1904 Regarding Magazine Inspections, Safety, Cleaning, and Storage**
9.0	**First and Last Shipping Records from the Golden Cargo Transportation Unit from McAlester Army Ammunition Plant Defense Ammunition Center, of the Joint Munition Command's Mobile Ammunition Renovation, Inspection, and Demilitarization (MARID) Team**
10.0	**History of the Ravenna Army Ammunition Plant prepared by Gail Harris (Vista Sciences Corporation)**
11.0	**Selected Examples of Current Army and NG Explosive Safety and Ammunition Storage Regulations**

APPENDIX A:

Information Paper:
Documentation to support Summary of the Findings of Historical Review and Risk Evaluation of the Storage Magazines on the Former Ravenna Army Ammunition Plant (RVAAP), Ravenna, Ohio

JANUARY 2015

Table of Contents

Section	Contents
I.0	**Site Description**
2.0	**Construction, Design, and Use Information**
2.1	Information from the HP Igloos Sampling and Analysis Report
2.2	Excerpts from "The World War II Ordnance Departments' Government-Owned Contractor-Operated (GOCO) Industrial Facilities: Ravenna Ordnance Plant Historic Investigation – 1994, Gray & Pape, Inc. (US Army Materiel Command Historic Context Series, Report of Investigations Number 7A
2.3	**Excerpts from "Building the Ravenna Ordnance Plant; A Job History, 1941. United States Ordnance Department, War Department.**
3.0	**Example Photographs of Selected Igloos from the High Priority Investigation and Figures Showing Layout of the Igloos on RVAAP**
4.0	**Letters and Documents from the Ohio EPA that are Referenced in the HRRE**
4.1	**22 April 2014 Email from Ohio EPA Providing Comments on the Army's 16 April 2014 Presentation on the Revised Work Plan Approach for the Sampling and Analysis of the Storage Magazines on RVAAP**
4.2	12 January 2015 (date received by USACE from Nicholas Roope) Portions of Contact Report sent to USACE from the Ohio EPA Regarding their 3 July 2014 Meeting with Eileen Mohr (former Site Coordinator and PM for the Ohio EPA) Contact Report was incomplete and portions of the Contact Report were not included.
4.3	**23 June 2011 Email Exchange between USACE and Army Regarding Preliminary Results from High Priority Igloo Investigation and the Ohio EPA's Opinion to Make the Igloos and AOC Considering these Preliminary Results at RVAAP and the Precedence for Igloo AOCs on Fort Wingate**
5.0	**Summary Tables and Information from the High Priority Igloo Investigation**
6.0	**Examples of Ammunition Transfer Records and Photographs From 1970's Showing Transfer of Munitions and Storage of Munitions in ECMs**
7.0	**Ravenna Ordnance Plant (ROP) Manual of Safe Practices (ROP 866-15M-1-13, ORD -463**
8.0	**Selected Excerpts from the 1944 War Department Ammunition Inspection Guide Technical Manual, TM 9-1904 Regarding Magazine Inspections, Safety, Cleaning, and Storage**
9.0	**First and Last Shipping Records from the Golden Cargo Transportation Unit from McAlester Army Ammunition Plant Defense Ammunition Center, of the Joint Munition Command's Mobile Ammunition Renovation, Inspection, and Demilitarization (MARID) Team**
10.0	**History of the Ravenna Army Ammunition Plant prepared by Gail Harris (Vista Sciences Corporation)**
11.0	**Selected Examples of Current Army and NG Explosive Safety and Ammunition Storage Regulations**

SECTION 1:

INTRODUCTION

1.0 INTRODUCTION

The United States Army Corps of Engineers (USACE) Louisville District (CELRL) has prepared this Appendix A: Information Paper (Information Paper) to provide documentation and support for the Technical Memorandum regarding the Historical Review and Risk Evaluation (HRRE) of the Storage Magazines (igloos) on the Former Ravenna Army Ammunition Plant, Ravenna, Ohio (RVAAP). Only general historical information regarding the igloos and their use specific to the Technical Memorandum are included. This Information Paper should not be considered exhaustive and does not include all available information or documentation.

The intent of the HRRE was to present information regarding the Storage Magazines and recommendations of the path forward if the findings of the HRRE indicated additional analysis and investigation was necessary. In this Information Paper, the earth covered magazines (ECMs) are referred to as igloos since this is what was historically called igloos at Ravenna and in general at other facilities. The above ground storage magazines (AGMs) were added later, after the initial investigation of the High Priority Igloo study was completed. The AGMs are to be researched to determine their historical use and whether or not they should be part of an Area of Concern (AOC) with the igloos. The information contained herein primarily focuses on the ECMs.

The approach used to complete the HRRE is similar to the Preliminary Assessment (PA) and Site Inspection in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process; however, one objective of the HRRE was to determine whether or not the storage magazines are actually a site (i.e., *uncontrolled release*) that needs to be investigated under CERCLA as an AOC.

The HRRE included review of the construction and design of the various types, historical use, inventory records, inspection reports, shipping, and an assessment of the soil data collected in 2011 at certain 'High Priority" Igloos. The soil, sediment, and surface water data was collected under a previous Task (Project Order) and results are summarized herein.

SECTION 2:

INFORMATION DESCRIBING CONSTRUCTION OF IGLOOS

2.0 IGLOO DESCRIPTIONS AND INFORMATION

2.1 Information from the High Priority Igloos Sampling and Analysis Report

High Priority Igloos were all Earth Covered Magazines (ECMs) identified in Block B, Block C, Block D, Group 1 and 1A, and Group 7 areas. Figures in Section 3 of this Information Paper show where the Igloos are located. Descriptions of these areas and their historical use are provided in the following:.

Block B igloos were historically referred to as Igloo Areas B. B Block contains 96 truck-serviced storage igloos. The igloos measure approximately 60 feet in length, are of arch-type construction with reinforced concrete, and are earthen covered. The igloos were historically used to store bulk explosives and/or bulk propellants.

The Block C Igloos were historically referred to as Igloo Area C. Block C contains 99 truck-serviced storage igloos. The igloos measure approximately 60 feet in length, are of Arch-type construction with reinforced concrete, and are earthen covered. The Igloos were historically used to store bulk explosive and/or bulk propellants. Block C is located in the western portion of the former RVAAP, east of the former Depot Area.

Block D Igloos contains 99 truck-serviced storage igloos. The igloos measure approximately 60 feet in length, are of arch-type construction with reinforced concrete, and are earthen covered. The igloos were historically used to store munitions, bulk explosive, and bulk propellants. Block D is located in the north central portion of the former RVAAP, northwest of Winklepeck Burning Grounds.

Group 1 and 1A Magazines were historically referred to as Bomb Storage Area 1, and Ammunition Storage Area 1A, respectively. Group 1 contains 40 storage igloos, and Group 1A contains 80 storage igloos. Each of the igloos was historically serviced by Rail; however, the rails are now removed and the railroad ballast remains in place. The igloos each measure approximately 60 feet in length, are of arch-type construction with reinforced concrete, and earthen covered. The igloos were historically used to store munitions, bulk explosives, and bulk propellants. Group 1 and 1A are located in the north central portion of the former RVAAP, north of Winklepeck Burning Grounds.

The Group 7 igloos are located in the northeast portion of the former RVAAP. Group 7 contains 66 storage igloos. Each of the igloos was historically serviced by rail; however, the rails are now removed and the railroad ballast remains in place. The igloos each measure approximately 40 feet in length, are of arch-type construction with reinforced concrete, and are earthen covered. The igloos were historically used to store bulk explosive, and bulk propellants (USACE, 2011).

2.2. Excerpts from "The World War II Ordnance Departments' Government-Owned Contractor-Operated (GOCO) Industrial Facilities: Ravenna Ordnance Plant Historic Investigation – 1994, Gray & Pape, Inc. (US Army Materiel Command Historic Context Series, Report of Investigations Number 7A

The ROP was originally intended to contain three bomb and shell loading lines; two fuze lines; two booster lines and a plant for the production of ammonium nitrate for making amatol, a substitute for TNT in the early years of World War II; and storage facilities for inert materials and finished products. Numerous support buildings included eight boiler houses, administration buildings including a large hospital, single-family staff houses, two sewage plants, guard and fire houses, and dormitories. A detonator, artillery primer, and percussion element line were soon added, as well as a fourth load line, more warehouses, and an additional ammonium nitrate plant. By March I942, when the contractor operator took over all of the buildings for production, the plant contained I2 load lines, "forty explosives igloos, forty bomb igloos, eighty shell igloos, seventeen magazines for holding shells in suspense, twenty-one smokeless powder magazines, twenty-three fuze and booster magazines, seventy explosives magazines, six igloos for lead azide, tetryl and fulminate of mercury (two each), thirty-six inert storage warehouses, and I13 miles of railroad" (Voight I945:3) (Figure 2).

The combined acreage of the plant and depot was nearly two-thirds the size of the nearby city of Akron at that time and was in many aspects a self-sustaining city (Anonymous, Scrapbook article ss). In addition to the load lines, the plant contained "water works (2), sewage disposal and drainage, steam generating plants, outside steam, air and electric lines, plant transportation, material storage and magazines, plant maintenance, service and control laboratories, communications system, guard system, fire protection and plant safety, a hospital and first aid stations, ground, erosion control, etc., laundry, print shop, service garage, commissary, dwellings and dormitories, recreation center, and administration buildings" (APC 1943b:53). In fact, the plant's location was christened Apco, Ohio (an acronym for Atlas Powder Company), during World War II because it had a federal post office and a railroad passenger station (Morgan, interview 1994) (Tables I-6).

All but one of the lines are of permanent construction with steel superstructures, concrete foundations, corrugated asbestos roofs, and brick or tile walls, or as in the case of the storage igloos, reinforced concrete exteriors. The three load lines (the detonator, percussion element, and artillery primer lines) added to the Atlas contract in February 1941 were also of permanent construction (APC 1943b:3). The later supplements to the contract, dated June 1941 to December 11, 1941, included the buildings of Load Line IV and 24 inert storage warehouses, specified to be of temporary construction with wood frames and asbestos wall coverings (APC 1943b:3).

Table 1
Number of Buildings by Area at the Ravenna Ordnance Plant in 1943
(Does not include utility buildings and dormitories)

Load Line/Area	Number of Buildings (Principal Type)
Melt Load Line 1	26
Melt Load Line 2	22
Melt Load Line 3	21
Melt Load Line 4	22
Fuze Line No. 1	20
Fuze Line No. 2	26
Booster Line No. 1	19
Booster Line No. 2	18
Detonator Line	34
Artillery Primer Line	17
Percussion Element Line	26
Ammonium Nitrate Line No. 1	8
Ammonium Nitrate Line No.2	9
Inert Storage Warehouses	37
Smokeless Powder Magazines	26
Fuze and Booster Magazines	26
Ammunition Magazines	17
High Explosives Storage Igloos	106
Ammunition Storage Igloos	80
Bomb Storage Igloos	44
Administration Buildings	23
Staff Residences	15

Source: War Department 1943:2

to the north, with the exception of the Fuze and Booster Storage area, which lies in the southern half next to the Fuze and Booster Area (Figure 3). The official cost for construction of the plant came to $61,469,239 (Voight 1945:1). A cost of$77 million was attributed to the plant in a 1993 report, which ranks Ravenna as the tenth most expensive Government-Owned Contractor-Operated (GOCO) plant in the country (Murphey 1993:Appendix 1:6).

The World War II mission of the Ravenna plant was to load, assemble, and pack ammunitions of 75-mm, 76-mm, 155-mm, 240-mm, 6-inch, and 8-inch sizes; bombs of 100-pound, 500-pound, 1000-pound, and 2000-pound sizes; and munition components consisting of fuzes, boosters, detonators, artillery primers, and percussion elements. Additionally, the plant was involved in the production of ammonium nitrate, production.

Table 5
Ammonium Nitrate Line Buildings at the Ravenna Ordnance Plant in 1944

Type of Building/Structure	Type of Construction	Number
Neutral Liquor Storage Building	Steel and brick	1
Neutral Liquor Storage Building	Brick and wood	1
Change House	Steel, concrete and tile	1
Lunchroom	Wood and asbestos shingles	1
Office Building	Brick	1
Evaporating & Crystallizing Units	Steel and tile	7
Time Clock Alley	Steel and brick	1
Boiler House	Steel and brick	1

Source: War Department 1944

Table 6
Storage Facilities at the Ravenna Ordnance Plant in 1944

Type of Building/Structure	Type of Construction	Number
Area 1 - Type 1, Bomb Storage Magazines	Reinforced concrete	40
Area 1A - Ammunition Storage Magazine	Reinforced concrete	80
Area 2 - Ammunition Storage Magazine, Type 2	Steel and tile	17
Area 3 - Smokeless Powder Magazine, Above Ground	Steel and Tile	21
Area 4 - Standard Magazine for Fuze and Booster Storage	Brick, steel and tile	26
Area 5 - High Explosive Storage Igloo, underground	Reinforced concrete	44
Area 6 - Inert Storage Building		
LCL Inert Storage Warehouse		
Change house		
Steel and brick		8
Steel and brick		1
Steel and tile		1
Area 7 - High Explosive Storage Igloo, underground	Reinforced concrete	66
Area 8 - Inert Storage Warehouse	Wood and sheet asbestos	24
Wet Storage Area		
Underground Storage Magazine - Fulminate Underground Storage Magazine - Azide Underground Storage Magazine - Tetryl		
Reinforced concrete		2
Reinforced concrete		2
Reinforced concrete		2

Source: War Department 1944

The most specialized type of building in the plant, and the type about which the public was most curious, were the storage igloos (Plate 10 and Figure 11). This type, developed by the War Department, was composed "essentially of a reinforced concrete arch, a heavy front and back reinforced concrete wall, and a reinforced concrete floor" (APC 1943b:19). Only a single steel door was located in the front wall of the building. The arch and back wall were mounded with earth and seeded to serve as a barricade and to provide a measure of natural cover from aerial views (APC 1943b:19).

The dictation of such strict standards for the industrial buildings left little room for architectural statements, given the scarcity of time (75 designers and draftsmen worked day and night on the drawings) and the engineering emphasis of the buildings (McDowell 1941:48). The buildings that were not industrial in nature, particularly in the Administration Area, exhibited elements of the popular Colonial Revival style. Though following the tenets of mass production and standardization of materials and floor plans, the 15 staff houses in the Administration Area present the image of a typical cul-de-sac suburb from the period (Plate 11). It was agreed soon after the contracts were signed that Atlas Powder Company would provide the basic layouts using the typical designs proscribed by the Ordnance Department, and the architectural-engineering firm would perform the survey work (APC 1943b:5). The preliminary layout of the plant was made by Atlas engineers, and was based primarily on the Ordnance Department's requirements for the plant, tracks, the architectural-engineering firm supplied the railroad layouts in a progressive plan rather than as a complete layout (McDowell1941:74). he railroad mileage within the plan varies by report; however, the construction history reported 130 miles of railroad tracks (McDowell 1941:168).

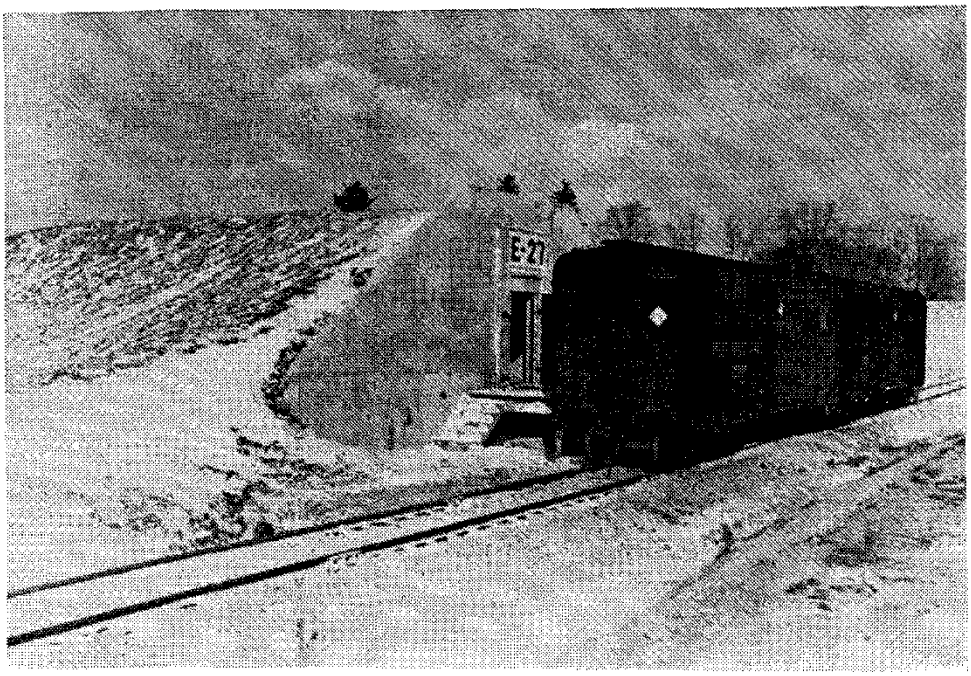


Plate 10. Ca. 1942 photograph of Type 1, Below Ground Bomb Storage Magazine E-27, Group 1 Storage Area, completed December 1, 1941. Commonly known as an igloo, this bomb storage type was developed to control fluctuating temperatures so that ammunition could be stored indefinitely (U.S. Government n.d.).

The pronounced functionality of the plant's layout and buildings is the most noteworthy aspect of its design. The Atlas report mentioned the development of steel bin barricades at this plant, in anticipation of barricades being required for igloos and other buildings, which were widely used elsewhere. They were not needed at this plant, however, due to the wide spacing between buildings and lines (APC 1944:39).

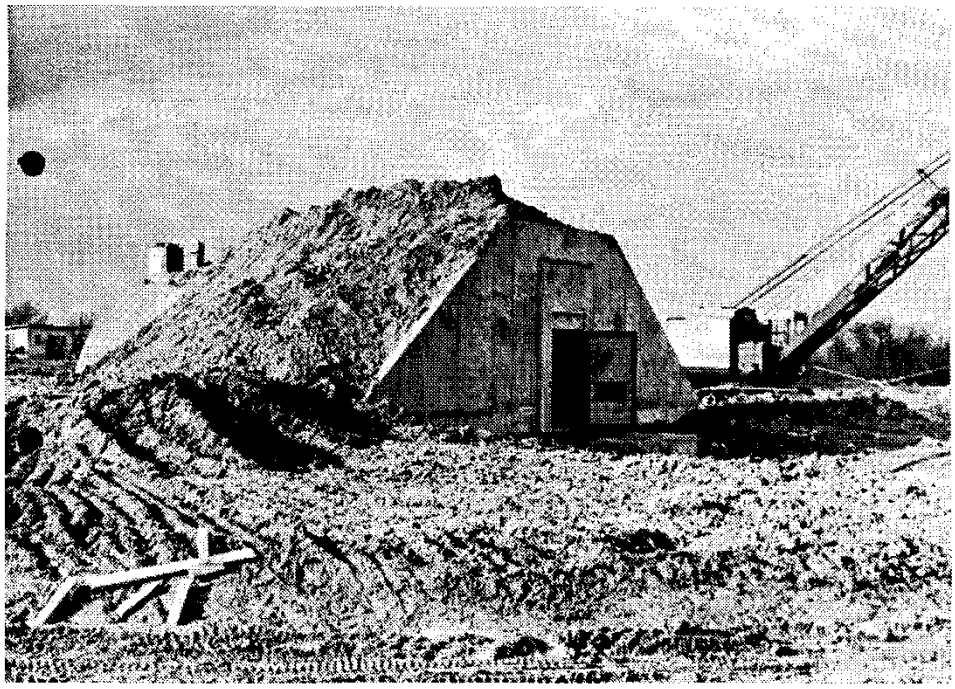


Plate 19. Hunkin-Conkey Construction Company photograph from December 26, 1941, shows the completed superstructure of Igloo WS-3 with topfill partially in place in the Wet Storage Area (Hunkin-Conkey Construction Company n.d.).

An igloo explosion on March 24, 1943, at the Portage Ordnance Depot was the most serious incident during the war years. Although the cause of the explosion is not definitely known, the event seems to have taken place while cluster bombs were being loaded into the igloo. Eleven people and the igloo instantly vaporized (*CPD* 1968). Many of the informants interviewed during the current research phase remembered a loud explosion which could only be heard east of the depot. Everyone was sure it was one of the load line buildings (which are on the extreme east side of the plant) because of where they heard the sound (Decker, interview 1994; Lock, interview 1994; G. Walters, interview 1994). The incident is not mentioned in the Atlas histories, nor were there any reports of any other explosions.

2.3. Excerpts from "Building the Ravenna Ordnance Plant; A Job History, 1941. United States ORDNANCE department.

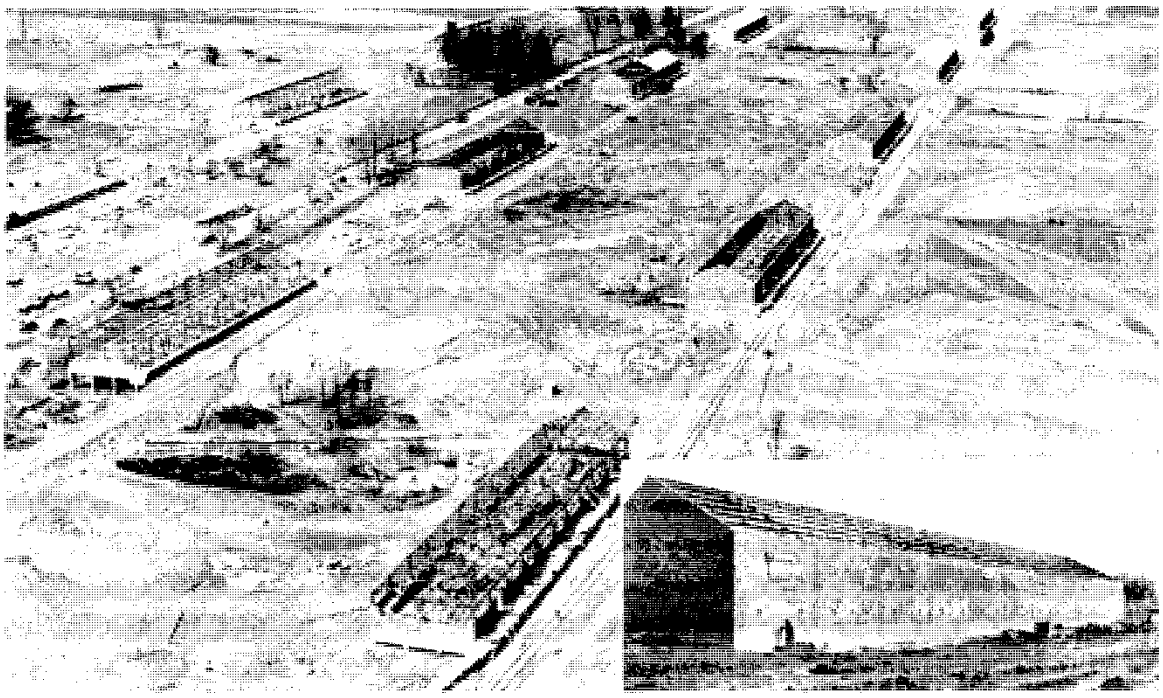
When the buildings have progressed to where structural steel is required, Bob McDowell, our travelling superintendent of structural steel erection is on the scene. But weeks previous to starting here he had been expediting this material in the steel mills in Pittsburgh and elsewhere. The expediting and erection of structural steel for the whole project is in charge of Mr. McDowell and just to keep him busy we made him responsible for the applying of all the asbestos roofing and siding and the setting of all the equipment and machinery. Usually the masonry work follows the structural work, and here the strong defender of masonry construction over wood construction, Walter Hardley, is in competent charge as travelling superintendent. Masonry construction is common to all buildings, except the igloos; the ordering, unloading and erection of material is carried on smoothly.



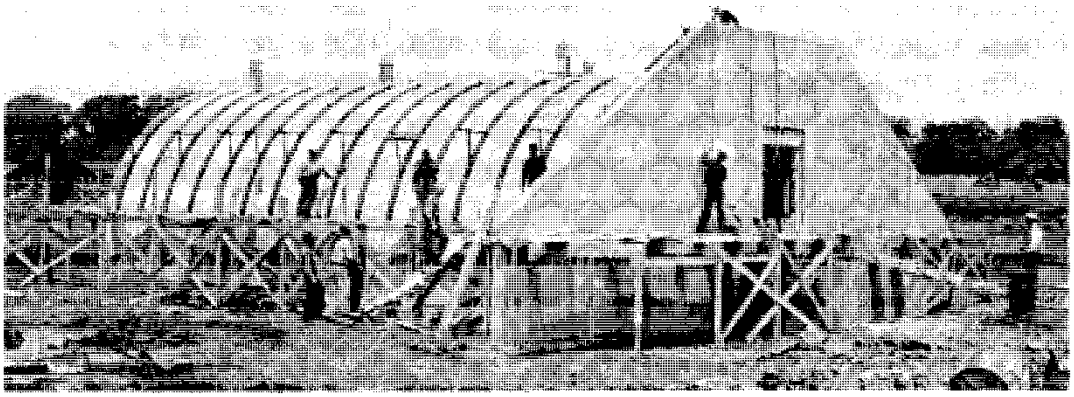
Completed igloos in Group 5 ready for backfill.

Igloos were discussed by everyone for by now Col. Chavin had announced that a Depot Area, containing more than 400 igloos arranged into five groups situated on some 7,000 acres to the west of the Plant Area was to be opened up immediately. We were awarded the contract for construction, while a Columbus firm, the Jennings-Lawrence Co., arrived and took up duties as architect-engineer.

Group lA, a very large battlement of igloos, made a definite bid for attention at this time, arched concrete tops sparkling with newness. The big storage maga-zines of Group 2 lacked for completion only the exodus of sheeters who were still applying corrugated asbestos roofing. Group 3 needed only minor grading and Group 3 needed only minor grading and final touch-ups before Atlas would take them over. The little warehouses of Group 4 were beginning to show some semblance of shape. The job was bursting with bigness, but the end wasn't even faintly in sight.



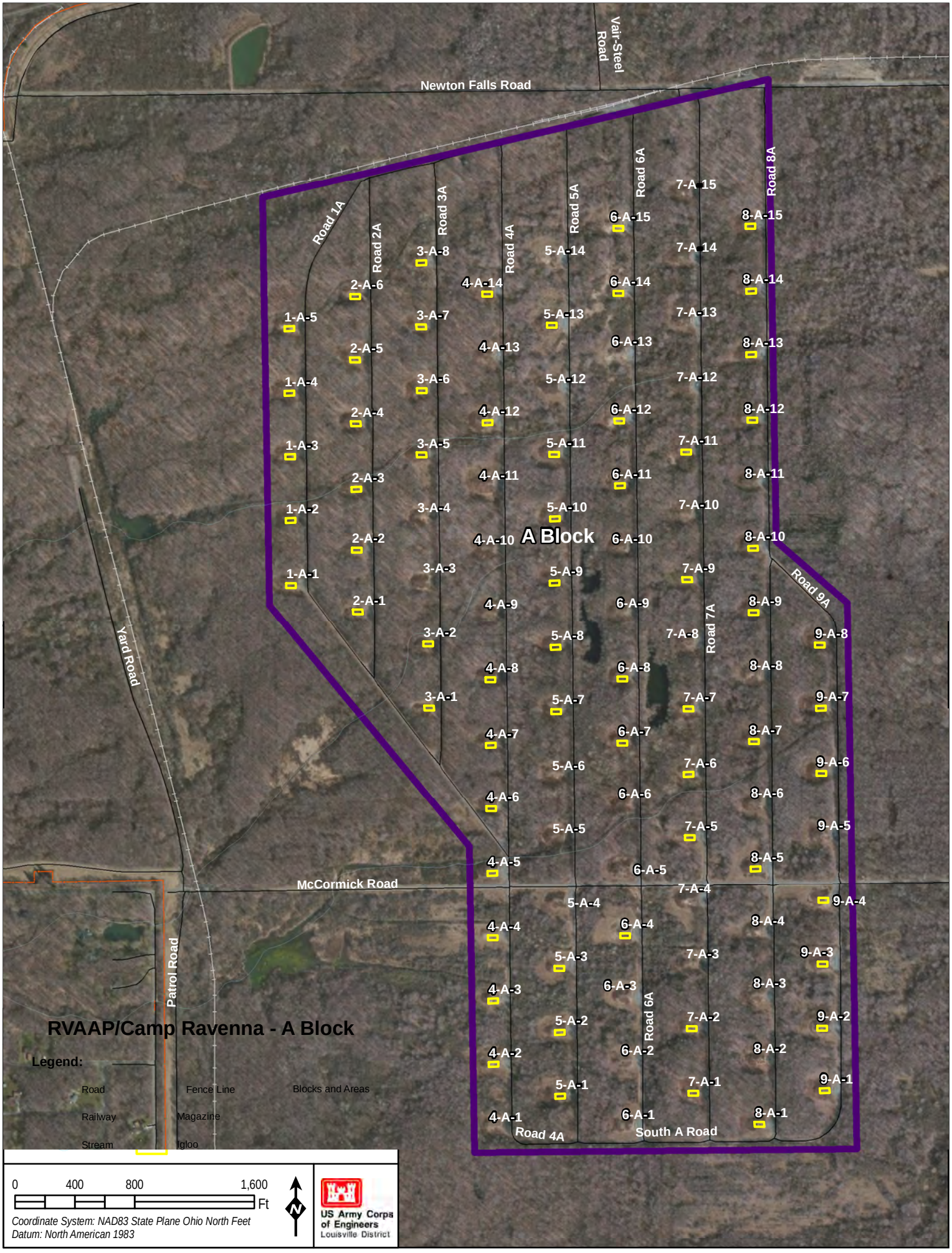
"We had better than average foremen, a real necessity in the event of small, difficult to place pours as well as large pours where speed is essential. All concrete was mixed in transit, a time saving device in itself. Quality of work has never been sacrificed, and the class of workmanship speaks for itself, even though a great deal of concrete has been placed under adverse conditions. "Morale of the concrete department has been very high and we have had a lot of fun in between times; as a matter of fact, if you ever lost your sense of humor in this department you'd just be sunk. None of us would change places with anyone."

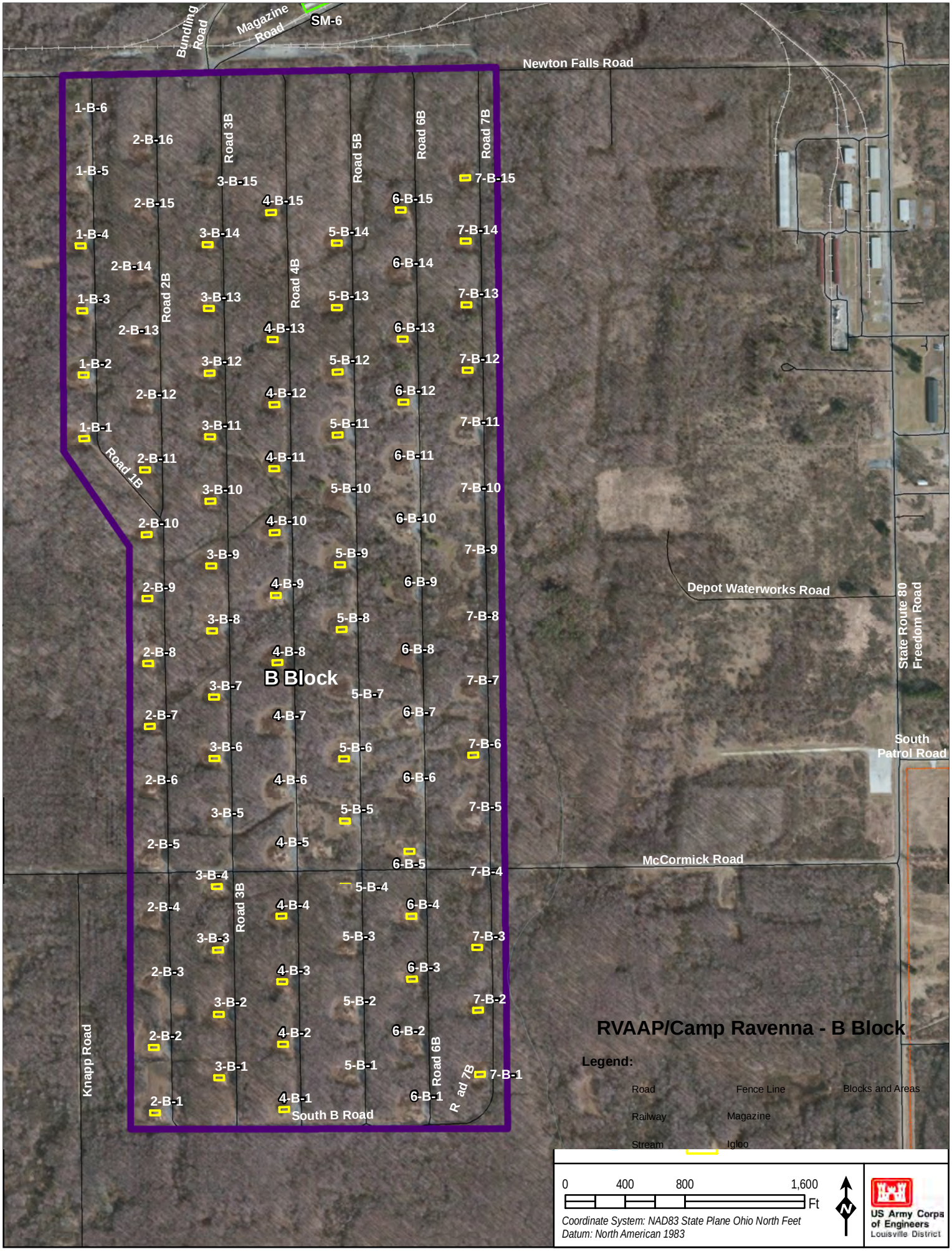


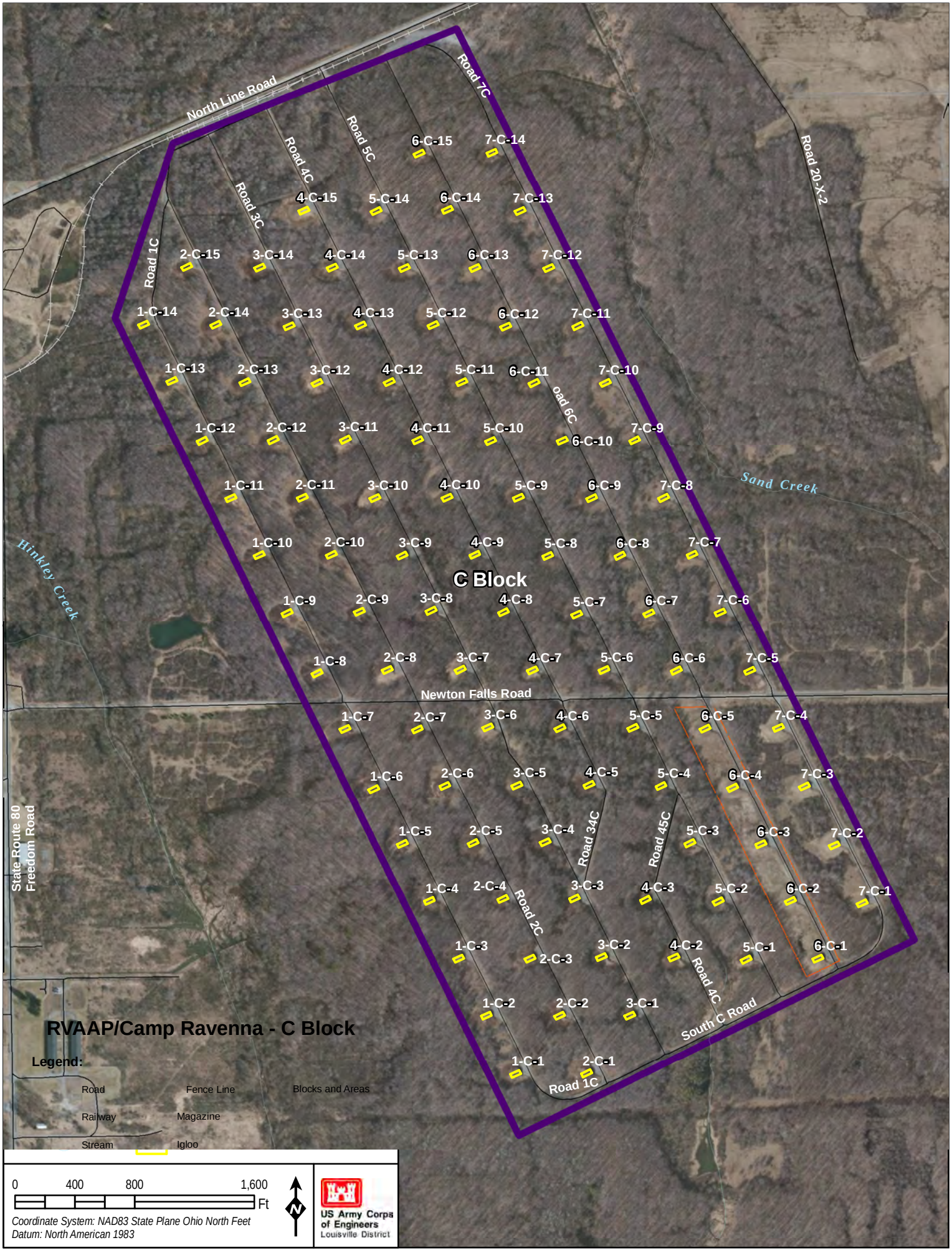
Completely poured igloo with outside ribs still in place.

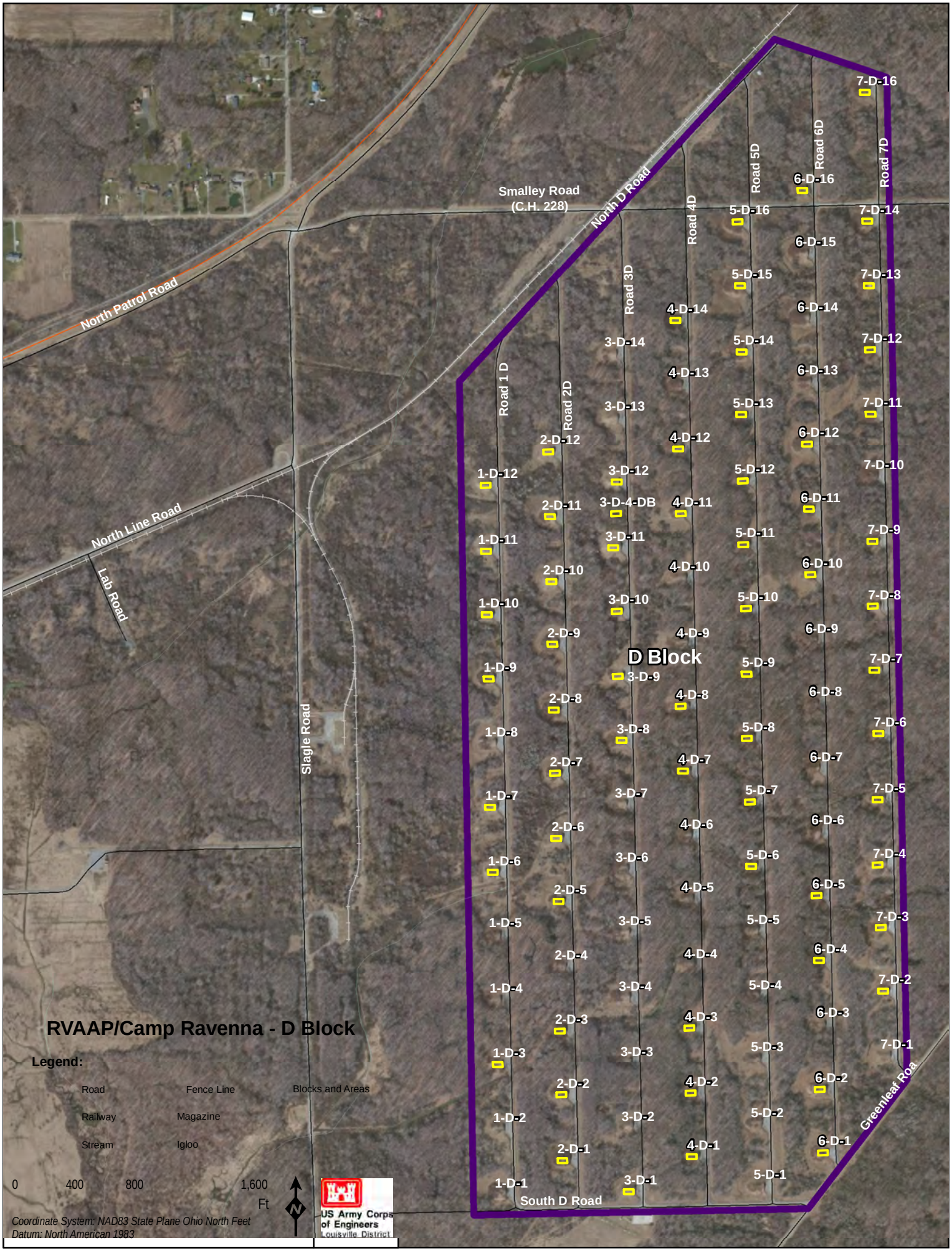
SECTION 3:

EXAMPLE PHOTOGRAPHS OF SELECTED IGLOOS FROM THE HIGH PRIORITY INVESTIGATION AND FIGURES SHOWING LAYOUT OF IGLOOS ON RVAAP

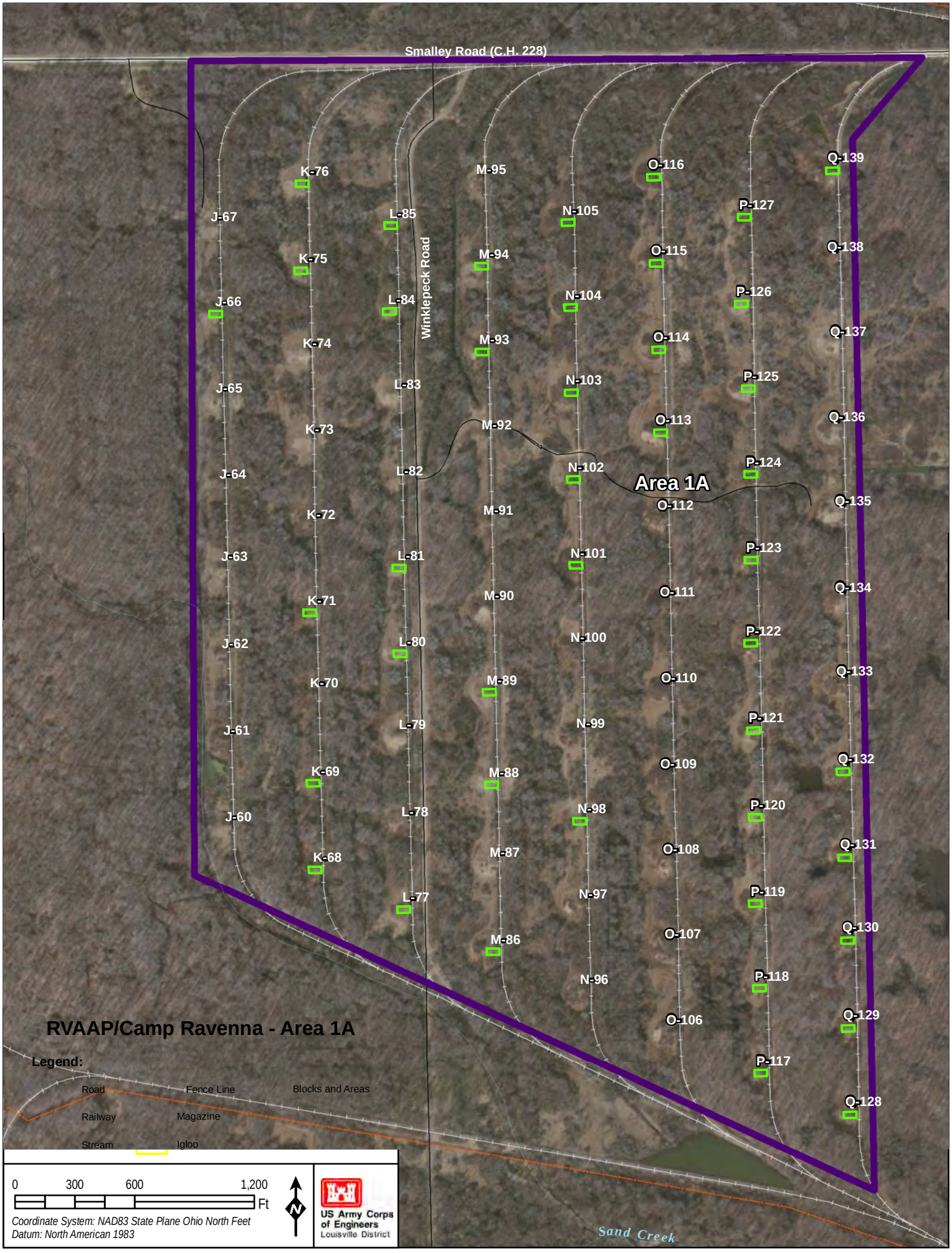

Vair-Steel Road
Newton Falls Road
Road 1A
Road 2A
Road 3A
Road 4A
Road 5A
Road 6A
Road 8A
Road 9A
Road 7A
Yard Road
Patrol Road
McCormick Road
Road 4A
South A Road
A Block
1-A-5
1-A-4
1-A-3
1-A-2
1-A-1
2-A-6
2-A-5
2-A-4
2-A-3
2-A-2
2-A-1
3-A-8
3-A-7
3-A-6
3-A-5
3-A-4
3-A-3
3-A-2
3-A-1
4-A-14
4-A-13
4-A-12
4-A-11
4-A-10
4-A-9
4-A-8
4-A-7
4-A-6
4-A-5
4-A-4
4-A-3
4-A-2
4-A-1
5-A-14
5-A-13
5-A-12
5-A-11
5-A-10
5-A-9
5-A-8
5-A-7
5-A-6
5-A-5
5-A-4
5-A-3
5-A-2
5-A-1
6-A-15
6-A-14
6-A-13
6-A-12
6-A-11
6-A-10
6-A-9
6-A-8
6-A-7
6-A-6
6-A-5
6-A-4
6-A-3
6-A-2
6-A-1
7-A 15
7-A 14
7-A-13
7-A-12
7-A-11
7-A-10
7-A-9
7-A-8
7-A-7
7-A-6
7-A-5
7-A-4
7-A-3
7-A-2
7-A-1
8-A-15
8-A-14
8-A-13
8-A-12
8-A-11
8-A-10
8-A-9
8-A-8
8-A-7
8-A-6
8-A-5
8-A-4
8-A-3
8-A-2
8-A-1
9-A-8
9-A-7
9-A-6
9-A-5
9-A-4
9-A-3
9-A-2
9-A-1
RVAAP/Camp Ravenna - A Block
Legend:
Road
Railway
Stream
Fence Line
Magazine
Igloo
Blocks and Areas
0
400
800
1,600
Ft
Coordinate System: NAD83 State Plane Ohio North Feet
Datum: North American 1983
N
US Army Corps of Engineers
Louisville District

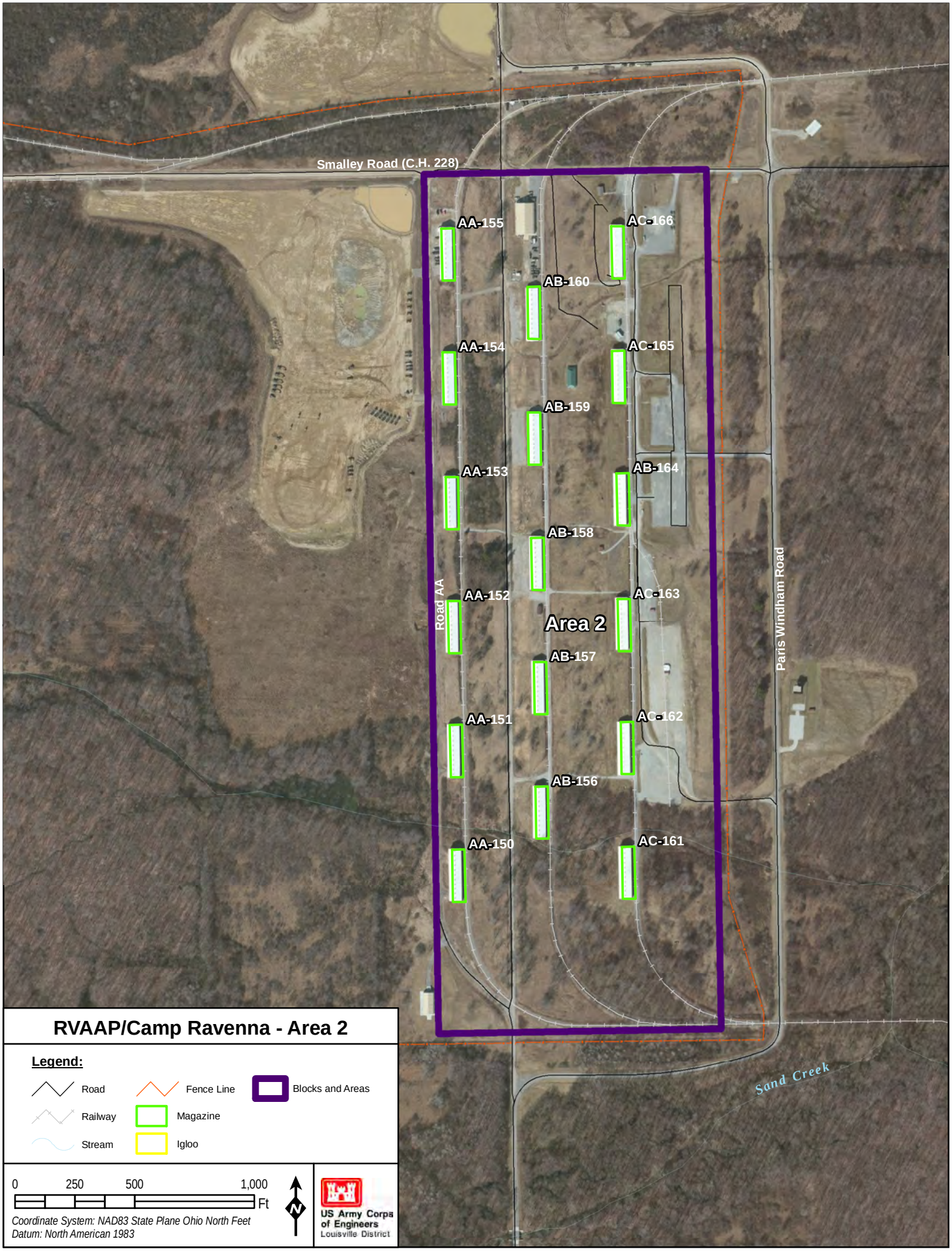

Bundling Road
Magazine Road
SM-6
Newton Falls Road
Road 3B
Road 5B
Road 6B
Road 7B
Road 2B
Road 4B
Road 1B
B Block
Depot Waterworks Road
State Route 80
Freedom Road
South Patrol Road
McCormick Road
Knapp Road
South B Road
Road 6B
Road 7B
RVAAP/Camp Ravenna - B Block
Legend:
Road
Railway
Stream
Fence Line
Magazine
Igloo
Blocks and Areas
0
400
800
1,600
Ft
Coordinate System: NAD83 State Plane Ohio North Feet
Datum: North American 1983
US Army Corps of Engineers
Louisville District


North Line Road
Road 7C
Road 5C
Road 4C
Road 3C
Road 1C
Road 20-X-2
Road 6C
Sand Creek
Hinkley Creek
C Block
Newton Falls Road
State Route 80
Freedom Road
Road 34C
Road 45C
Road 2C
Road 4C
South C Road
Road 1C
6-C-15
7-C-14
4-C-15
5-C-14
6-C-14
7-C-13
2-C-15
3-C-14
4-C-14
5-C-13
6-C-13
7-C-12
1-C-14
2-C-14
3-C-13
4-C-13
5-C-12
6-C-12
7-C-11
1-C-13
2-C-13
3-C-12
4-C-12
5-C-11
6-C-11
7-C-10
1-C-12
2-C-12
3-C-11
4-C-11
5-C-10
6-C-10
7-C-9
1-C-11
2-C-11
3-C-10
4-C-10
5-C-9
6-C-9
7-C-8
1-C-10
2-C-10
3-C-9
4-C-9
5-C-8
6-C-8
7-C-7
1-C-9
2-C-9
3-C-8
4-C-8
5-C-7
6-C-7
7-C-6
1-C-8
2-C-8
3-C-7
4-C-7
5-C-6
6-C-6
7-C-5
1-C-7
2-C-7
3-C-6
4-C-6
5-C-5
6-C-5
7-C-4
1-C-6
2-C-6
3-C-5
4-C-5
5-C-4
6-C-4
7-C-3
1-C-5
2-C-5
3-C-4
5-C-3
6-C-3
7-C-2
1-C-4
2-C-4
3-C-3
4-C-3
5-C-2
6-C-2
7-C-1
1-C-3
2-C-3
3-C-2
4-C-2
5-C-1
6-C-1
1-C-2
2-C-2
3-C-1
1-C-1
2-C-1
RVAAP/Camp Ravenna - C Block
Legend:
Road
Railway
Stream
Fence Line
Magazine
Igloo
Blocks and Areas
0
400
800
1,600
Ft
Coordinate System: NAD83 State Plane Ohio North Feet
Datum: North American 1983
N
US Army Corps of Engineers
Louisville District


Smalley Road
(C.H. 228)
North Patrol Road
North Line Road
Lab Road
Slagle Road
North D Road
South D Road
Greenleaf Road
Road 1 D
Road 2D
Road 3D
Road 4D
Road 5D
Road 6D
Road 7D
D Block
7-D-16
6-D-16
5-D-16
7-D-14
6-D-15
5-D-15
7-D-13
4-D-14
6-D-14
3-D-14
5-D-14
7-D-12
4-D-13
6-D-13
3-D-13
5-D-13
7-D-11
2-D-12
4-D-12
6-D-12
1-D-12
3-D-12
5-D-12
7-D-10
2-D-11
3-D-4-DB
4-D-11
6-D-11
1-D-11
3-D-11
5-D-11
7-D-9
2-D-10
4-D-10
6-D-10
1-D-10
3-D-10
5-D-10
7-D-8
2-D-9
4-D-9
6-D-9
1-D-9
3-D-9
5-D-9
7-D-7
2-D-8
4-D-8
6-D-8
1-D-8
3-D-8
5-D-8
7-D-6
2-D-7
4-D-7
6-D-7
1-D-7
3-D-7
5-D-7
7-D-5
2-D-6
4-D-6
6-D-6
1-D-6
3-D-6
5-D-6
7-D-4
2-D-5
4-D-5
6-D-5
1-D-5
3-D-5
5-D-5
7-D-3
2-D-4
4-D-4
6-D-4
1-D-4
3-D-4
5-D-4
7-D-2
2-D-3
4-D-3
6-D-3
1-D-3
3-D-3
5-D-3
7-D-1
2-D-2
4-D-2
6-D-2
1-D-2
3-D-2
5-D-2
2-D-1
4-D-1
6-D-1
1-D-1
3-D-1
5-D-1
RVAAP/Camp Ravenna - D Block
Legend:
Road
Railway
Stream
Fence Line
Magazine
Igloo
Blocks and Areas
0
400
800
1,600
Ft
N
US Army Corps of Engineers
Louisville District
Coordinate System: NAD83 State Plane Ohio North Feet
Datum: North American 1983


Wadsworth Road
George Road
Smalley Road (C.H. 228)
Greenleaf Road
Road 7E
Road 6E
Area 1
F-40
C-13
E-30
B-6
D-21
F-39
7-E-6
C-12
E-29
6-E-7
8-E-5
B-5
D-20
F-38
7-E-5
C-11
E-28
6-E-6
8-E-4
B-4
D-19
F-37
7-E-4
C-10
E-27
6-E-5
8-E-3
B-3
D-18
F-36
7-E-3
C-9
E-26
6-E-4
8-E-2
B-2
D-17
F-35
7-E-2
C-8
E-25
6-E-3
8-E-1
B-1
D-16
F-34
7-E-1
C-7
E-24
6-E-2
D-15
F-33
6-E-1
E-23
D-14
F-32
E-22
F-31
RVAAP/Camp Ravenna - Area 1
Legend:
Road
Railway
Stream
Fence Line
Magazine
Igloo
Blocks and Areas
0
300
600
1,200
Ft
Coordinate System: NAD83 State Plane Ohio North Feet
Datum: North American 1983
US Army Corps of Engineers
Louisville District


Smalley Road (C.H. 228)
Winklepeck Road
Area 1A
K-76
M-95
O-116
Q-139
J-67
L-85
N-105
P-127
K-75
M-94
O-115
Q-138
J-66
L-84
N-104
P-126
K-74
M-93
O-114
Q-137
J-65
L-83
N-103
P-125
K-73
M-92
O-113
Q-136
J-64
L-82
N-102
P-124
K-72
M-91
O-112
Q-135
J-63
L-81
N-101
P-123
K-71
M-90
O-111
Q-134
J-62
L-80
N-100
P-122
K-70
M-89
O-110
Q-133
J-61
L-79
N-99
P-121
K-69
M-88
O-109
Q-132
J-60
L-78
N-98
P-120
K-68
M-87
O-108
Q-131
L-77
N-97
P-119
M-86
O-107
Q-130
N-96
P-118
O-106
Q-129
P-117
Q-128
RVAAP/Camp Ravenna - Area 1A
Legend:
Road
Railway
Stream
Fence Line
Magazine
Igloo
Blocks and Areas
0
300
600
1,200
Ft
Coordinate System: NAD83 State Plane Ohio North Feet
Datum: North American 1983
US Army Corps of Engineers
Louisville District
Sand Creek



RVAAP/Camp Ravenna - Area 2

Legend:

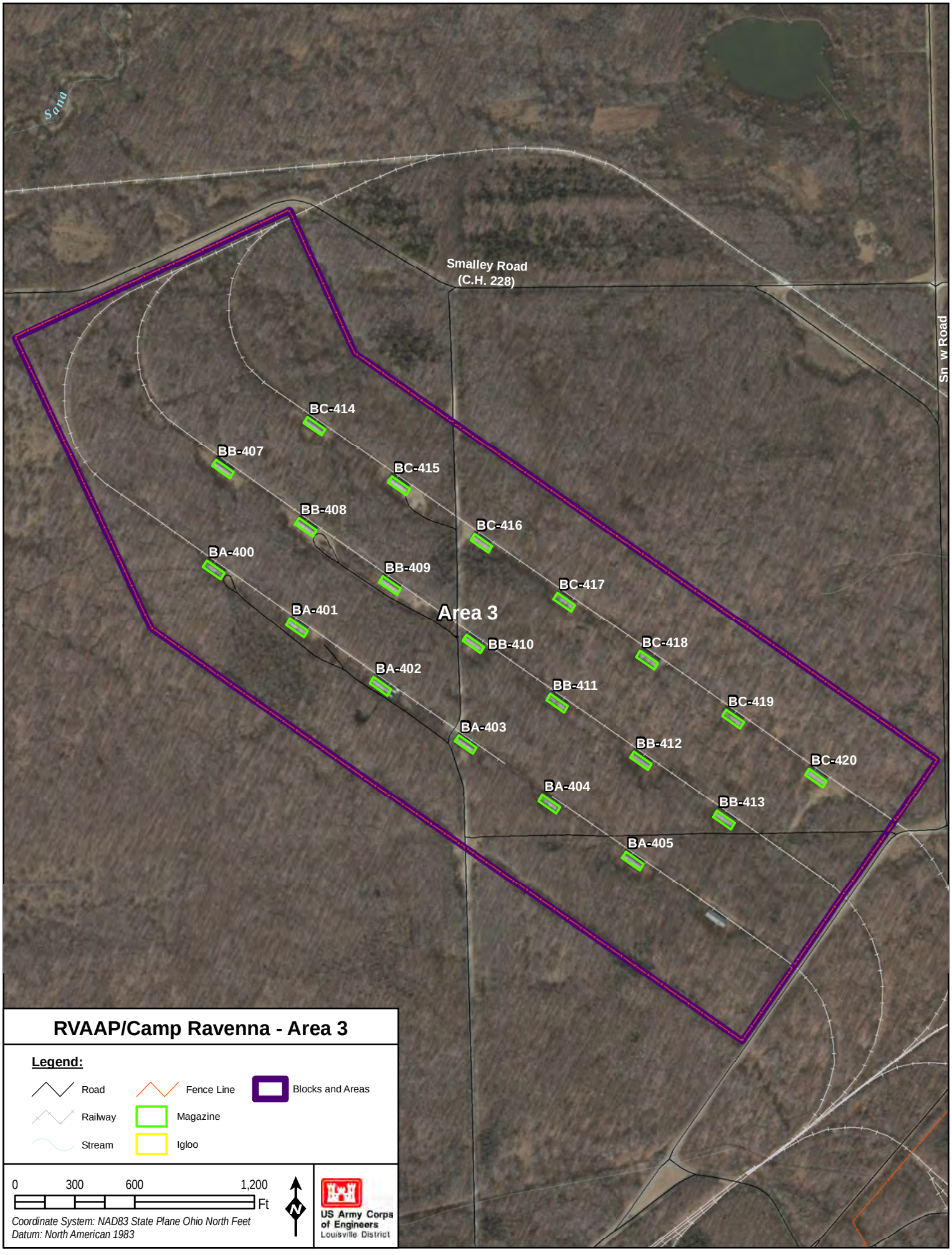
- Road
- Railway
- Stream
- Fence Line
- Magazine
- Igloo
- Blocks and Areas

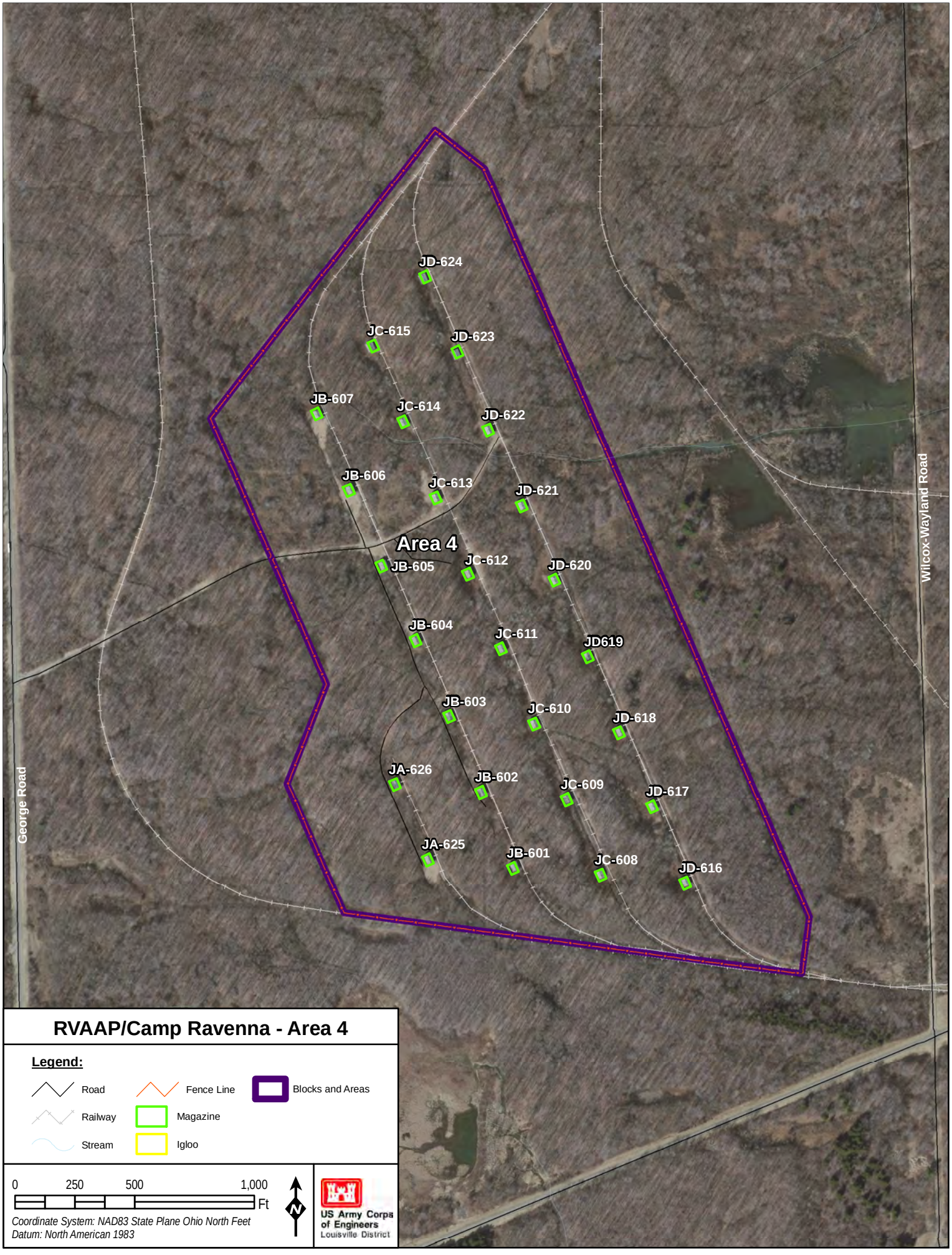
0 250 500 1,000 Ft

N

US Army Corps of Engineers
Louisville District

Coordinate System: NAD83 State Plane Ohio North Feet
Datum: North American 1983


Sand
Smalley Road
(C.H. 228)
Sn w Road
BC-414
BB-407
BC-415
BB-408
BC-416
BA-400
BB-409
BC-417
BA-401
Area 3
BB-410
BC-418
BA-402
BB-411
BC-419
BA-403
BB-412
BC-420
BA-404
BB-413
BA-405
RVAAP/Camp Ravenna - Area 3
Legend:
Road
Fence Line
Blocks and Areas
Railway
Magazine
Stream
Igloo
0
300
600
1,200
Ft
N
Coordinate System: NAD83 State Plane Ohio North Feet
Datum: North American 1983
US Army Corps
of Engineers
Louisville District



RVAAP/Camp Ravenna - Area 4

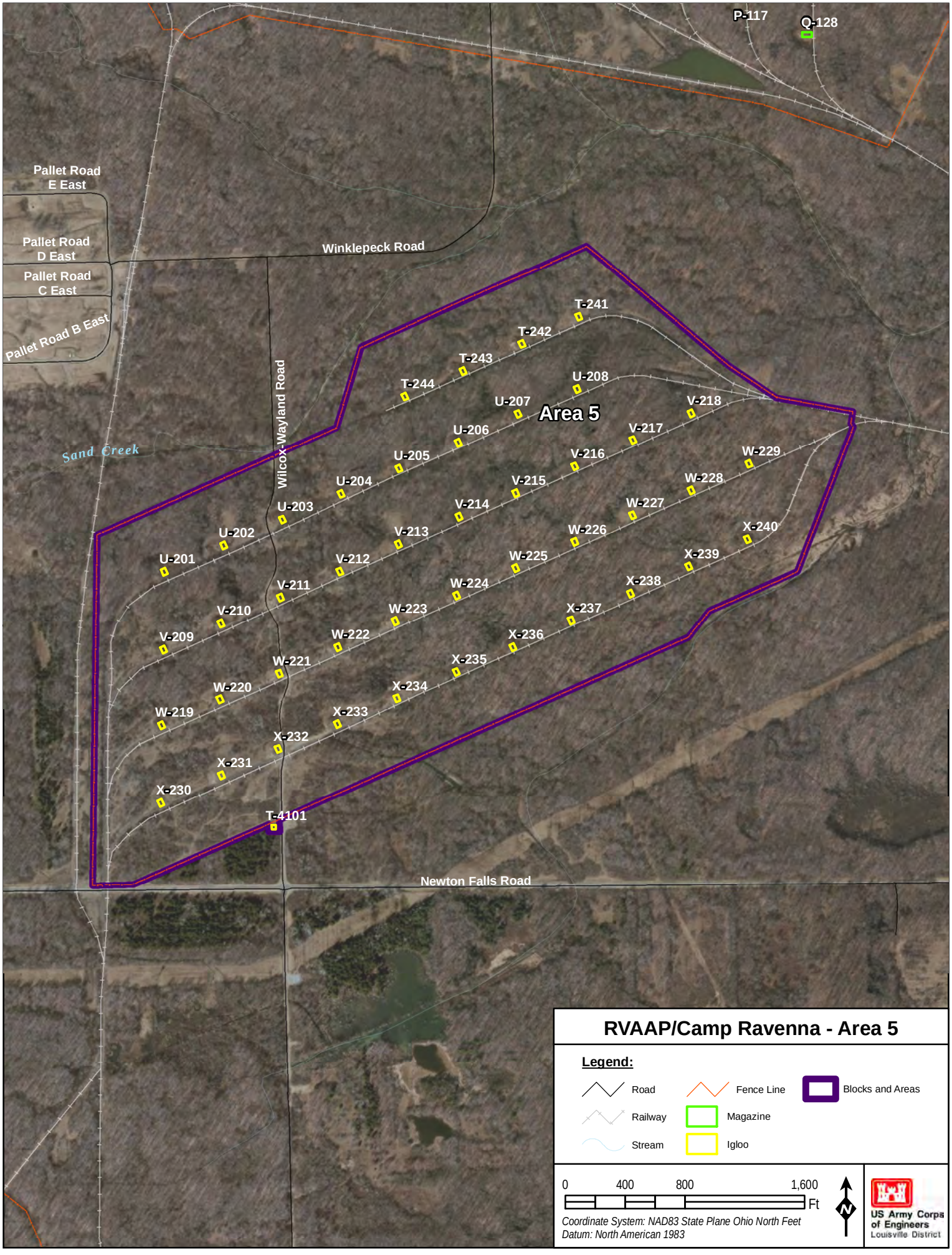
Legend:

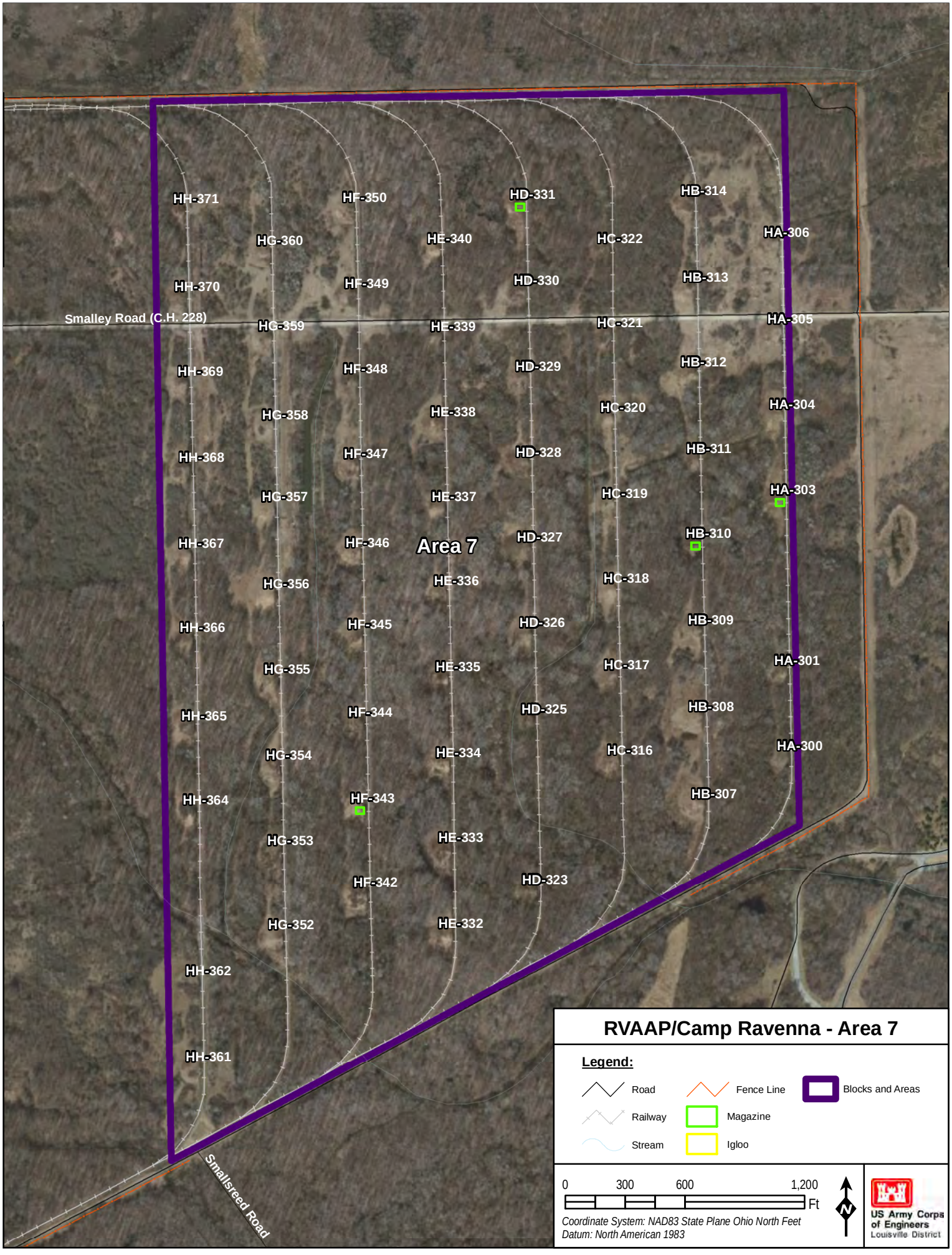
- Road
- Railway
- Stream
- Fence Line
- Magazine
- Igloo
- Blocks and Areas

0 250 500 1,000 Ft

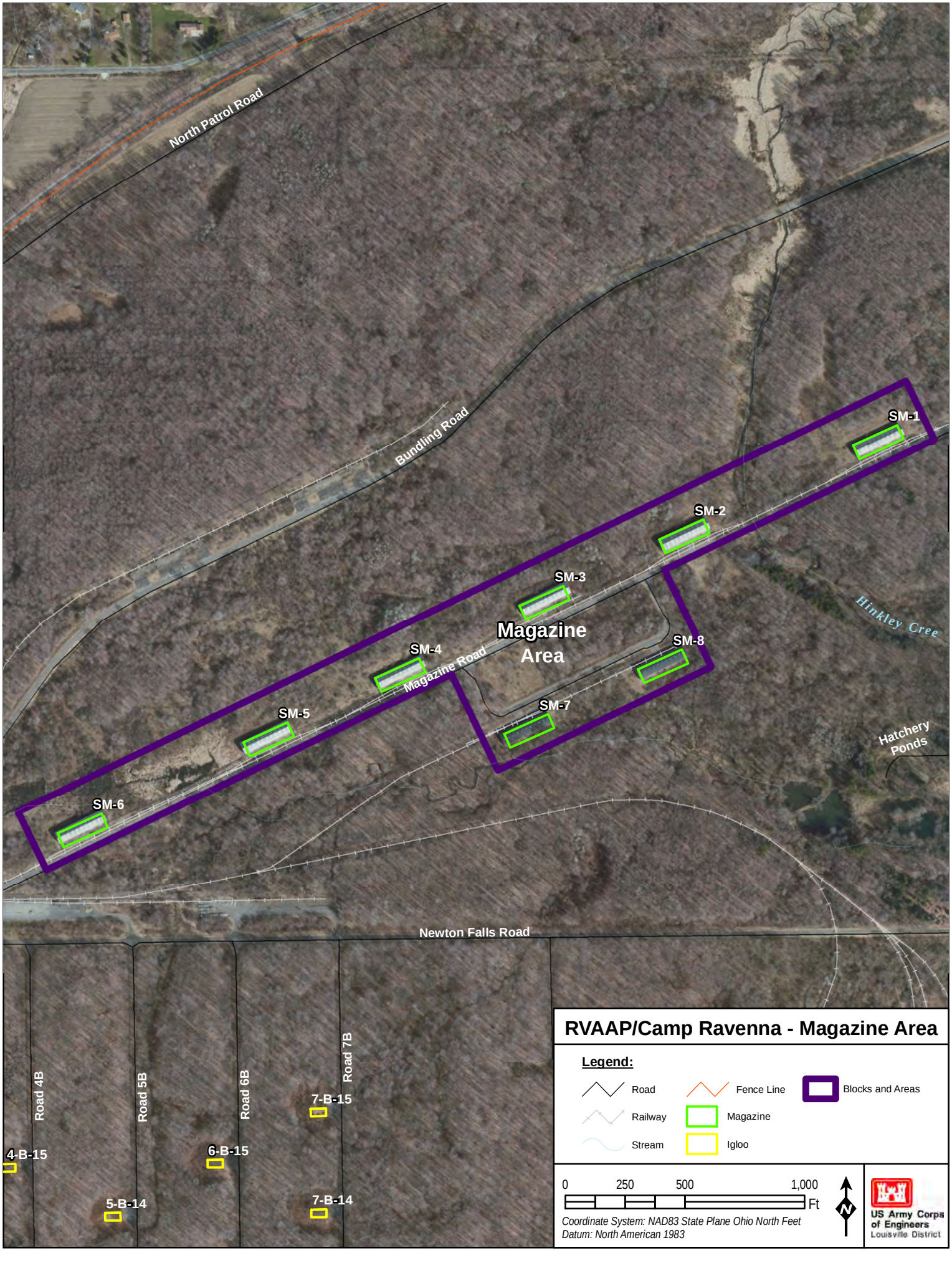
Coordinate System: NAD83 State Plane Ohio North Feet
Datum: North American 1983

US Army Corps of Engineers
Louisville District


P-117
Q-128
Pallet Road E East
Pallet Road D East
Pallet Road C East
Pallet Road B East
Winklepeck Road
Wilcox-Wayland Road
Sand Creek
Area 5
T-241
T-242
T-243
T-244
U-208
U-207
V-218
U-206
V-217
U-205
V-216
W-229
U-204
V-215
W-228
U-203
V-214
W-227
U-202
V-213
W-226
X-240
U-201
V-212
W-225
X-239
V-211
W-224
X-238
V-210
W-223
X-237
V-209
W-222
X-236
W-221
X-235
W-220
X-234
W-219
X-233
X-232
X-231
X-230
T-4101
Newton Falls Road
RVAAP/Camp Ravenna - Area 5
Legend:
Road
Fence Line
Blocks and Areas
Railway
Magazine
Stream
Igloo
0
400
800
1,600
Ft
N
Coordinate System: NAD83 State Plane Ohio North Feet
Datum: North American 1983
US Army Corps of Engineers
Louisville District


HH-371
HF-350
HD-331
HB-314
HG-360
HE-340
HC-322
HA-306
HH-370
HF-349
HD-330
HB-313
Smalley Road (C.H. 228)
HG-359
HE-339
HC-321
HA-305
HH-369
HF-348
HD-329
HB-312
HG-358
HE-338
HC-320
HA-304
HH-368
HF-347
HD-328
HB-311
HG-357
HE-337
HC-319
HA-303
HH-367
HF-346
Area 7
HD-327
HB-310
HG-356
HE-336
HC-318
HH-366
HF-345
HD-326
HB-309
HG-355
HE-335
HC-317
HA-301
HH-365
HF-344
HD-325
HB-308
HG-354
HE-334
HC-316
HA-300
HH-364
HF-343
HB-307
HG-353
HE-333
HF-342
HD-323
HG-352
HE-332
HH-362
HH-361
Smallsreed Road
RVAAP/Camp Ravenna - Area 7
Legend:
Road
Fence Line
Blocks and Areas
Railway
Magazine
Stream
Igloo
0
300
600
1,200
Ft
N
Coordinate System: NAD83 State Plane Ohio North Feet
Datum: North American 1983
US Army Corps of Engineers
Louisville District


Smalley Road (C.H. 228)
E Block
Road 1E
Road 2E
Road 3E
Road 4E
Road %e
Road 6E
Road 7E
George Road
Greenleaf Road
1-E-8
2-E-8
3-E-9
4-E-8
5-E-9
6-E-7
7-E-6
8-E-5
B-6
1-E-7
2-E-7
3-E-8
4-E-7
5-E-8
6-E-6
7-E-5
8-E-4
B-5
1-E-6
2-E-6
3-E-7
4-E-6
5-E-7
6-E-5
7-E-4
8-E-3
B-4
1-E-5
2-E-5
3-E-6
4-E-5
5-E-6
6-E-4
7-E-3
8-E-2
B-3
1-E-4
2-E-4
3-E-5
4-E-4
5-E-5
6-E-3
7-E-2
8-E-1
B-2
1-E-3
2-E-3
3-E-4
4-E-3
5-E-4
6-E-2
7-E-1
B-1
1-E-2
2-E-2
3-E-3
4-E-2
5-E-3
6-E-1
1-E-1
2-E-1
3-E-2
4-E-1
5-E-2
G-E-1
3-E-1
5-E-1
RVAAP/Camp Ravenna - E Block
Legend:
Road
Railway
Stream
Fence Line
Magazine
Igloo
Blocks and Areas
0
250
500
1,000
Ft
N
Coordinate System: NAD83 State Plane Ohio North Feet
Datum: North American 1983
US Army Corps of Engineers
Louisville District


North Patrol Road
Bundling Road
SM-1
SM-2
SM-3
SM-4
SM-5
SM-6
SM-7
SM-8
Magazine Area
Magazine Road
Hinkley Cree
Hatchery Ponds
Newton Falls Road
Road 4B
Road 5B
Road 6B
Road 7B
4-B-15
5-B-14
6-B-15
7-B-15
7-B-14
RVAAP/Camp Ravenna - Magazine Area
Legend:
Road
Railway
Stream
Fence Line
Magazine
Igloo
Blocks and Areas
0
250
500
1,000
Ft
N
Coordinate System: NAD83 State Plane Ohio North Feet
Datum: North American 1983
US Army Corps of Engineers
Louisville District


7-D-9


7·D·10



SECTION 4:

LETTERS AND DOCUMENTS FROM THE OHIO EPA REFERENCED IN THE HRRE

4.1 22 April 2014 Email from Ohio EPA Providing COmments on the Army's 16 April 2014 Presentation on the Revised Work Plan Approach for the Sampling and Analysis of the Storage Magazines on RVAAP

From: Netzly-Watkins, Susan [Susan.Netzly-Watkins@epa.ohio.gov]
Sent: Tuesday, April 22, 2014 7:39 AM
To: Merkel, Brett A CIV NG NGB (US); Sedlak, Kevin M CTR (US)
Cc: Zikmanis, Nancy; Beals, Rodney; Roope, Nicholas
Subject: Camp Ravenna - Igloo sampling feedback

Brett and Kevin,

Thank you for providing Ohio EPA with an overview on the proposed sampling activities of the earth covered magazines, above ground magazines and storage revetments on April 16th. We had a number of questions on the scope, selection strategy and sampling strategy that was outlined during our call. If you could please forward these comments on to the folks on your team that would need this information, we would appreciate it.

At this time Nancy Zikmanis has asked Nicholas Roope and I to take the lead on coordinating with you on the Igloo sampling.

The following seem to be key issues that have not been completely formulated to begin planning on this project:

1. What is the contamination we expect at these units and is there a way to screen them to see if there is potential for contamination at each area. There may be an option to use Nitrate screening for explosives to help determine releases. An option we can discuss further.
2. There are various structures used for storage which have different sampling needs. This may be something to consider when developing a strategy to sample and determine a sample population. A set sampling strategy may not work for all structural types so we will need to have this evaluated before we look at planning.
3. Funding issues may play a part in how many and what areas can be sampled. If the area is active and does not fall within the DERP funding, we may need to consider other options for these areas within the sampling plan.
4. We need to consider what would be an acceptable quantity of samples with and without screening options to ensure that unknowns are accounted for.
5. We need to discuss what is known and what is not known for each area. It seems that there must be at least a little information on some of these units and what the recent past of them is. There was discussion of soil moving and “patching” of berms so there must be some additional information on current uses, even if there is not a full history. This could help to identify some potential contamination.

We need to discuss what is known and what is not known for each area. It seems that there must be at least a little information on some of these units and what the recent past of them is. There was discussion of soil moving and “patching” of berms so there must be some additional information on current uses, even if there is not a full history. This could help to identify some potential contamination

e look forward to working with you on this.

Thanks!

Susan Netzly-Watkins
Northeast District Office
Division of Environmental Response and Revitalization
2110 East Aurora Rd., Twinsburg, OH 44087
Phone: (330) 963-1201
Fax: (330) 487-0769
susan.netzly-watkins@epa.ohio.gov

4.2 12 January 2015 Contact Report sent to USACE from the Ohio EPA Regarding their 3 July 2014 Meeting with Eileen Mohr (former Site Coordinator and PM for the Ohio EPA) Highlighted INFORMATION was included in the Contact Report but Appears to be From a Draft Letter to the Army that was never Sent

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program
Portage/Trumbull Counties, Ohio
Storage Magazines/Igloos Investigation
Ohio EPA ID# 267-000859-059

Date: July 3, 2014
==========

On June 23, 2014, Susan Netzly-Watkins and Nicholas Roope, Ohio EPA, met with Ms. Eileen Mohr at the Twinsburg Library to discuss previous operations with the Army National Guard at the Ravenna Arsenal involving the earth-covered storage magazines (Igloos).

Igloos – Background and Determining if the Storage Magazines are an AOC
In 2008, Eileen recalled asking the US Army Corp of Engineers to begin evaluating the storage magazines which include the earth covered magazines, above ground magazines and storage revetments. Eileen indicated she was concerned that IRP and MMRP stored in these areas may have entered the environment. The assessment of the igloos did not occur as quickly as Ohio EPA may have anticipated. Due to the large area that the igloo blocks cover on the RVAAP, the Army cited a lack of funding as the primary reason sampling had not occurred more quickly.

During the June 23, 2011 TIGER meeting, the Army and Ohio EPA settled on a path forward for assessment of the igloo blocks. Two conditions would need to be met if the igloos would be deemed an AOC.

- First, determine if and how other Army installations addressed storage magazines. Determine if there was a precedent for the assessment of igloos and how that assessment was undertaken.
- Second, determine if there was documentation of a release at the Ravenna Igloos.

If these two conditions were met, the Igloo Blocks would be deemed and AOC and sampling would be done throughout all the igloos.

Were other Army installation magazines investigated?
It has since been shown that other Army installations with storage magazines have undergone environmental sampling. The sampling strategies applied at these installations haven't always been the same. Ft. Wingate collected samples at 100% of its storage magazines. This installation however was slated for residential reuse. Other installations where magazines were sampled include Joliet and Lexington.
Thus the first condition of designating the RVAAP igloo blocks as an AOC appears to have been met.

Has there been a release of a CERCLA hazardous substance?
Around 2010, the Army Corp of Engineers was considering using some of the igloos as Ammunition Supply Points (ASPs) and also for tornado shelters. The interest in reusing some of these shelters sparked renewed interest in evaluating the igloos. The environmental history

and conditions of these areas were evaluated and some testing was conducted on the igloos that were deemed to be “best of the best” for potential reuse.

A November 2010 US Army Corp of Engineers report titled, “Field Evaluation of Selected Decommissioned Munitions Storage Igloos” contains a detailed list of what was stored in blocks of igloos.

In a memo dated August 4, 2011 from Jim McGee, a former VISTA employee noted the available information from researching and interviewing key people to identify what each of the storage buildings uses had been.

Eileen noted that Colonel Tadsen had left his post at RVAAP before all of the sampling started. Jim McGee supplied most of the historical information involving what was stored in the igloos and what maintenance was done to the igloos. If additional information regarding the igloos is needed, Eileen recommends checking in with Derek Kindler and Tom Chanda. They may have historical records of the igloos. Eileen also identified the Historical Society of Newton Falls and the Historical Society of Portage County as likely repositories of some historical records from the RVAAP.

Eileen noted that there was a master key available for all of the igloos, she was able to visual inspect the interior of a number of them in 2013.

Fence around Block C
We asked Eileen if she know why there’s a fence around igloos in C block. None of the other igloos were fenced. Eileen recalled that the fence may have been installed around Block C due to the storage of MEC from other projects. Explosive hazardous materials may have been contained in this area and RCRA requirements prompted the placement of the fence.

All information from this point on in the Contact Report was deleted since it was not part of the actual Contact Report.

4.3 23 June 2011 Email Exchange between USACE and Army Regarding Preliminary Results From High Priority Igloo Investigation and the Ohio EPA's Opinion to Make the Igloos and AOC COnsidering these Preliminary Results at RVAAP and the Precedence for Igloo AOCs on Fort Wingate

From: Mohr, Eileen [eileen.mohr@epa.state.oh.us]
Sent: Thursday, June 23, 2011 1:17 PM
To: Kinder, Derek S LRL; christy.esler@us.army.mil; mark.c.patterson@us.army.mil; mark.h.eldridge@us.army.mil; kathryn.s.tait@us.army.mil; timothy.m.morgan@us.army.mil; Beckham, Glen LRL; Moore, Gregory F LRL; william.meade1@oh.ngb.army.mil
Cc: Fisher, Todd; Mohr, Eileen; Beals, Rod; Eberle, Mike; Burke, Justin
Subject: Igloo Sampling Results (UNCLASSIFIED)/Need to Designate as AOCs
Attachments: Re: C-Block Igloo Sampling Results and Findings (UNCLASSIFIED); RE: C-Block Igloo Sampling Results and Findings (UNCLASSIFIED); C-Block Igloo Sampling Results and Findings (UNCLASSIFIED)

All:

I have tried to capture the initial recipients on the various emails regarding the initial igloo results. I also added in a few folks. If I have missed anyone, please feel free to forward this email. It contains a number of emails as well as data from the sampling performed at the proposed ASPs and the sampling map.
OHARNG: Please forward to NGB if needed.
I had previously commented on the data on February 28, 2011 from the 5 igloos that were sampled.
However, looking at the data for the proposed ASPs again brings up an issue that has been on the table for minimally three years. That is: how to deal with the igloos: Earth Covered Magazines (ECMs) and Above Ground Magazines (AGMs).

I had asked several times over the past several years during Installation Action Plan (IAP) meetings and other meetings that the igloos be designated as AOCs. AEC in the past raised two issues to this request: the issue of setting precedence; and lack of data to show that there may have been a release in these areas.

PRECEDENCE ISSUE: I have indicated previously that precedence had already been set at (minimally) at Volunteer Army Ammunition Plant (VAAP) and Ft. Wingate. At VAAP: the 2001 IAP indicates that there were 2 AOCs (VAAP-005 and VAAP-006). The 2010 VAAP IAP indicated that $184 K was spent at VAAP-005; and TBD at VAAP-006. The table of contents for the FY2010 Ft Wingate IAP indicates that there are a number of igloo blocks that are being investigated under the IRP. So the precedence issue has put to rest.

RELEASE ISSUE: The second issue was lack of confirmation of a release. The data sheet summary for the 5 igloos sampled indicate the presence of: 2, 4, 6 - Trinitrotoluene; HMX; and RDX. We now have a confirmed release of site related contaminants (SRCs).

As such, the Ohio EPA re-iterates the need to discuss the time frame for designating the igloos (ECMs and AGMs) as AOCs. The issue of whether or not they should be designated as AOCs is not in question, as the two "stumbling blocks" identified by the ARmy to designating them as AOCs have already been overcome by Army actions at other installations and at RVAAP. As the

Ohio EPA has been more than patient regarding this issue, we expect that this issue will take a high priority with the Army.

Please contact me with a time frame to continue this discussion.

Thanks.

Eileen

_____
From: Kinder, Derek S LRL [Derek.S.Kinder@usace.army.mil]
Sent: Monday, June 20, 2011 11:55 AM
To: Mohr, Eileen
Subject: RE: Igloo Sampling Results (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Eileen,

Please find emails attached where we had sent results of sampling at select c-block igloos and your responses then my responses back to them. These are the only igloos we have sampled to date.

We are working this week to finalize our inspection document where we went to the high priority igloos and completed inspections/took pictures and used that to choose which igloo within each proximity grouping had the highest probability of being contaminated. This document is a couple of weeks behind our original schedule but me and Tom are working to get that document to you this week. Once this document is reviewed and we reach approval that will give us the green light to complete the remainder of the sampling.

If you have any more questions please let me know.

Thanks,

Derek Kinder, PE
Civil/Environmental Engineer
Environmental Branch
Louisville District
US Army Corps of Engineers
502-315-6393
Comments on our Environmental Services are invited:
http://ice.disa.mil/index.cfm?fa=card&site_id=915&service_provider_id=115446

-----Original Message-----
From: Mohr, Eileen [mailto:eileen.mohr@epa.state.oh.us]
Sent: Monday, June 20, 2011 11:32 AM
To: Kinder, Derek S LRL

Cc: Mohr, Eileen
Subject: Igloo Sampling Results

Hi Derek:
I can't remember if I received the igloo sampling results yet.

If you sent them to me previously... I have no clue where they are since we changed email systems. Could you please re-send?
Thanks!

Eileen

SECTION 5:

SUMMARY TABLES AND INFORMATION FROM THE HIGH PRIORITY IGLOO INVESTIGATION

Table 1
Summary of Detected Constituents and Screening of High Priority Igloo Sampling
Explosives and Propellants Surface Soil and Sediment
Ravenna Army Ammunition Plant, Ravenna, Ohio

					1,3,5-Trinitrobenzene	1,3-Dinitrobenzene	2,4,6-Trinitrotoluene	2,6-Dinitrotoluene	2-Nitrotoluene	3-Nitrotoluene	HMX	Nitrocellulose	Nitroglycerin	Nitroguanidine	RDX
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				National Guard FWCUG (HI=0.1 or 10^{-6})	16542 NGT	59.6 NGT	249 NGT	13.6 NGT	72.6 NGT		23464 NGT		982 NGT		1711 NGT
				Resident Adult FWCUG (HI=0.1 or 10^{-6})	1528	5.95	21.1	0.769	6.03		1909		81.6		11.5
				Residential Soil RSL (HI=0.1 or 10^{-6})						0.62		18000000		620	
Block	**Igloo Number**	**Sample ID**	**Media**	**Collection Date**											
B	6B4	IGBSS-001M-0001-SO	SO	9/13/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.29 P	0.14 U
	7B3	IGBSS-004M-0001-SO	SD	9/13/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.16 J	0.14 U
C	1C3	IGCSD-017M-0001-SD	SD	9/13/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	23 J	0.5 U	0.37	0.14 U
	1C3	IGCSS-016M-0001-SO	SO	9/13/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.37	0.14 U
	1C5	IGCSD-021M-0001-SD	SD	9/13/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.21 J	0.14 U
	1C5	IGCSD-021M-0002-SD	SD	9/13/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.33	0.14 U
	1C5	IGCSS-019M-0001-SO	SO	9/13/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.16 J	0.14 U
	1C5	IGCSS-019M-0002-SO	SO	9/13/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.44	0.14 U
	3C7	IGCSD-026M-0001-SD	SD	9/13/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	24 J	0.5 U	0.37	0.14 U
	3C7	IGCSS-025M-0001-SO	SO	9/13/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.15 J	0.14 U
	3C11	IGCSD-029M-0001-SD	SD	9/13/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U,M	1.8 J	0.18 J,P	0.14 U
	6C1	IGCSD-006M-0001-SD	SD	9/13/2011	0.13 U	0.079 U	0.089 U	0.069 U	0.089 U	0.069 U	0.12 U	13 U	0.5 U	0.18 J	0.14 U
	6C1	IGCSS-001M-0001-SO	SO	1/26/2011	0.5 U	0.4 U	0.4 U	0.25 U	0.5 U	0.25 U	0.4 U	100 U	2 U	0.3 P	0.5 U
	6C2	IGCSS-002M-0001-SO	SO	1/26/2011	0.5 U	0.4 U	0.4 U	0.25 U	0.5 U	0.25 U	0.4 U	100 U,M	2 U	0.46 P	0.5 U
	6C2	IGCSS-002M-0002-SO	SO	1/26/2011	0.5 U	0.4 U	0.4 U	0.25 U	0.5 U	0.25 U	0.4 U	100 U	2 U	0.34 P	0.5 U
	6C3	IGCSD-010M-0001-SD	SD	9/14/2011	0.13 U	0.08 U	0.09 U	0.07 U	1.5	0.07 U	0.12 U	13 U	0.5 U	0.25	0.14 U
	6C3	IGCSS-003M-0001-SO	SO	1/26/2011	0.5 U	0.4 U	3.5	0.25 U	0.5 U	0.25 U	1.5	100 U	2 U	0.3 P	9.1
	6C4	IGCSS-004M-0001-SO	SO	1/26/2011	0.5 U	0.4 U	0.4 U	0.25 U	0.5 U	0.25 U	0.4 U	100 U	2 U	0.28 P	0.5 U
	6C4	IGCSD-012M-0001-SD	SD	9/14/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.5	0.14 U
	6C5	IGCSD-014M-0001-SD	SD	9/14/2011	0.13 U	0.079 U	0.089 U	0.069 U	0.089 U	0.069 U	0.12 U	13 U	0.5 U	0.23	0.14 U
	6C5	IGCSS-005M-0001-SO	SO	1/26/2011	0.5 U	0.4 U	0.4 U	0.25 U	0.5 U	0.25 U	0.4 U	100 U	2 U	0.26 P	0.5 U
	7C3	IGCSD-033M-0001-SD	SD	9/14/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.37	0.14 U
	7C3	IGCSD-033M-0002-SD	SD	9/14/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.31	0.14 U
	7C3	IGCSS-031M-0002-SO	SO	9/14/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.16 J	0.14 U
D	3D1	IGDSD-002M-0001-SD	SD	9/14/2011	0.13 U	0.08 U	0.089 U	0.07 U	0.089 U	0.07 U	0.12 U	13 U	0.5 U	0.28	0.14 U
	3D1	IGDSS-001M-0001-SO	SO	9/14/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.16 J	0.14 U
	5D1	IGDSD-005M-0001-SD	SD	9/14/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.18 J	0.14 U
	6D1	IGDSD-008M-0001-SD	SD	9/14/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.15 J	0.14 U
	6D1	IGDSS-007M-0001-SO	SO	9/14/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.17 J	0.14 U
	7D3	IGDSD-011M-0001-SD	SD	9/14/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.23	0.14 U
	7D3	IGDSS-010M-0001-SO	SO	9/14/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.31 P	0.14 U
	7D7	IGDSD-014M-0001-SD	SD	9/14/2011	0.13 U	0.079 U	0.089 U	0.069 U	0.089 U	0.069 U	0.12 U	13 U	0.5 U	0.12 J	0.14 U
	7D7	IGDSS-013M-0001-SO	SO	9/14/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.21 J	0.14 U
J	J67	IGJSD-002M-0001-SD	SD	9/15/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.28	0.14 U
L	L84	IGLSD-002M-0001-SD	SD	9/15/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.3	0.14 U
P	P126	IGPSD-008M-0001-SD	SD	9/13/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.66	0.14 U
Q	Q133	IGQSS-004M-0002-SO	SO	9/14/2011	0.35 J	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.06 U	0.14 U
7	HA306	IG7SD-002M-0001-SD	SD	9/14/2011	2.6 P	0.079 U	0.089 U	8.6	0.089 U	0.22 J	0.12 U	13 U	0.5 U	0.06 U	0.14 U
	HB312	IG7SD-005M-0001-SD	SD	9/14/2011	0.13 U	0.079 U	0.089 U	0.07 U	0.089 U	0.07 U	0.12 U	13 U	0.5 U	0.66 P	0.14 U
	HA306	IG7SS-001M-0001-SO	SO	9/14/2011	0.13 U	0.13 J,P	0.089 U	0.069 U	0.089 U	0.069 U	0.12 U	13 U	0.5 U	0.061 U	0.14 U
	HB312	IG7SS-004M-0001-SO	SO	9/14/2011	0.13 U	0.079 U	0.089 U	8.3 P	0.089 U	0.069 U	0.12 U	13 U	0.5 U	0.19 J	0.14 U

Notes:

J	Estimated Value
M	Matrix spike and/or Matrix Spike Duplicate recovery outside acceptance limits
P	Concentration of analyte differs more than 40% between primary and confirmation analysis
U	Analyte concentration was below detection limit
RSL	Regional Screening Level
	Value exceeds National Guard & Resident Adult FWCUGs

Table 1
Summary of Detected Constituents and Screening of High Priority Igloo Sampling
Explosives and Propellants Surface Soil and Sediment
Ravenna Army Ammunition Plant, Ravenna, Ohio

					1,3,5-Trinitrobenzene	1,3-Dinitrobenzene	2,4,6-Trinitrotoluene	2,6-Dinitrotoluene	2-Nitrotoluene	3-Nitrotoluene	HMX	Nitrocellulose	Nitroglycerin	Nitroguanidine	RDX
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				National Guard FWCUG (HI=1 or 10^{-5})	165422 NGT	596 NGT	2488 NGT	136 NGT	726 NGT		234645 NGT		9818 NGT		1452 NGT
				Resident Adult FWCUG (HI=1 or 10^{-5})	15280	59.4	211	7.69	60.3		19090		816		115
				Residential Soil RSL (HI=1 or 10^{-5})						6.2		180000000		6200	
Block	**Igloo Number**	**Sample ID**	**Media**	**Collection Date**											
B	6B4	IGBSS-001M-0001-SO	SO	9/13/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.29 P	0.14 U
	7B3	IGBSS-004M-0001-SO	SD	9/13/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.16 J	0.14 U
C	1C3	IGCSD-017M-0001-SD	SD	9/13/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	23 J	0.5 U	0.37	0.14 U
	1C3	IGCSS-016M-0001-SO	SO	9/13/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.37	0.14 U
	1C5	IGCSD-021M-0001-SD	SD	9/13/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.21 J	0.14 U
	1C5	IGCSD-021M-0002-SD	SD	9/13/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.33	0.14 U
	1C5	IGCSS-019M-0001-SO	SO	9/13/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.16 J	0.14 U
	1C5	IGCSS-019M-0002-SO	SO	9/13/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.44	0.14 U
	3C7	IGCSD-026M-0001-SD	SD	9/13/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	24 J	0.5 U	0.37	0.14 U
	3C7	IGCSS-025M-0001-SO	SO	9/13/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.15 J	0.14 U
	3C11	IGCSD-029M-0001-SD	SD	9/13/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U,M	1.8 J	0.18 J,P	0.14 U
	6C1	IGCSD-006M-0001-SD	SD	9/13/2011	0.13 U	0.079 U	0.089 U	0.069 U	0.089 U	0.069 U	0.12 U	13 U	0.5 U	0.18 J	0.14 U
	6C1	IGCSS-001M-0001-SO	SO	1/26/2011	0.5 U	0.4 U	0.4 U	0.25 U	0.5 U	0.25 U	0.4 U	100 U	2 U	0.3 P	0.5 U
	6C2	IGCSS-002M-0001-SO	SO	1/26/2011	0.5 U	0.4 U	0.4 U	0.25 U	0.5 U	0.25 U	0.4 U	100 U,M	2 U	0.46 P	0.5 U
	6C2	IGCSS-002M-0002-SO	SO	1/26/2011	0.5 U	0.4 U	0.4 U	0.25 U	0.5 U	0.25 U	0.4 U	100 U	2 U	0.34 P	0.5 U
	6C3	IGCSD-010M-0001-SD	SD	9/14/2011	0.13 U	0.08 U	0.09 U	0.07 U	1.5	0.07 U	0.12 U	13 U	0.5 U	0.25	0.14 U
	6C3	IGCSS-003M-0001-SO	SO	1/26/2011	0.5 U	0.4 U	3.5	0.25 U	0.5 U	0.25 U	1.5	100 U	2 U	0.3 P	9.1
	6C4	IGCSS-004M-0001-SO	SO	1/26/2011	0.5 U	0.4 U	0.4 U	0.25 U	0.5 U	0.25 U	0.4 U	100 U	2 U	0.28 P	0.5 U
	6C4	IGCSD-012M-0001-SD	SD	9/14/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.5	0.14 U
	6C5	IGCSD-014M-0001-SD	SD	9/14/2011	0.13 U	0.079 U	0.089 U	0.069 U	0.089 U	0.069 U	0.12 U	13 U	0.5 U	0.23	0.14 U
	6C5	IGCSS-005M-0001-SO	SO	1/26/2011	0.5 U	0.4 U	0.4 U	0.25 U	0.5 U	0.25 U	0.4 U	100 U	2 U	0.26 P	0.5 U
	7C3	IGCSD-033M-0001-SD	SD	9/14/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.37	0.14 U
	7C3	IGCSD-033M-0002-SD	SD	9/14/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.31	0.14 U
	7C3	IGCSS-031M-0002-SO	SO	9/14/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.16 J	0.14 U
D	3D1	IGDSD-002M-0001-SD	SD	9/14/2011	0.13 U	0.08 U	0.089 U	0.07 U	0.089 U	0.07 U	0.12 U	13 U	0.5 U	0.28	0.14 U
	3D1	IGDSS-001M-0001-SO	SO	9/14/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.16 J	0.14 U
	5D1	IGDSD-005M-0001-SD	SD	9/14/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.18 J	0.14 U
	6D1	IGDSD-008M-0001-SD	SD	9/14/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.15 J	0.14 U
	6D1	IGDSS-007M-0001-SO	SO	9/14/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.17 J	0.14 U
	7D3	IGDSD-011M-0001-SD	SD	9/14/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.23	0.14 U
	7D3	IGDSS-010M-0001-SO	SO	9/14/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.31 P	0.14 U
	7D7	IGDSD-014M-0001-SD	SD	9/14/2011	0.13 U	0.079 U	0.089 U	0.069 U	0.089 U	0.069 U	0.12 U	13 U	0.5 U	0.12 J	0.14 U
	7D7	IGDSS-013M-0001-SO	SO	9/14/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.21 J	0.14 U
J	J67	IGJSD-002M-0001-SD	SD	9/15/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.28	0.14 U
L	L84	IGLSD-002M-0001-SD	SD	9/15/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.3	0.14 U
P	P126	IGPSD-008M-0001-SD	SD	9/13/2011	0.13 U	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.66	0.14 U
Q	Q133	IGQSS-004M-0002-SO	SO	9/14/2011	0.35 J	0.08 U	0.09 U	0.07 U	0.09 U	0.07 U	0.12 U	13 U	0.5 U	0.06 U	0.14 U
7	HA306	IG7SD-002M-0001-SD	SD	9/14/2011	2.6 P	0.079 U	0.089 U	8.6	0.089 U	0.22 J	0.12 U	13 U	0.5 U	0.06 U	0.14 U
	HA306	IG7SS-001M-0001-SO	SD	9/14/2011	0.13 U	0.13 J,P	0.089 U	0.069 U	0.089 U	0.069 U	0.12 U	13 U	0.5 U	0.061 U	0.14 U
	HB312	IG7SD-005M-0001-SD	SO	9/14/2011	0.13 U	0.079 U	0.089 U	0.07 U	0.089 U	0.07 U	0.12 U	13 U	0.5 U	0.66 P	0.14 U
	HB312	IG7SS-004M-0001-SO	SO	9/14/2011	0.13 U	0.079 U	0.089 U	8.3 P	0.089 U	0.069 U	0.12 U	13 U	0.5 U	0.19 J	0.14 U

Notes:

J	Estimated Value
M	Matrix spike and/or Matrix Spike Duplicate recovery outside acceptance limits
P	Concentration of analyte differs more than 40% between primary and confirmation analysis
U	Analyte concentration was below detection limit
RSL	Regional Screening Level
	Value exceeds Resident Adult FWCUG

Table 4A
Summary of Detected Constituents and Screening of High Priority Igloo Sampling
Inorganics Surface Soil and Sediment
Ravenna Army Ammunition Plant, Ravenna, Ohio

					Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Trivalent Chromium	Cobalt	Copper	Hexavalent Chromium	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				National Guard FWCUG (HI=0.1 or 10^{-6})	17700 BKG	175 NGT	15.4 BKG	351 NGT		10.9 NGT	Essential	329763 NGT	10.4 BKG	25368 NGT	1.64 NGT	184370 NGT		Essential	1450 BKG	172 NGT	12639 NGT	Essential		3105 NGT	Essential	47.7 NGT	2304 NGT	187269 NGT
				Resident Adult FWCUG (HI=0.1 or 10^{-6})	52923	13.6	1.54	8966		22.3	Nutrient	19694	803	2714	90.4	19010		Nutrient	1482	16.5	1346	Nutrient		324	Nutrient	4.76	156	19659
				Residential Soil RSL (HI=0.1 or 10^{-6})					16								400						39					
Block	Igloo Number	Sample ID	Media	Collection Date																								
B	6B4	IGBSS-001M-0001-SO	SS	9/13/2011	9450	4	14	83.8	0.58	0.57	5360	183	9.1	18.2	<10 U	21700	84.5	2350	730	0.03	23.5	1200	0.46 B	<0.1 U	60	0.26 J	13.3	87.1
	6B4	IGBSD-002M-0001-SD	SD	9/13/2011	11100	3	15	79.9	0.65	0.29	6150	120	8.8	21.9	<10 U	22000	18.9	2910	605	0.026	19.8	1100	0.19 JB	<0.1 U	81.5	0.21 J	15.1	57.7
	7B3	IGBSS-004M-0001-SO	SS	9/13/2011	8820	0.21 J	14.5	65.5	0.47	0.32	5170	21.3	7.2	17.7	<10 U	18800	71.4	2410	573	0.028	23.2	678	0.44 B	<0.1 U	31.9	0.22 J	15.3	78.5
	7B3	IGBSD-005M-0001-SD	SD	9/13/2011	7940	0.68	11	89.4	0.52	0.35	4520	189	8.7	17.8	<10 U	19700	17.1	1320	871	0.043	20.5	1040	0.77 B	0.071	78.1	0.27	9.7	68.6
C	6C1	IGCSS-001M-0001-SO	SS	1/26/2011	13600 V,B	0.76 J,V	<4.6 U,V	101 V	0.62	0.66	15600 V,B	55.5	8.8	27.8	<6.5 U	23800	49.6	4540 V,B	4350	0.029	25.2 V	994	<2.1 U,V	<1.1 U,V	426	0.62 J,V	18	97.1 V
	6C1	IGCSD-006M-0001-SD	SD	9/13/2011	9540	0.92	9	76.7	0.64	0.35	12400	164	6.7	12.9	2.9 J	19600	16.3	3210	438	0.032	17.2	1460	0.66	<0.1 U	74.9	0.12 J	14.7	52.8
	6C2	IGCSS-002M-0001-SO	SS	1/26/2011	13100 B	1.7 V	2.2 J,V	106	0.68	1.4 M	8530 B	145 M	9.7	27.9	<6.5 U,M	24100 M	78.7 M	3410 B	925	0.031	27.4	1530	<2.1 U,V	<1.1 U,M	423 M	0.96 M	19	76.3 M
	6C2	IGCSS-002M-0002-SO	SS	1/26/2011	13400 V,B	0.98 J,V	0.71 J,V	116 V	0.65	1	9440 V,B	85.4	9.4	19.9	<6.5 U	24200	54	3450 V,B	1030	0.025	24.8	1100	<2.1 U,V	<1.1 U,V	431	1.4 V	18	75.2 V,B
	6C2	IGCSD-008M-0001-SD	SD	9/13/2011	12500	1	9.9	101	0.77	0.24	10200	40.3	8.8	14.9	<11 U	24800	15.5	3770	440	0.027	22.4	1710	0.78	<0.1 U	78.1	0.23 J	15.5	60.5
	6C3	IGCSS-003M-0001-SO	SS	1/26/2011	15800	<2.7 U,V	<4.6 U,V	119	0.72	0.66	9480	29.5	10.1	17.7	<6.5 U	23800	43.4	3940	1040	0.035	24.3	938	<2.1 U,V	<1.1 U,V	376	0.77 V	18.8	81 B
	6C3	IGCSD-010M-0001-SD	SD	9/14/2011	13400	0.23 J	12	127	0.75	0.32	18000	88	11.2	20.4	<10 U	23600	13.4	5440	501	0.019	27	1850	0.3 B	<0.1 U	86	0.21 J	17.6	56.7
	6C4	IGCSS-004M-0001-SO	SS	1/26/2011	11000	<2.7 U,V	2 J,V	84.6	0.58	1.2	4680	23	8.3	16.5	<6.5 U	20900	31.5	2420	844	0.036	20.8	718	<2.1 U,V	<1.1 U,V	315	0.59 J,V	18.9	64.1 B
	6C4	IGCSD-012M-0001-SD	SD	9/14/2011	12400	0.32 J	9.4	93.9	0.59	0.3	6190	139	8.4	14	<9.8 U	20700	16.3	2480	542	0.032	17.1	1530	0.46 B	<0.1 U	72.9	0.24 J	18.3	50.3
	6C5	IGCSS-005M-0001-SO	SS	1/26/2011	9600	0.44 J,V	3.6 V	70.8	0.48	0.9	4360	55	6.9	16.3	<6.5 U	19800	80.5	2000	748	0.033	20.4	578	<2.1 U,V	<1.1 U,V	332	0.56 J,V	16.6	60.4 B
	6C5	IGCSD-014M-0001-SD	SD	9/14/2011	1000	0.69	12.7	80.5	0.51	0.3	3640	297	7.6	17.6	<10 U	19400	16.9	1520	482	0.033	16.4	1280	0.92	<0.1 U	94.6	0.17 J	17.8	47.7
	1C3	IGCSS-016M-0001-SO	SS	9/13/2011	10100	0.77	11.3	103	0.62	0.46	5620	237	8.3	15.9	<9.9 U	17900	73	1610	984	0.04	18.6	969	0.69 B	<0.1 U	67.4	0.27	14.8	84.2
	1C3	IGCSD-017M-0001-SD	SD	9/13/2011	7980	0.79	12.6	62.7	0.44	0.38	4280	285	6.4	15.3	<9.9 U	17300	41.8	1350	545	0.036	18.8	856	0.59 B	<0.1 U	55.6	0.25 J	15.3	62.2
	1C5	IGCSS-019M-0001-SO	SS	9/13/2011	4910 B	2.4	13.4	63.4	0.43	0.75	2530	214	7	17.1	<9.4 U	17900	84.5	1720	568	0.034	19.1	939	0.35	<0.1 U	46.8	0.35	13.6	107
	1C5	IGCSS-019M-0002-SO	SS	9/13/2011	7360	0.88	12.3	63.6	0.45	0.49	5040	265	6.6	17	<10 U	17600	83.2	1400	565	0.038	17.3	978	0.35 B	<0.1 U	56.3	0.26 J	12.8	92.2
	1C5	IGCSD-021M-0001-SD	SD	9/13/2011	6490 B	2.2	9.7	64.6	0.52	0.54	4880	200	6.4	12.6	<10 U	13200	24.9	1400	674	0.053	13.7	582	0.93	<0.1 U	39.2	0.36	12.5	62.6
	1C5	IGCSD-021M-0002-SD	SD	9/13/2011	6960	0.47	9.9	70.7	0.56	0.34	6730	149	5.5	12.7	<9.9 U	13600	24.5	1420	732	0.047	13.4	571	1.1	<0.1 U	38.8	0.18 J	12.4	59.9
	3C7	IGCSS-025M-0001-SO	SS	9/13/2011	10100 B	2.2	13.8	94	0.56	0.93	5250	189	11.9	16.7	<10 U	19500	59.4	2360	833	0.037	18.8	1090	0.18 J	<0.1 U	62.4	0.46	15.4	111
	3C7	IGCSD-026M-0001-SD	SD	9/13/2011	7620 B	2.5	15.1	63.1	0.53	0.76	10900	247	8.4	20.4	<10 U	18700	22.5	4420	552	0.038	19.9	1090	0.13 J	<0.1 U	74.9	0.29	12.8	77.5
	3C11	IGCSS-028M-0001-SO	SS	9/13/2011	9680 B	0.5	13.3	98.1	0.53	0.66	2990	21.4	10.6	16	<10 U	18300	42.4	1330	1000	0.037	17	631	0.47	<0.1 U	23.6	0.51	15.7	70.2
	3C11	IGCSD-029M-0001-SD	SD	9/13/2011	9230 B,M	<0.82 U	15	66.3	0.51	0.16	4740 M	23.1 M	7.2	15.9	<10 U,M	19100 M	14.7	2200 B,M	615 M	0.029	15.7 M	594	0.54 B	<0.1 U	31.4	0.22 J,M	15 M	52.8 M
	7C3	IGCSS-031M-0001-SO	SS	9/14/2011	12000	0.48	13.6	108	0.65	0.81	5010	134	10	18.3	2.7 J,M	21100	94.7	2150	919	0.034	21	1330	0.52 B	<0.1 U	59.5	0.28	17.9	93
	7C3	IGCSS-031M-0002-SO	SS	9/14/2011	11900	0.74	14	110	0.65	0.83	4660	193	10	18.8	3.2 J	21200	95.2	2080	917	0.036	20.9	1370	0.32 B	0.017 U	65.6	0.23 J	17.7	95.2
	7C3	IGCSD-033M-0001-SD	SD	9/14/2011	12700	0.24 J	12.8	101	0.69	0.4	18700	107	9.6	18	4 J	20100	18.3	3240	635	0.03	20.2	1660	0.91	<0.1 U	74.2	0.25 J	17.3	54.1
	7C3	IGCSD-033M-0002-SD	SD	9/14/2011	10700 B	1.1	10.3	81.5	0.59	0.21	15400	107	8	16.4	3.2 J	21900	15.1	3180	514	0.033	16.4	1590	1.1	<0.1 U	63.6	0.23 J	13.8	45.6
D	3D1	IGDSS-001M-0001-SO	SS	9/14/2011	11300	0.69	13.6	85	0.66	1.3	10300	21.3	9.9	21.6	<10 U	23200	69.8	3440	554	0.028	20.1	1240	0.34	<0.1 U	49.8	0.19 J	14.7	98
	3D1	IGDSD-002M-0001-SD	SD	9/14/2011	11500	0.35 J	13.8	85.8	0.62	0.49	10900	22.6	12.1	25.4	<10 U	24200	13.6	4830	465	0.018	24	1190	0.076 J	<0.1 U	51.9	0.17 J	14.9	58.1
	5D1	IGDSS-004M-0001-SO	SS	9/14/2011	11000 B	1.1	11.2	91	0.81 Y	0.3	19200 Y,M	15.8	6.7	18.1	<10 U	22100 M	45.1	3620	678 M	0.026	13.7 M	1070	0.91	<0.1 U	79.8	0.32	13.6 M	69.6 M
	5D1	IGDSD-005M-0001-SD	SD	9/14/2011	7680 B	0.81	8.8	50.3	0.35	0.17	3020	24.3	5	9.5	<9.9 U	17000	10.2	1690	286	0.03	10.7	915	0.65	<0.1 U	35.3	0.12 J	13.7	44.6
	6D1	IGDSS-007M-0001-SO	SS	9/14/2011	7340 B	0.87	8.8	60.9	0.4	0.44	4330	54	5.9	11.9	<10 U	17400	50.5	1660	469	0.039	11.5	917	0.5	<0.1 U	23.5	0.2 J	12.6	71.4
	6D1	IGDSD-008M-0001-SD	SD	9/14/2011	11400	0.2 J	13.7	79.5	0.61	0.15	3220	59.4	9.5	19.8	<10 U	23000	15.6	2460	391	0.027	20.2	1240	0.32 B	<0.1 U	37.6	0.18 J	15.4	56.1
	7D3	IGDSS-010M-0001-SO	SS	9/14/2011	8550	0.98	11.2	74	0.47	0.51	4550	208	7.4	18.9	<10 U	19500	66.6	1840	448	0.023	16.7	1280	0.4 B	<0.1 U	50.6	0.24 J	14.7	77.8
	7D3	IGDSD-011M-0001-SD	SD	9/14/2011	10500	<0.83 U	12.6	62.8	0.5	0.12	2990	20.8	8.2	13.7	<10 U	20700	14.7	1990	451	0.027	17.2	909	0.89	<0.1 U	29.9	0.18 J	15.7	44.5
	7D7	IGDSS-013M-0001-SO	SS	9/14/2011	11000	0.76	15	91.5	0.71	0.52	17200	112	8.2	22.8	<10 U	21400	118	4040	754	0.022	19.5	1290	0.36 B	<0.1 U	83.1	0.18 J	13.1	122
	7D7	IGDSD-014M-0001-SD	SD	9/14/2011	10300	0.32 J	11.4	80.2	0.65	0.24	12000	103	7.8	15.8	<10 U	18900	18	2890	733	0.026	17.3	963	0.54 B	<0.1 U	58.9	0.15 J	14	47.6
	7D9	IGDSS-016M-0001-SO	SS	9/14/2011	10600 B	0.75	15.9	75.9	0.62	0.77	5620	36.7	10.4	19.2	<10 U	23400	41.5	3150	633	0.026	24.5	990	<0.41 U	<0.1 U	51.8	0.32	13.6	72.3
	7D9	IGDSD-017M-0001-SD	SD	9/14/2011	10200 B	2.2	14.6	57.6	0.65	0.77	3940	193	13.3	18	<10 U	23100	18.7	2760	576	0.026	24.9	1240	0.2 J	<0.1 U	68.8	0.24 J	14.6	63.5
F	F37	IGFSS-001M-0001-SO	SS	9/13/2011	5380 B	0.88	7.3	46.9	0.34	0.37	1860	52.8	5.6	12.1	3 J	16700	20.2	1210	403	0.026	14.1	767	0.26	<0.1 U	18.2	0.18 J	11.5	50.7
	F37	IGFSD-002M-0001-SD	SD	9/15/2011	6610 B	0.79	5.9	67.4	0.42	0.38	1750	187	5.7	13.4	3.4 J	17100	12.2	1390	340	0.027	16.2	1090	0.39	<0.1 U	62.1	0.17 J	13.1	53.1
J	J67	IGJSS-001M-0001-SO	SS	9/13/2011	6350 B	0.92	10.2	47	0.4	0.31	1750	14.6	10.3	12.7	<11 U	19500	41.3	1570	630	0.028	19.9	754	0.37	<0.1 U	13.3	0.15 J	12.3	58.6
	J67	IGJSD-002M-0001-SD	SD	9/15/2011	7420 B	0.82	8.7	63.1	0.48	0.4	2080	106	9.3	13.4	2.5	18500	12	1500	505	0.034	22.3	1790	0.91	<0.1 U	69.5	0.1 J	13.5	61.5
K	K75	IGKSS-001M-0001-SO	SS	9/13/2011	7400 B	0.85	10.1	45.5	0.36	0.31	1800	17.4	6.4	13.5	<11 U	19000	18.7	1630	335	0.026	14.4	814	0.24	<0.1 U	14	0.16 J	13.4	46.3
	K75	IGKSD-002M-0001-SD	SD	9/15/2011	7210 B	0.77	8.8	62.9	0.45	0.58	2940	83.6	7.3	14.4	<11 U	17600	14.5	1770	404	0.032	17.1	1260	0.35	<0.1 U	38.9	0.14	12.7	59.6
L	L84	IGLSS-001M-0001-SO	SS	9/13/2011	7110 B	0.93	11.6	41.9	0.34	0.33	1240	60.4	6.6	12.8	<9.2 U	18600	17.9	1700	327	0.022	16.8	855	0.25	<0.1 U	21.6	0.15 J	12.3	55.3
	L84	IGLSD-002M-0001-SD	SD	9/15/2011	8430 B	1.3	14.2	59.2	0.44	0.42	3400	234	7.6	17.6	<10 U	23400	18.5	2100	437	0.032	19.3	1320	0.73	<0.1 U	59.5	0.12 J	14.4	73.5
P	P118	IGPSS-001M-0001-SO	SS	9/13/2011	9100 B	1.4	13.8	47	0.4	0.034	1370	126	7.8	14.7	<11 U	25800	15.4	1950	354	0.024	16.6	1040	0.65	<0.1 U	37.9	0.18 J	14.9	51.1
	P118	IGPSD-002M-0001-SD	SD	9/13/2011	5630 B	0.85	9.7	32.8	0.29	0.28	1340	59.1	5.7	12.4	<11 U	16600	9.5	1520	228	0.023	14.5	710	0.39	<0.1 U	25.5	<0.48 U	9.4	42.2
	P122	IGPSS-004M-0001-SO	SS	9/13/2011	10300 B	1.3	11.3	60.7	0.52	0.16	2170	180	8	14.3	3.7 J	24100	17.2	2110	426	0.025	18.9	1420	0.61	<0.1 U	47	0.24 J	13.6	52.5
	P122	IGPSD-005M-0001-SD	SD	9/13/2011	4950 B	0.47	6.6	41.4	0.28	0.35	1200	8.3	5.6	7.9	<9.7 U	12300	8.5	1240	396	0.027	12.1	538	0.23	<0.1 U	9.7 J	0.16 J	8.6	43.7
	P126	IGPSS-007M-0001-SO	SS	9/13/2011	9200 B	1.5	13.5	48	0.43	0.018 J	1560	79.4	7.4	12.9	<9.3 U	24700	13.4	2090	399	0.022	16.8	1050	0.53	<0.1 U	26	0.12 J	14.7	50.3
	P126	IGPSD-008M-0001-SD	SD	9/15/2011	8090 B	0.77	7.8	55.3	0.46	0.42	2230	124	7	14.5	2.8 J	18200	13.6	1880	134	0.032	18	1280	0.54	<0.1 U	56.4	<0.49 U	13.3	59.2
Q	Q131	IGQSS-001M-0001-SO	SS	9/14/2011	8040 B	0.94	12	50.9	0.38	0.46	2170	74.1	9.2	14.5	<10 U	18100	18.7	1940	451	0.026	18.6	779	0.15 J	<0.1 U	31.6	0.17 J	14.3	58.3
	Q131	IGQSD-002M-0001-SD	SD	9/14/2011	6360 B	0.78	10.7	37.9	0.31	0.32	1060	60.3	7.6	14.9	<10 U	15400	19.4	1110	259	0.022	16.5	633	0.35	<0.1 U	24.1	0.13 J	11.6	53.2
	Q133	IGQSS-004M-0001-SO	SS	9/14/2011	11600 B	1	12.8	68.3	0.53	0.61	3860	82.8	10.6	15.5	<10 U	22200	21.2	3070	473	0.029	22.2	1540	0.15 J	<0.1 U	50.1	0.27	17.3	58.8
	Q133	IGQSS-004M-0002-SO	SS	9/14/2011	15100 B	<4.1 U,V	15.1	75.9	0.71	<0.2 U,V	4150	151	10.6	17.2	<10 U	28300	22.2	3110	622	0.028	26.1	1790	0.56 J,V	<0.51 U,V	65.3	<2.5 U,V	23.8	68.6
	Q133	IGQSD-006M-0001-SD	SD	9/14/2011	11700	0.35 J	11.4	97.1	0.66	0.71	9970	18.3 M	13.8 Y	18.1	<11 U,M	23300 M	15.4 M	4770	810 M	0.023 M	25	1180	0.32	<0.1 U,M	50.5	0.38	15.1 M	79.4 M
	Q133	IGQSD-006M-0002-SD	SD	9/14/2011	11900	0.4 J	12.5	94.9	0.64	0.76	10900	22	10.7	18.5	<11 U	23600	15.4	5010	787	0.023	26.6	1190	0.19 J	<0.1 U	52.7	0.45	15.3	76.6
	Q136	IGQSS-010M-0001-SO	SS	9/14/2011	13500 B	<4.1 U,V	15.3	94.7	0.68	0.26	8790	21.5	8.6	16.5	<9.8 U	28600	25.9	3370	528	0.023	34.1	1040	0.86 J,V	<0.51 U,V	29.4	<0.41 U,V	23.4	86.1
7	HA306	IG7SS-001M-0001-SO	SS	9/14/2011	10500	0.85	13.6	78.1	0.55	0.5	2690	64	10.6	25.9	<10 U	23900	42.8	2870	441	0.023	21.6	1470	0.17 J	<0.1 U	50.2 J	0.26 J	15.2	79.7
	HA306	IG7SD-002M-0001-SD	SD	9/14/2011	9160	0.34 J	13.2	67.5	0.47	0.37	2930	17.8	9.7	17.4	<10 U	21600	17.7	2820	339	0.024	20.6	1120	0.54	<0.1 U	30.3	0.16 J	14	68.8
	HB312	IG7SS-004M-0001-SO	SS	9/14/2011	7400	0.34 J	31.2	71.4	0.44	0.75	3480	19.5	8.3	16.6	<10 U	24900	47.3	2340	809	0.036	17.5	911	0.32	<0.1 U	33.3	0.33	13.2	78.3
	HB312	IG7SD-005M-0001-SD	SD	9/14/2011	7150	2.5	13.5	59	0.39	0.39	3460	244	7	16.2	<10 U	19000	16.9	1940	510	0.031	18.3	1180	0.57	<0.1 U	84.9	0.25 J	13.3	74.9

Notes:

B	Analyte detected in the associated Method Bank
J	Estimated Value
M	Matrix spike and/or Matrix Spike Duplicate recovery outside acceptance limits
U	Analyte concentration was below detection limit
V	Raised Quantitaion or Reporting Limit due to limited sample amount or dilution for matrix background interference.
Y	Replicate/Duplicate precision outside acceptance limits
NGT	National Guard Trainee
RSL	Regional Screening Level
BKG	Background

Value exceeds National Guard FWCUG
Value exceeds Resident Adult FWCUG
Value exceeds National Guard & Resident Adult FWCUGs
Value exceeds RSL

Table 4B
Summary of Detected Constituents and Screening of High Priority Igloo Sampling
Inorganics Surface Water
Ravenna Army Ammunition Plant, Ravenna, Ohio

					Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Potassium	Selenium	Silver	Sodium	Vanadium	Zinc
				Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
				National Guard FWCUG (HI=0.1 or 10^{-6})	73445 NGT	6.45 NGT	4.17 NGT	10640 NGT		4.08 NGT	Essential	6465 NGT		7199 NGT	31269 NGT		Essential	1449 NGT	16 NGT	8258 NGT	Essential		900 NGT	Essential	57.2 NGT	58216 NGT
				Resident Adult FWCUG (HI=0.1 or 10^{-6})	63895	17.1	21.2	12131		15.1	Nutrient	28442		2788	20000		Nutrient	2476	18.2	1445	Nutrient		348	Nutrient	211	21002
				Tapwater RSL (HI=0.1 or 10^{-6})					2.5				0.6			15 (EPA Action Level)						10				
Block	**Igloo Number**	**Sample ID**	**Media**	**Collection Date**																						
B	6B4	IGBSW-003-0001-SW	SW	9/13/2011	9960	9.3	11.2 J	141	0.68	0.92 J	96600	11.6	10.6	32.5	22000	26.5	15600	4140	0.11 J	26.9	5470	5.7 J	<4 U	1080	16.4	122
C	6C2	IGCSW-009-0001-SW	SW	9/15/2011	245	<12 U	<24 U	22.9 M	<0.6 U	<2 U	50600	<4 U	<4 U	4.3	377	<4 U	3240	48.2 Y	<0.12 U	<6 U	961	2.3 J	0.92 JB	312 J	<5 U	<10 U
	6C4	IGCSW-013-0001-SW	SW	9/13/2011	2740	2.2 J	<24 U	65.1	<0.6 U	<2 U	103000	2.6	1.4 J	5.4	5550	7.4	8480	380	<0.12 U	3.7	2640	3.2 J	1.1 J	2160	4.8	12.9
F	F37	IGFSW-003-0001-SW	SW	9/15/2011	357	<12 U	<24 U	27.4 B	<0.6 U	<2 U	36700	<4 U	<4 U	5.9	797	2.8 J	6290	241	<0.12 U	1.8 J	1750	3.2 J	<4 U	2020	<5 U	2.7 J
J	J67	IGJSW-003-0001-SW	SW	9/15/2011	442	3.5 J	4.2 J	29.1 B	<0.6 U	<2 U	41600	<4 U	<4 U	4.2	1990	1.7 J	3890	64.6	<0.12 U	1.7 J	3420	3 J	<4 U	1120	<5 U	5.9
K	K75	IGKSW-003-0001-SW	SW	9/15/2011	256	<12 U	4.6 J	36.6 B	<0.6 U	<2 U	18100	<4 U	1.8 J	5.6	4620	1.9 J	2890	1400	<0.12 U	5.3	2990	<13 U	<4 U	592	<5 U	11.4
L	L84	IGLSW-003-0001-SW	SW	9/15/2011	591	<12 U	<24 U	58.6 B	<0.6 U	<2 U	62900	<4 U	<4 U	8	1200	3.7 J	9480	154	<0.12 U	4.3	4150	2.2 J	<4 U	10100	1.5	24.2
P	P126	IGPSW-009-0001-SW	SW	9/15/2011	290	<12 U	7.1 J	30.7 B	<0.6 U	<2 U	52200	<4 U	1.2 J	<7 U	2160	2.2 J	6710	311	<0.12 U	2.5 J	2290	3.2 J	<4 U	1960	<5 U	2.9 J
Q	Q133	IGQSW-008-0001-SW	SW	9/14/2011	761	<12 U	5.4 J	43.9 B	<0.6 U	<2 U	31000 M	<4 U	1.7 J	<7 U	3390 M	2.7 J	5800	2690	<0.12 U	3.6	1440	<13 U	<4 U	973	0.95 J	10.6
	Q133	IGQSW-008-0002-SW	SW	9/14/2011	793	<12 U	5.2 J	47.1 B	<0.6 U	<2 U	32000	0.74 J	1.7 J	<7 U	3780	3.1 J	5340	2760	<0.12 U	4	1520	3.4 *B	1.3 J	997	<5 U	10.1

Notes:

B	Analyte detected in the associated Method Bank
J	Estimated Value
M	Matrix spike and/or Matrix Spike Duplicate recovery outside acceptance limits
U	Analyte concentration was below detection limit
Y	Replicate/Duplicate precision outside acceptance limits
NGT	National Guard Trainee
RSL	Regional Screening Level

Value exceeds National Guard FWCUG
Value exceeds Resident Adult FWCUG
Value exceeds National Guard & Resident Adult FWCUGs
Value exceeds RSL

Table 2
Summary of Detected Constituents and Screening of High Priority Igloo Sampling
PCBs Surface Soil and Sediment
Ravenna Army Ammunition Plant, Ravenna, Ohio

					Aroclor-1254	Aroclor-1262	Aroclor-1268
				Units	mg/kg	mg/kg	mg/kg
				National Guard FWCUG (HI=0.1 or 10^{-6})	3.46 NGT	3.46 NGT*	3.46 NGT*
				Resident Adult FWCUG (HI=0.1 or 10^{-6})	0.203	0.203 *	0.203 *
Block	**Igloo Number**	**Sample ID**	**Media**	**Collection Date**			
C	1C3	IGCSS-016M-0001-SO	SS	9/13/2011	0.130	0.021 U	0.028 U
D	7D3	IGDSS-010M-0001-SO	SS	9/14/2011	0.023 U	0.038 J	0.028 U
7	HA306	IG7SS-001M-0001-SO	SS	9/14/2011	0.026 U	0.021 U	0.200
	HB312	IG7SS-004M-0001-SO	SS	9/14/2011	0.023 U	0.021 U	0.082 J

Notes:

J	Estimated Value
U	Analyte concentration was below detection limit
NGT	National Guard Trainee
*	FWCUG for Arloclor-1254

Table 2
Summary of Detected Constituents and Screening of High Priority Igloo Sampling
PCBs Surface Soil and Sediment
Ravenna Army Ammunition Plant, Ravenna, Ohio

					Aroclor-1254	Aroclor-1262	Aroclor-1268
				Units	mg/kg	mg/kg	mg/kg
				National Guard FWCUG (HI=1 or 10^{-5})	34.6 NGT	34.6 NGT*	34.6 NGT*
				Resident Adult FWCUG (HI=1 or 10^{-5})	2.03	2.03 *	2.03 *
Block	**Igloo Number**	**Sample ID**	**Media**	**Collection Date**			
C	1C3	IGCSS-016M-0001-SO	SS	9/13/2011	0.130	0.021 U	0.028 U
D	7D3	IGDSS-010M-0001-SO	SS	9/14/2011	0.023 U	0.038 J	0.028 U
7	HA306	IG7SS-001M-0001-SO	SS	9/14/2011	0.026 U	0.021 U	0.200
	HB312	IG7SS-004M-0001-SO	SS	9/14/2011	0.023 U	0.021 U	0.082 J

Notes:

J	Estimated Value
U	Analyte concentration was below detection limit
NGT	National Guard Trainee
*	FWCUG for Arloclor-1254

Table 1
Summary of Detected Constituents and Screening of High Priority Igloo Sampling
Pesticides Surface Soil and Sediment
Ravenna Army Ammunition Plant, Ravenna, Ohio

					4,4'-DDD	4,4'-DDE	4,4'-DDT	Dieldrin	Endrin	Heptachlor	Methoxychlor
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				National Guard FWCUG (HI=0.1 or 10^{-6})		49.1 NGT		0.839 NGT	33 NGT	2.98 NGT	
				Resident Adult FWCUG (HI=0.1 or 10^{-6})		4.08		0.0867	1.77	0.308	
				Residential Soil RSL (HI=0.1 or 10^{-6})	2.2 (RSL for DDD)		1.9 (RSL for DDT)				31
Block	**Igloo Number**	**Sample ID**	**Media**	**Collection Date**							
C	1C5	IGCSD-021M-0001-SD	SD	9/13/2011	0.00031 U	0.00031 U	0.00051 U	0.00031 U	0.00041 U	0.00041 U	0.00170 J,P
	1C5	IGCSS-019M-0001-SO	SO	9/13/2011	0.00092 J	0.00031 U	0.00490	0.00031 U	0.00041 U	0.00041 U	0.00320 P
	7C3	IGCSD-033M-0001-SD	SD	9/14/2011	0.00031 U	0.00072 J	0.00100 J,P	0.00031 U	0.00041 U	0.00092 J	0.00072 U
	7C3	IGCSD-033M-0002-SD	SD	9/14/2011	0.00031 U	0.00031 U	0.00250	0.00031 U	0.00041 U	0.00041 U	0.00072 U
	7C3	IGCSS-031M-0001-SO	SO	9/14/2011	0.00031 U	0.00200	0.00420	0.00031 U	0.00041 U	0.00041 U	0.00071 U
	7C3	IGCSS-031M-0002-SO	SO	9/14/2011	0.00030 U	0.00200	0.00460	0.00030 U	0.00040 U	0.00040 U	0.00070 U
Q	Q133	IGQSD-006M-0001-SD	SD	9/14/2011	0.00031 U	0.00031 U,M	0.00200	0.00031 U,M	0.00100 J	0.00042 U	0.00220 J,P
	Q133	IGQSS-004M-0001-SO	SO	9/14/2011	0.00031 U	0.00031 U	0.00082 J,P	0.00031 J,P	0.00041 U	0.00041 U	0.00071 U

Notes:

J	Estimated Value
M	Matrix spike and/or Matrix Spike Duplicate recovery outside acceptance limits
P	Concentration of analyte differs more than 40% between primary and confirmation analysis
U	Analyte concentration was below detection limit
NGT	National Guard Trainee

Table 1
Summary of Detected Constituents and Screening of High Priority Igloo Sampling
Pesticides Surface Soil and Sediment
Ravenna Army Ammunition Plant, Ravenna, Ohio

					4,4'-DDD	4,4'-DDE	4,4'-DDT	Dieldrin	Endrin	Heptachlor	Methoxychlor
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				National Guard FWCUG (HI=1 or 10^{-5})		491 NGT		8.39 NGT	330 NGT	29.8 NGT	
				Resident Adult FWCUG (HI=1 or 10^{-5})		40.8		0.867	17.7	3.08	
				Residential Soil RSL (HI=1 or 10^{-5})	22 (RSL for DDD)		19 (RSL for DDT)				310
Block	**Igloo Number**	**Sample ID**	**Media**	**Collection Date**							
C	1C5	IGCSS-019M-0001-SO	SO	9/13/2011	0.00092 J	0.00031 U	0.00490	0.00031 U	0.00041 U	0.00041 U	0.00320 P
	1C5	IGCSD-021M-0001-SD	SD	9/13/2011	0.00031 U	0.00031 U	0.00051 U	0.00031 U	0.00041 U	0.00041 U	0.00170 J,P
	7C3	IGCSD-033M-0001-SD	SD	9/14/2011	0.00031 U	0.00072 J	0.00100 J,P	0.00031 U	0.00041 U	0.00092 J	0.00072 U
	7C3	IGCSD-033M-0002-SD	SD	9/14/2011	0.00031 U	0.00031 U	0.00250	0.00031 U	0.00041 U	0.00041 U	0.00072 U
	7C3	IGCSS-031M-0001-SO	SO	9/14/2011	0.00031 U	0.00200	0.00420	0.00031 U	0.00041 U	0.00041 U	0.00071 U
	7C3	IGCSS-031M-0002-SO	SO	9/14/2011	0.00030 U	0.00200	0.00460	0.00030 U	0.00040 U	0.00040 U	0.00070 U
Q	Q133	IGQSD-006M-0001-SD	SD	9/14/2011	0.00031 U	0.00031 U,M	0.00200	0.00031 U,M	0.00100 J	0.00042 U	0.00220 J,P
	Q133	IGQSS-004M-0001-SO	SO	9/14/2011	0.00031 U	0.00031 U	0.00082 J,P	0.00031 J,P	0.00041 U	0.00041 U	0.00071 U

Notes:

J	Estimated Value
M	Matrix spike and/or Matrix Spike Duplicate recovery outside acceptance limits
P	Concentration of analyte differs more than 40% between primary and confirmation analysis
U	Analyte concentration was below detection limit
NGT	National Guard Trainee

Table 3A
Summary of Detected Constituents and Screening of High Priority Igloo Sampling
SVOC Surface Water
Ravenna Army Ammunition Plant, Ravenna, Ohio

					Benzyl alcohol	Bis(2-ehylhexyl)phthalate	Diethylphthalate
				Units	ug/L	ug/L	ug/L
				National Guard FWCUG (HI=0.1 or 10^{-6})		6.79 NGT	
				Resident Adult FWCUG (HI=0.1 or 10^{-6})		3.49	
				Tapwater RSL (HI=0.1 or 10^{-6})	200		1500
Block	**Igloo Number**	**Sample ID**	**Media**	**Collection Date**			
L	L84	IGLSW-003-0001-SW	SW	9/15/2011	0.54 U	1.10 J	0.45 U
P	P126	IGPSW-009-0001-SW	SW	9/15/2011	0.63 J	0.80 J	0.96 J
Q	Q133	IGQSW-008-0001-SW	SW	9/14/2011	0.54 U	4.30	0.45 U
	Q133	IGQSW-008-0002-SW	SW	9/14/2011	0.54 U	2.00	0.45 U

Notes:

J	Estimated Value
M	Matrix spike and/or Matrix Spike Duplicate recovery outside acceptance limits
P	Concentration of analyte differs more than 40% between primary and confirmation analysis
U	Analyte concentration was below detection limit
NGT	National Guard Trainee

Table 3A
Summary of Detected Constituents and Screening of High Priority Igloo Sampling
SVOC Surface Water
Ravenna Army Ammunition Plant, Ravenna, Ohio

					Benzyl alcohol	Bis(2-ehylhexyl)phthalate	Diethylphthalate
				Units	ug/L	ug/L	ug/L
				National Guard FWCUG (HI=1 or 10^{-5})		67.9 NGT	
				Resident Farmer Adult FWCUG (HI=1 or 10^{-5})		34.9	
				Tapwater RSL (HI=1 or 10^{-5})	200		1500
Block	**Igloo Number**	**Sample ID**	**Media**	**Collection Date**			
L	L84	IGLSW-003-0001-SW	SW	9/15/2011	0.54 U	1.10 J	0.45 U
P	P126	IGPSW-009-0001-SW	SW	9/15/2011	0.63 J	0.80 J	0.96 J
Q	Q133	IGQSW-008-0001-SW	SW	9/14/2011	0.54 U	4.30	0.45 U
	Q133	IGQSW-008-0002-SW	SW	9/14/2011	0.54 U	2.00	0.45 U

Notes:

J	Estimated Value
M	Matrix spike and/or Matrix Spike Duplicate recovery outside acceptance limits
P	Concentration of analyte differs more than 40% between primary and confirmation analysis
U	Analyte concentration was below detection limit
NGT	National Guard Trainee

Table 5B
Summary of Detected Constituents and Screening of High Priority Igloo Sampling
VOC Surface Water
Ravenna Army Ammunition Plant, Ravenna, Ohio

					Acetone	**Toluene**
				Units	ug/L	ug/L
				National Guard FWCUG (HI=0.1 or 10^{-6})		
				Resident Adult FWCUG (HI=0.1 or 10^{-6})		
				Tapwater RSL (HI=0.1 or 10^{-6})	1400	110
Block	**Igloo Number**	**Sample ID**	**Media**	**Collection Date**		
Q	Q-133	IGQSW-009-0001-SW	SW	9/14/2011	5.00 U	0.55 J
	Q-133	IGQSW-009-0002-SW	SW	9/14/2011	5.20 J	0.65 J

Notes:

U Analyte concentration was below detection limit

J Estimated Value

Table 5B
Summary of Detected Constituents and Screening of High Priority Igloo Sampling
VOC Surface Water
Ravenna Army Ammunition Plant, Ravenna, Ohio

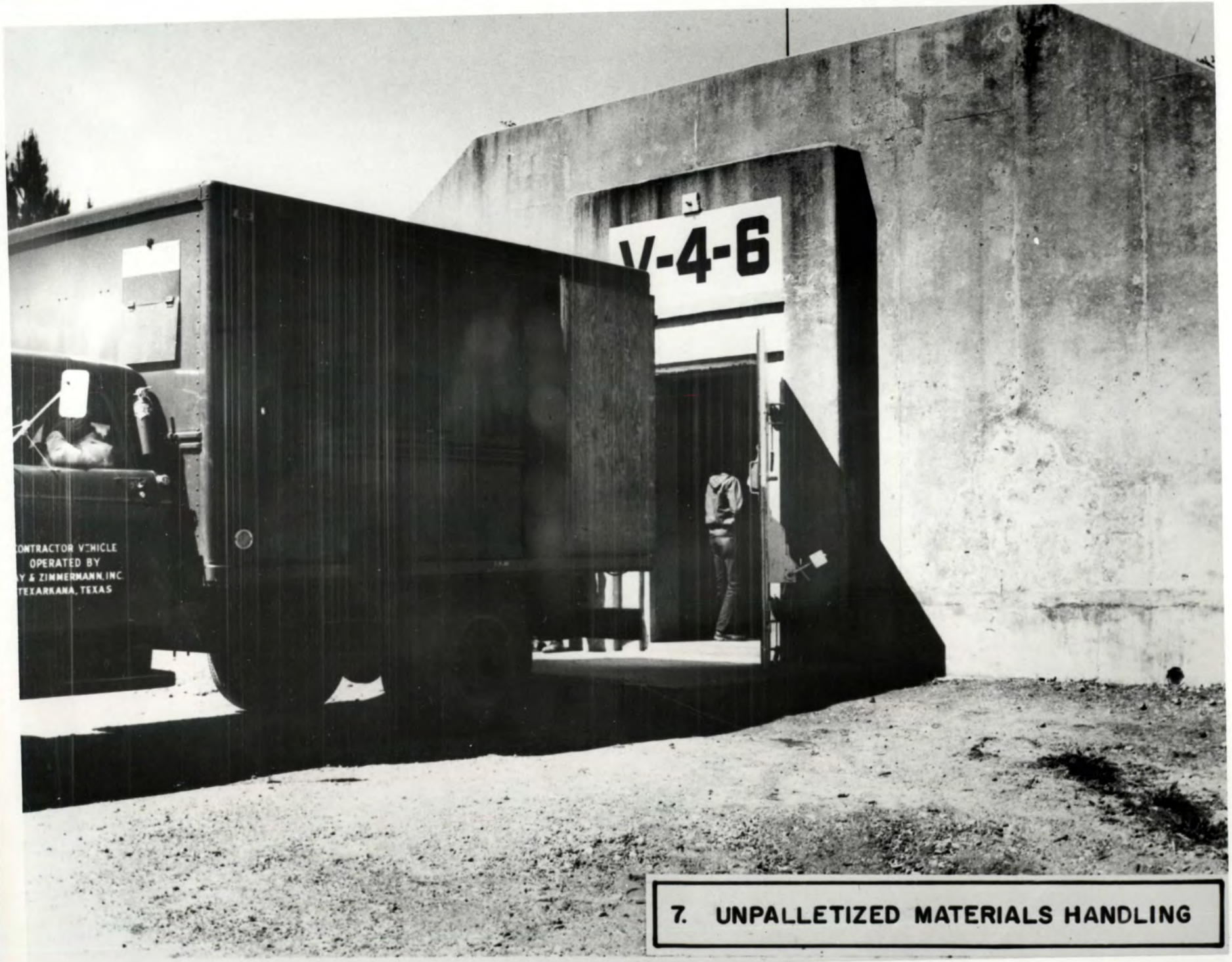
					Acetone	**Toluene**
				Units	ug/L	ug/L
				National Guard FWCUG (HI=1 or 10^{-5})		
				Resident Adult FWCUG (HI=1 or 10^{-5})		
				Tapwater RSL (HI=1 or 10^{-5})	14000	110
Block	**Igloo Number**	**Sample ID**	**Media**	**Collection Date**		
Q	Q-133	IGQSW-009-0001-SW	SW	9/14/2011	5.00 U	0.55 J
	Q-133	IGQSW-009-0002-SW	SW	9/14/2011	5.20 J	0.65 J

Notes:

U	Analyte concentration was below detection limit
J	Estimated Value

SECTION 6:

EXAMPLE AMMUNITION TRANSFER RECORDS AND PHOTOGRAPHS FROM 1970'SSHOWING TRANSFER OF MUNITIONS AND STORAGE OF MUNITIONS IN ECMS



7. UNPALLETIZED MATERIALS HANDLING

5121

RAVENNA ARMY AMMUNITION PLANT

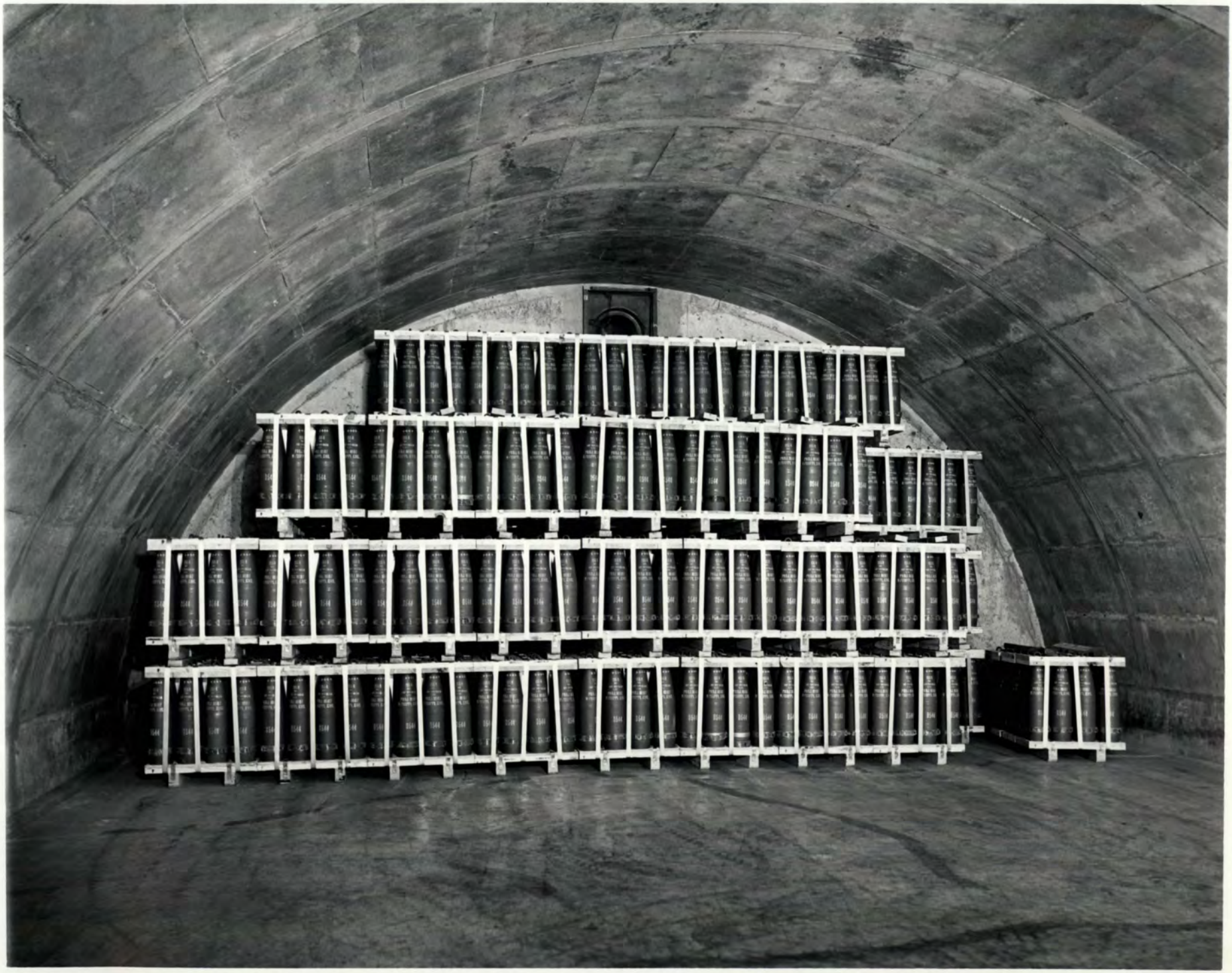
Subj: APSA Copy

Place

Date AUG 19 1969

Neg. No. 5929

IF PUBLISHED CREDIT LINE MUST READ
"OFFICIAL U. S. ARMY PHOTO"



RAVENNA ARMY AMMUNITION PLANT

Subj: 155 m/m Storage in Igloo, "B" Block

Place Depot

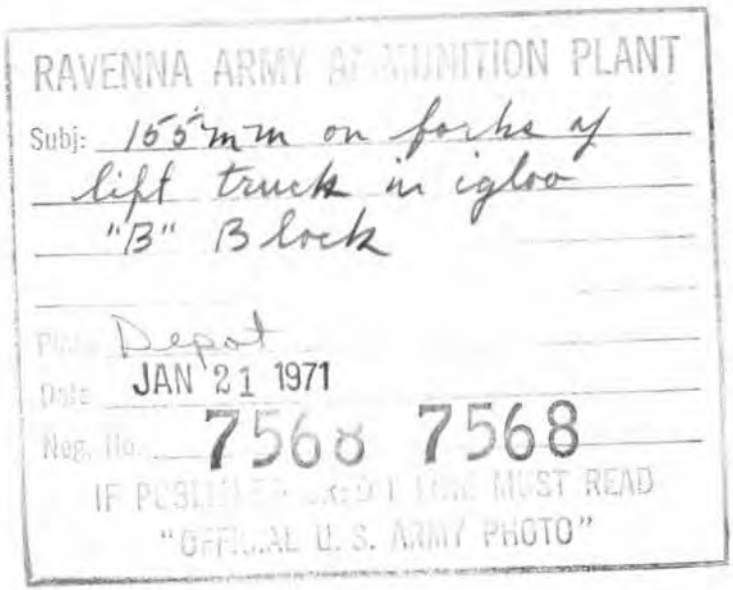
Date JAN 21 1971

Neg. No. 7567

IF PUBLISHED CREDIT LINE MUST READ

"OFFICIAL U. S. ARMY PHOTO"


US. ARMY
USA. 10168N233
CAP. 4.000


RAVENNA ARMY AMMUNITION PLANT
Subj: 155 mm on forks of lift truck in igloo "B" Block
Depot
Date: JAN 21 1971
Neg. No. 7568 7568
IF PUBLISHED CREDIT LINE MUST READ
"OFFICIAL U. S. ARMY PHOTO"


T-33-T

RAVENNA ARMY AMMUNITION PLANT

Subj: 155 mm on pallet in trailer, "B" Block

Place Depot

Date JAN 21 1971

Neg. No. 7569

IF PUBLISHED CREDIT LINE MUST READ
"OFFICIAL U. S. ARMY PHOTO"


APPROVED B.11
NOT APPROVED
FOR USE IN
EXPOSED BULK
POWDER OR
EXPLOSIVED
CLARK
US.ARMY
USA T0463479

RAVENNA ARMY AMMUNITION PLANT

Subj: 155mm from railcar to lift truck, "B" Block

Plant: Depot

Date: JAN 21 1971

Neg. No: 7570

IF PUBLISHED CREDIT LINE MUST READ
"OFFICIAL U. S. ARMY PHOTO"


4
07F34669
CLARK
APPROVED B.I.
NOT APPROVED
FOR USE IN
EXPOSED BULK
POWDER OR
EXPLOSIVED
US ARMY
USA 10463479
CAP. 4.000

J

RAVENNA ARMY AMMUNITION PLANT

Subj: 155 m/m to trailer
"B" Block

Place Depot Area

Date JAN 21 1971

Neg. No. 7571

IF PUBLISHED CREDIT MUST READ
"OFFICIAL U. S. ARMY PHOTO"

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 24 JUN 1998 | CONTROL NUMBER: 98-00$

FROM STOCK NUMBER	NOMENCLATURE
1376-00-764-8065	COMP A5

TO STOCK NUMBER	NOMENCLATURE
1376-00-764-8065	COMP A5

	FROM SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	TO SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
	SERIAL	LOT												SERIAL	LOT											
X	HOL86F640-323		H	6D2							1080	18		HOL86F640-323		H	DEMO GROUNDS							1080	18	
X	HOL86F640-322		H	6D2							2760	46		HOL86F640-322		H	DEMO GROUNDS							2760	46	
X	HOL86H640-335		H	6D2							240	4		HOL86H640-335		H	DEMO GROUNDS							240	4	
?	HOL86F640-321		H	6D2							120	2		HOL86F640-321		H	DEMO GROUNDS							120	2	
X	HOL86F640-581		H	6D2							60	1		HOL86F640-581		H	DEMO GROUNDS							60	1	
X	HOL86J640-347		H	6D2							60	1		HOL86J640-347		H	DEMO GROUNDS							60	1	
	1376-00-628-3329			NITROGUANIDINE										1376-00-628-3329			NITROGUANIDINE									
X	SOW88C019-202		H	6D2							414	9		SOW88C019-202		H	DEMO GROUNDS							414	9	
	1376-00-005-5116			CYCLOTOL										1376-00-005-5116			CYCLOTOL									
X	HOL90B924-033		H	6D2							120	2		HOL90B924-033			DEMO GROUNDS							120	2	
	1376-00-832-0191			TETRYL										1376-00-832-0191												
X	JA 9415		H	6D2							50	1		JA 9415		H	DEMO GROUNDS							50	1	

REMARKS: Items were not shippable and were used as donor material, by EOD, in the demolition of other unsafe munitions.
Demolition was ordered by James Bertelsen AMSIO_AMI., and was done by EOD Ref 731-46-98.
June 2, 1998 through June 5, 1998

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ RECLASSIFICATION
- ☐ SERIAL/LOT NUMBER CHANGE
- ☒ OTHER
- ☐ STOCK NUMBER CHANGE
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR: J Bullock — DATE OF ACTION: 6/29/98

APPROVED/DATE: [signature] — 6/29/98

APPROVED/DATE:

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 24 JUN 98 | CONTROL NUMBER: 98-003

FROM STOCK NUMBER	NOMENCLATURE	TO STOCK NUMBER	NOMENCLATURE
1376-01-055-0997	PROPELLANT, WC 860	1376-01-055-0997	PROPELLANT WC 860

SERIAL/LOT NUMBER (FROM) SERIAL	LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER (TO) SERIAL	LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
OMF90E-049563		H	3D12							80 LB	1		OMF90E-049563		H	DEMO GROUNDS	EOD						80 LBS		
1376-00-689-4063			BLACK	POWDER									1376-00-689-4063			BLACK	POWDER								
G0E-63-9		H	3D12							25 LBS			G0E-63-9		H	DEMO GROUNDS	EOD						25 LBS		
DuP 75-125		H	3D12							25 LBS			DuP 75-125		H	DEMO GROUNDS	EOD						25 LBS		
			CTG 45 CAL BALL													CTG 45 CAL BALL									
TZ286F022-004		H	I-C-13							200			TZ286F022-004		H	DEMO GROUNDS	EOD						200		
1375-00-180-9356			DET CORD										1375-00-180-9356			DET CORD									
EBG92G002-016		A	6C4							7,300 FT	3		EBG92G002-016		H	DEMO GROUNDS	EOD						7,300 FT		

REMARKS: Items were unsafe to ship and were ordered destroyed by James Bertelsen AMSIO-AMI. This was done by EOD, ref 731-46-98. Items were destroyed June 2, 1998 through June5, 1998.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☒ RECLASSIFICATION
- ☒ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR: J Bullock — DATE OF ACTION: 6/29/98

APPROVED/DATE: [signature] — 6/29/98

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 24 JUN 98

CONTROL NUMBER: 98-003

FROM

STOCK NUMBER	NOMENCLATURE
	ELECTRIC SQUIBS

TO

STOCK NUMBER	NOMENCLATURE
	ELECTRIC SQUIBS

SERIAL/LOT NUMBER (FROM)		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER (TO)		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
SERIAL	LOT												SERIAL	LOT											
29Ju90R51 ✓		A	3D12							100	1		29Ju90R51		H	DEMO GROUNDS	EOD						100		
05MAQIRS ✓		A	3D12							554			05MAQIRS		H	DEMO GROUNDS	EOD						554		
91R5 ✓		A	3D12							8	1		91R5		H	DEMO GROUNDS	EOD						8		
060C92B5		A	3D12							400	1		060C92B5		H	DEMO GROUNDS	EOD						400		
UNKNOWN		H	3D12							100	1		UNKNOWN		H	DEMO GROUNDS	EOD						100		
NQ07827-1-17		A	6C5							550	1		NQ07827-1-17		H	DEMO GROUNDS	EOD						550		
			BLASTING CAPS													BLASTING CAPS									
IRI90L005-013		A	6C5							360	2		IRI90L005-013		H	DEMO GROUNDS	EOD						360		
IRI91E006-016		A	6C5							318	2		IRI91E006-016		H	DEMO GROUNDS	EOD						318		

REMARKS

Items were unsafe to ship and were ordered destroyed by James Bertelsen AMSIO-AMI. This was done by EOD, ref 731-46-98. Items were destroyed June 2, 1998 through June 5, 1998.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☒ RECLASSIFICATION
- ☒ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR: J Bullock — DATE OF ACTION: 6/29/98

APPROVED/DATE: [signature] — 6/29/98

APPROVED/DATE:

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 24 JUN 98

CONTROL NUMBER: 98-003

FROM — STOCK NUMBER: UNKNOWN — NOMENCLATURE:

TO — STOCK NUMBER: UNK — NOMENCLATURE:

	FROM SERIAL/LOT NUMBER SERIAL	FROM SERIAL/LOT NUMBER LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	TO SERIAL/LOT NUMBER SERIAL	TO SERIAL/LOT NUMBER LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
/	UNK 80MM MORTAR		H	F15							1	1		UNK 80 MM MORTAR		H	DEMO GROUNDS	EOD						1		
X	UNK 81mm MORTAR & FUZE		H	F15							1	1		11 81 MM MORTAR		H	↑	↑						1		
X	UNK PRIMERS		H	F15							100	1		11 PRIMERS		H								100		
X	UNK 40MM CARTRIDGE		H	F15							311	1		11 40 MM CARTRIDGE		H								311		
	UNK CAN TNT STUFF		H	F15							1	1		11 CAN TNT STUFF		H								1		
X	UNK M1 PROPELLANT		H	1C13							2LB 6OZ	1		11 M1 PROPELLANT		H								2LB 6OZ		
X	UNK PROPELLANT WC846		H	1C13							2LBS	1		11 PROPELLANT WC846		H								2LB		
X	UNK COMP B SCRAP		H	6C4							69	2		11 COMP B SCRAP		H								69		
X	UNK 3"/50 ADF MK64 3 17		H	2D7							11351	61		11 3"/50 ADF MK 54		H								11351		
X	UNK FUZES		H	3D12							26			11 FUZES		H								26		
X	UNK 152MM PROJECTILES		H	3D12							34			11 152 MM PROJECTILES		H								34		
X	UNK 155 COPPERHEAD FIN		H	3D12							21	3		11 155 COPPERHEAD FIN		H								21		
X	UNK RELOAD KIT 100 M1		H	3D12							11			11 RELOAD KIT 100 M1		H								11		
X	UNK 105 MM PROJECTILE		H	3D12							1	1		11 105 MM PROJECTILE		H								1		
X	UNK M571 FUZES		H	3D12							44			11 M571 FUZES		H								44		
X	UNK FOR M571 FUZE DETONATING ASSEM		H	3D12							9			11 FOR M571 FUZE DETONATING ASSEM		H	DEMO GROUNDS	EOD						9		

REMARKS

Items were unsafe to ship and were ordered destroyed by James Bertelsen AMSIO-AMI. This was done by EOD, ref 731-46-98. Items were destroyed June 2, 1998 through June 5, 1998.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ RECLASSIFICATION
- ☐ SERIAL/LOT NUMBER CHANGE
- ☒ OTHER
- ☐ STOCK NUMBER CHANGE
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR: J Bullock — DATE OF ACTION: 6/29/98

APPROVED/DATE: [signature] — 6/29/98

APPROVED/DATE:

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 24 JUN 98

CONTROL NUMBER: 98-003

FROM STOCK NUMBER	NOMENCLATURE	TO STOCK NUMBER	NOMENCLATURE

FROM SERIAL/LOT NUMBER: SERIAL	FROM SERIAL/LOT NUMBER: LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	TO SERIAL/LOT NUMBER: SERIAL	TO SERIAL/LOT NUMBER: LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
UNK	CARTRIDGE 90MM	H	3D12							2	1		UNK	CARTRIDGE 90MM	H	DEMO GROUNDS	EOD								
UNK	105G APERS-TM494	H	3D12							39			11	105G APERS-TM494	H										
UNK	WITH MX FUZE 105G APERS-TM494	H	3D12							28			11	WITH MX FUZE 105G APERS-TM494	H										
UNK	MK 22 FUZES	H	3D12							27			11	MK 22 FUZES	H										
UNK	SUBMUNITION M Cheese Wedge	H	F15							1	1		11	SUBMUNITION M CHEESEWEDGE	H										
UNK	90MM FUZE	H	F15							1	1		11	90MM FUZE	H										
UNK	BOOSTER	H	F15							1	1		11	BOOSTER	H										
UNK	M205C3G Case	H	F15							1	1		11	M205C3G Case	H										
UNK	SMALL BAGS POWDER	H	F15							6	6		11	SMALL BAGS POWDER	H										
UNK	STICK TNT	H	F15							1	1		11	STICK TNT	H										
UNK	CONCRETE TPT M764 W/TRACER	H	F15							4	4		11	CONCRETE TPT M764 W/TRACER	H	DEMO GROUNDS	EOD								

REMARKS

Items were unsafe to ship and were ordered destroyed by James Bertelsen AMSIO-AMI. This was done by EOD, ref 731-46-98. Items were destroyed June 2, 1998 through June 5, 1998.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ RECLASSIFICATION
- ☐ SERIAL/LOT NUMBER CHANGE
- ☒ OTHER
- ☐ STOCK NUMBER CHANGE
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR: J Bullock — DATE OF ACTION: 6/29/98

APPROVED/DATE: [signature] — 6/29/98

APPROVED/DATE: [signature]

DA FORM 1 MAY 76 4508

97-002 ~~98-002~~

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 12 November 1997

CONTROL NUMBER: Ravenna AAp

FROM

STOCK NUMBER	NOMENCLATURE
M376-00-689-4063	Black Powder Class 1

TO

STOCK NUMBER	NOMENCLATURE
1376-00-689-4063	Black Powder

FROM SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	TO SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
SERIAL	LOT												SERIAL	LOT											
DUP 75 125	A	A	3D10							25 lbs	1		DUP 75 125	H	H	3D12							25 Lbs	1	
GOE 63-9	H	H	3D13							25 lbs	1		GOE 63-9	H	H	3D12							25 lbs	1	
1376-01-055-0997			PROPELLANT WC 860										1376-01-055-0997			PROPELLANT WC 860								
OMF90E-049563	H	H	3D13							80 lbs	1		OMF90E-049563	H	H	3D12							80 lbd	1	

REMARKS

During out loading one can of black powder was found with a hole rusted through the bottom of the can. The inner lining remains intact. @5 Lbs of DUP 75-125 placed in CCH due to the condition of the container.

Propellant and GOE 63-9 were transferred to another magazine.

TYPE OF ACTION

- [X] LOCATION CHANGE
- [ ] SERIAL/LOT NUMBER CHANGE
- [ ] STOCK NUMBER CHANGE
- [X] RECLASSIFICATION
- [ ] OTHER
- [ ] ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR: J Bullock

DATE OF ACTION: 11/12/97

APPROVED/DATE: 11/12/97

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 1-8-97

CONTROL NUMBER: PD 97-001

FROM	STOCK NUMBER	NOMENCLATURE
	1376-00-764-8065	COMP A5

TO	STOCK NUMBER	NOMENCLATURE
	1376-00-764-8065	Comp A5

SERIAL/LOT NUMBER (FROM)		COND	SITE LOCATION	GRID LOCATION	RESIDUE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER (TO)		COND	SITE LOCATION	GRID LOCATION	RESIDUE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
SERIAL	LOT												SERIAL	LOT											
HOL 89F640-581		A	Q-132							60#	1		HOL 89F640-581		H	6D2							60	1	

REMARKS

During outloading 1 box was found that had a hole chewed through the top. The contents was contaminated with cardboard paper, and mice dropping. This box was placed in CC H.

TYPE OF ACTION

- [X] LOCATION CHANGE
- [ ] SERIAL/LOT NUMBER CHANGE
- [ ] STOCK NUMBER CHANGE
- [X] RECLASSIFICATION
- [ ] OTHER
- [ ] ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR: J Bullock

DATE OF ACTION: 1-8-97

APPROVED/DATE: 1-9-97

APPROVED/DATE:

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 3-5-93

CONTROL NUMBER: PD-10-93

FROM	STOCK NUMBER	NOMENCLATURE
	1376-00-628-3306	Composition B

TO	STOCK NUMBER	NOMENCLATURE
	1376-00-628-3306	Composition B

SERIAL/LOT NUMBER (FROM)		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	LC	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER (TO)		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	LC	METH	MGR	QUANTITY
SERIAL	LOT												SERIAL	LOT									
HOL85M130-499		A	4-A-2							13 boxes			HOL85M130-499		E	4-A-2							13 boxes

REMARKS

13 boxes of Comp B to CC-E, 5 boxes found with torn/tattered labels, 6 boxes found with faded labels and 2 boxes found with loose front/rear flaps. RA-444 (93-023) was sent to ST&O for corrections.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☑ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

D. Hardman 3-5-93

APPROVED/DATE

[signature] 3-5-93

APPROVED/DATE

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 14 Dec.1993

CONTROL NUMBER: 24-93

FROM

STOCK NUMBER	NOMENCLATURE
1376-00-628-3329	Nitroguanidine

TO

STOCK NUMBER	NOMENCLATURE
1376-00-628-3329	Nitroguanidine

SERIAL/LOT NUMBER (FROM)		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER (TO)		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
SERIAL	LOT												SERIAL	LOT											
SOW 91E021-544		A	6-D-7							50 lbs	1		SOW91E021--544		E	6-D-7							50 lbs	/	

REMARKS

Drum No#422 has a hole in the top and needs to be repacked with a new top.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☒ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR: J Bullock

DATE OF ACTION: 12/14/93

APPROVED/DATE

APPROVED/DATE

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: SEPT 3 1993

CONTROL NUMBER: 23-93

FROM

STOCK NUMBER	NOMENCLATURE
1375-00-628-3306	Comp B

SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
SERIAL	LOT											
HOL86A130-526		E	4A6							120 LBS	2	
HOL-050-5062		E	4E2							120 LBS	2	

TO

STOCK NUMBER	NOMENCLATURE
1375-00-628-3306	Comp B

SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
SERIAL	LOT											
HOL86A130-526		A	4A3							120 LBS	2	
HOL 050-5062		A	4E2							120 LBS	2	

REMARKS
HOL86A130-526 BOXES WERE REPACKED (R4444 1-11-91) AND NOW MEET CCA REQUIREMENTS
HOL-050-5062 BOXES were RELABELED 7-13-92 (R4444-92-008) AND NOW MEET ECA REQUIREMENTS

TYPE OF ACTION

- [X] LOCATION CHANGE
- [ ] SERIAL/LOT NUMBER CHANGE
- [ ] STOCK NUMBER CHANGE
- [X] RECLASSIFICATION
- [ ] OTHER
- [ ] ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR: J Bullock 9/3/93

APPROVED/DATE: 9/3/93

APPROVED/DATE: 9/8/93

DATE OF ACTION: 9/3/93

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 16 AUG 1993

CONTROL NUMBER: 22-93

FROM

STOCK NUMBER: 1376-00-628-3306 (VI-10650)

NOMENCLATURE: COMPOSITION B GRADE A

SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
SERIAL	LOT											
HOL 053	5397	E	Q137							2040 LBS	34	

TO

STOCK NUMBER: 1376-00-628-3306 (VI 10650)

NOMENCLATURE: COMPOSITION B GRADE A

SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
SERIAL	LOT											
HOL 053	5397	A	Q137							2040	34	

REMARKS: BOXES WERE REWAREHOUSED AND HAVE DRYED. MARKING AND LABELS ARE GOOD. PACKS WILL WITHSTAND SHIPMENT, TO CCA

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☒ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR: J Bullock

DATE OF ACTION: 16 AUG 1993

APPROVED/DATE: [signature] 08/17/93

APPROVED/DATE:

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 7/26/93

CONTROL NUMBER: 21-93

FROM — STOCK NUMBER: 1376-00-628-3306 (VI-10650)

NOMENCLATURE: COMPOSITION B- GRADE A

TO — STOCK NUMBER: 1376-00-628-3306

NOMENCLATURE: COMPOSITION B GRADE A

SERIAL/LOT NUMBER: SERIAL	SERIAL/LOT NUMBER: LOT	COND	SITE LOCATION	GRID LOCATION	RESSITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER: SERIAL	SERIAL/LOT NUMBER: LOT	COND	SITE LOCATION	GRID LOCATION	RESSITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
HOL-053-211		A	2-C-9							60 LB	1		HOL 053-211		E	2-C-9							60 LBS	1	

REMARKS

BOTTOM OF BOX WAS TORN THROUGH LINER, AND WAS TAPED. NEW BOTTOM AND LINER NEEDED. REPACK

TYPE OF ACTION

- [ ] LOCATION CHANGE
- [ ] SERIAL/LOT NUMBER CHANGE
- [ ] STOCK NUMBER CHANGE
- [x] RECLASSIFICATION
- [ ] OTHER
- [ ] ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR: J Bullock

DATE OF ACTION: 7-26-93

APPROVED/DATE: William M. Wheaton 7-26-93

APPROVED/DATE

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 6-9-93

CONTROL NUMBER: PD 20-93

FROM

STOCK NUMBER	NOMENCLATURE
1376-00-689-4063	BLACK POWDER CLASS 1

TO

STOCK NUMBER	NOMENCLATURE
1376-00-689-4063	BLACK POWDER CLASS 1

FROM SERIAL/LOT NUMBER: SERIAL	FROM SERIAL/LOT NUMBER: LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	TO SERIAL/LOT NUMBER: SERIAL	TO SERIAL/LOT NUMBER: LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
GOE 75-7		A	3D11							25 Lbs	1		GOE 75-7		H	3D12							25Lbs	1	

REMARKS

CAN IS RUSTED THROUGH EXPOSING THE LINER
DEMIL RECOMMENDED.

TYPE OF ACTION

- [X] LOCATION CHANGE
- [ ] SERIAL/LOT NUMBER CHANGE
- [ ] STOCK NUMBER CHANGE
- [X] RECLASSIFICATION
- [ ] OTHER
- [ ] ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR: J Bullock

DATE OF ACTION: 6-9-93

APPROVED/DATE: William M. Walker 6-10-93

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 5-25-93

CONTROL NUMBER: PD19-93

FROM — STOCK NUMBER: 1376-00-689-4063 — NOMENCLATURE: BLACK POWDER, CLASS 1

TO — STOCK NUMBER: 1376-00-689-4063 — NOMENCLATURE: BLACK POWDER, CLASS 1

SERIAL/LOT NUMBER (SERIAL / LOT)	COND	SITE LOCATION	GRID LOCATION	RESSITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER (SERIAL / LOT)	COND	SITE LOCATION	GRID LOCATION	RESSITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
DUP 75-125	A	3D10							25 Lbs	1		DUP 75-125	H	3D12							25 LBS NEW	1	
DUP 75-123	A	3D10							25 Lbs	1		DUP 75-123	H	3D12							25 Lbs NEW	1	

REMARKS

CANS WERE RECEIVED WITH HOLES RUSTED THROUGH CANS EXPOSING LINERS. DEMIL RECOMMENDED

TYPE OF ACTION

- [X] LOCATION CHANGE
- [ ] SERIAL/LOT NUMBER CHANGE
- [ ] STOCK NUMBER CHANGE
- [X] RECLASSIFICATION
- [ ] OTHER
- [ ] ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR: J Bullock

DATE OF ACTION: 5-25-93

APPROVED/DATE: [signature] 5-25-93

APPROVED/DATE: Sandra Hengeli 5/25/93

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 3-10-93

CONTROL NUMBER: PD18-93

FROM	STOCK NUMBER	NOMENCLATURE	TO	STOCK NUMBER	NOMENCLATURE
	1376-01-066-4158	PBX 0280 Type III		1376-01-066-4158	PBX 0280 Type III

SERIAL/LOT NUMBER (FROM)		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER (TO)		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY
SERIAL	LOT												SERIAL	LOT									
HOL89L767-125		A	2-D-11							2 boxes			HOL89L767-125		E	2-D-11							2 boxes

REMARKS

2 boxes of PBX to CC-E, found 2 boxes with loose rear flaps. RA-444(93-034) sent to ST&O for correction.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☑ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR: D. Hardman 3-24-93

APPROVED/DATE: [signature] 3-25-93

APPROVED/DATE:

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 3-22-93

CONTROL NUMBER: PD17-93

FROM

STOCK NUMBER	NOMENCLATURE
1376-01-066-4158	PBX 0280 Type III

TO

STOCK NUMBER	NOMENCLATURE
1376-01-066-4158	PBX 0280 TypeIII

FROM SERIAL/LOT NUMBER: SERIAL	FROM SERIAL/LOT NUMBER: LOT	FROM COND	FROM SITE LOCATION	FROM GRID LOCATION	FROM RES SITE	FROM T/S	FROM L/C	FROM METH	FROM MGR	FROM QUANTITY	FROM NO. PKG	FROM UP QTY	TO SERIAL/LOT NUMBER: SERIAL	TO SERIAL/LOT NUMBER: LOT	TO COND	TO SITE LOCATION	TO GRID LOCATION	TO RES SITE	TO T/S	TO L/C	TO METH	TO MGR	TO QUANTITY
HOL89L767-111		A	2-D-10							2 boxes			HOL89L767-111		E	2-D-10							2 boxes
HOL89L767-116		A	2-D-10							1 box			HOL89L767-116		E	2-D-10							1 box

REMARKS

3 boxes of PBX to CC-E, found with loose rear flaps.
RA-444 93-033 sent to ST&O for correction.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☑ RECLASSIFICATION
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ OTHER
- ☐ STOCK NUMBER CHANGE
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

D. Hardman 3-24-93

APPROVED/DATE

[signature] 3-25-93

APPROVED/DATE

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 3-10-93

CONTROL NUMBER: PD-16-93

FROM STOCK NUMBER	NOMENCLATURE	TO STOCK NUMBER	NOMENCLATURE
1376-00-628-3306	Composition B	1376-00-628-3306	Composition B

SERIAL/LOT NUMBER (SERIAL / LOT)	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER (SERIAL / LOT)	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY
HOL053-66	A	N-100							1 box			HOL053-66	E	N-100							1 box

REMARKS

1 box Comp B to CC-E, found that a box top & label need replaced. RA-444(93-31) was forwarded to ST&O.

TYPE OF ACTION

- [ ] LOCATION CHANGE
- [ ] SERIAL/LOT NUMBER CHANGE
- [ ] STOCK NUMBER CHANGE
- [x] RECLASSIFICATION
- [ ] OTHER
- [ ] ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR: [signature] 3-15-93

APPROVED/DATE: [signature] 3-19-93

APPROVED/DATE

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 3-10-93

CONTROL NUMBER: PD-15-93

FROM STOCK NUMBER	NOMENCLATURE	TO STOCK NUMBER	NOMENCLATURE
1376-00-628-3306	Composition B	1376-00-628-3306	Composition B

SERIAL/LOT NUMBER (SERIAL / LOT)	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER (SERIAL / LOT)	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY
HOL053-64	A	M-94							1 box			HOL053-64	E	M-94							1 box

REMARKS

1 box of Comp B to CC-E, found that a box top and label need replaced on a red tagged box. RA-444(93-30) was forwarded to ST&O.

TYPE OF ACTION

- [ ] LOCATION CHANGE
- [ ] SERIAL/LOT NUMBER CHANGE
- [ ] STOCK NUMBER CHANGE
- [x] RECLASSIFICATION
- [ ] OTHER
- [ ] ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR: D. Hardman 3-15-93

APPROVED/DATE: [signature] 3-19-93

APPROVED/DATE

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 3-8-93

CONTROL NUMBER: PD-14-93

STOCK NUMBER	NOMENCLATURE	TO	STOCK NUMBER	NOMENCLATURE
1376-00-764-8065	Comp A-5		1376-00-764-8065	Comp A-5

SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	LC	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	LC	METH	MGR	QUANTITY	NO. PKG
SERIAL	LOT												SERIAL	LOT										
H0L89F640-581		A	Q-132							2 boxes			H0L89F640-581		E	Q-132							2 boxes	

REMARKS

- 2 boxes of Comp. A-5 to CC-E, found with torn/tattered labels. RA-444(93-029) sent to ST&O for completion.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☑ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR: D. Hardman 3-9-93

APPROVED/DATE: [illegible] 3-11-93

APPROVED/DATE:

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 3-5-93

CONTROL NUMBER: PD-13-93

STOCK NUMBER	NOMENCLATURE
1376-00-628-3306	Composition B

SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
SERIAL	LOT											
H0L86A130-520		A	4-A-5							1 box		

TO

STOCK NUMBER	NOMENCLATURE
1376-00-628-3306	Composition B

SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO PK
SERIAL	LOT										
H0L86A130-520		E								1 box	

REMARKS

1 box of Comp B to CC-E, found with hole in box top & liner. RA-444(93-026) sent to ST&O.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☒ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR: D. Hardman 3-8-93

APPROVED/DATE: William G. Weston 3-11-93

APPROVED/DATE:

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 3-5-93

CONTROL NUMBER: PD-12-93

STOCK NUMBER	NOMENCLATURE
1376-00-628-3306	Composition B

TO	STOCK NUMBER	NOMENCLATURE
	1376-00-628-3306	Composition B

SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	LC	METH	MGR	QUANTITY	NO. PKG	UP QTY
SERIAL	LOT											
HOL85M130-515		A	4-A-5							1 box		

SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	LC	METH	MGR	QUANTITY	NO. PKG
SERIAL	LOT										
HOL85M130-515		E								1 box	

REMARKS

- 1 box of Comp B to CC-E, found with hole in box top. RA-444(93-025) sent to ST&O for replacement of box top.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☑ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR: D Hardman 3-8-93

APPROVED/DATE: [illegible] 3-11-93

APPROVED/DATE:

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 3-5-93

CONTROL NUMBER: PD-11-93

FROM

STOCK NUMBER	NOMENCLATURE
1376-00-628-3306	Composition B

TO

STOCK NUMBER	NOMENCLATURE
1376-00-628-3306	Composition B

SERIAL/LOT NUMBER (SERIAL)	SERIAL/LOT NUMBER (LOT)	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
H0L85M130-500		A	4-A-2							5 boxes		

SERIAL/LOT NUMBER (SERIAL)	SERIAL/LOT NUMBER (LOT)	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY
H0L85M130-500		E								5 boxes

REMARKS

5 boxes of Comp B to CC-E, found with torn/tattered labels
Sent RA-444 (93-023) to ST&O.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☑ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

D. Hardman 3-5-93

APPROVED/DATE

William R. Tolbert 3-8-93

APPROVED/DATE

DA FORM 4509

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 3-5-93

CONTROL NUMBER: Pd-9-93

FROM STOCK NUMBER	NOMENCLATURE	TO STOCK NUMBER	NOMENCLATURE
1376-00-628-3306	Composition B	1376-00-628-3306	Composition B

SERIAL/LOT NUMBER (SERIAL / LOT)	COND	SITE LOCATION	GRID LOCATION	RESSITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER (SERIAL / LOT)	COND	SITE LOCATION	GRID LOCATION	RESSITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG
HOL85M130-511	A	4-A-3							3 boxes			HOL85M130-511	E								3 boxes	

REMARKS

3 boxes of Comp B to CC-E found with faded markings and labels. RA-444(93-024) sent to ST&O for label replacement.

TYPE OF ACTION

- [ ] LOCATION CHANGE
- [ ] SERIAL/LOT NUMBER CHANGE
- [ ] STOCK NUMBER CHANGE
- [x] RECLASSIFICATION
- [ ] OTHER
- [ ] ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR: D. Hardman 3-5-93

APPROVED/DATE: [signature] 3-8-93

APPROVED/DATE

DATE

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 3-5-93

CONTROL NUMBER: PD-8-93

FROM

STOCK NUMBER: 1376-00-628-3306

NOMENCLATURE: Composition B

TO

STOCK NUMBER:

NOMENCLATURE:

FROM SERIAL	FROM LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	TO SERIAL	TO LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY
HOL85L130-494		A	4-A-1							1 box			HOL85L130-494		E								1 box

REMARKS

1 box of Comp B to CC-E, found with torn side and loose front flap. RA-444 93-022 has been forwarded to ST&O.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☑ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR: D. Hardman 3-5-93

APPROVED/DATE: [signature] 3-8-93

APPROVED/DATE:

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 3-1-93

CONTROL NUMBER: PD-7-93

FROM	STOCK NUMBER	NOMENCLATURE
	1376-00-764-8065	Composition A-5

TO	STOCK NUMBER	NOMENCLATURE
	1376-00-764-8065	Composition A-5

SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
SERIAL	LOT											
UNKNOWN		A	N104							1 box		

SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	N P
SERIAL	LOT										
UNKNOWN		H	N104							1 box	

REMARKS

1 box of Comp A-5 to CC-H, found with no lot number and an unidentifiable batch number. Reccommend transfer to demil storage location and use as donor/demil material. RA-444 93-021 has been forwarded.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☑ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR: D. Hardman 3-3-93

APPROVED/DATE: [signature] 3-5-93

APPROVED/DATE:

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 2-23-93

CONTROL NUMBER: PD-6-93

STOCK NUMBER	NOMENCLATURE	TO STOCK NUMBER	NOMENCLATURE
1376-00-628-3306	Composition B	1376-00-628-3306	Composition B

SERIAL/LOT NUMBER (SERIAL / LOT)	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER (SERIAL / LOT)	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG
HOL053-135	A	3-E-2							1 box			HOL053-135	H	3-E-2							1 box	

REMARKS

-One damaged box of Comp. B found during outloading. Liner torn and extraneous material found inside of box. Demil/use as a donor material is recommended. Box to be moved to holding area for demil items. CC-A to CC-H.

TYPE OF ACTION

- [ ] LOCATION CHANGE
- [ ] SERIAL/LOT NUMBER CHANGE
- [ ] STOCK NUMBER CHANGE
- [x] RECLASSIFICATION
- [ ] OTHER
- [ ] ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR: [signature] 2-23-93

APPROVED/DATE: [signature]

APPROVED/DATE

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: February 18, 1993

CONTROL NUMBER: PD 5-93

FROM

STOCK NUMBER	NOMENCLATURE
1376-00-005-5116	Cyclotol, 70/30

TO

STOCK NUMBER	NOMENCLATURE

SERIAL/LOT NUMBER (FROM)		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	LC	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER (TO)		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	LC	METH	MGR	QUANTITY	NO. PKG
SERIAL	LOT												SERIAL	LOT										
HOL89M924-024		A	B-2							2 boxes			same		E	B-2							2 boxes	

REMARKS

Two (2) boxes to CC-E, loose front flaps. RA-444 (93-016) has been forwarded.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☑ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

DATE

APPROVED/DATE: J. Bullock J. Bullock 2-18-93

APPROVED/DATE: [signature] 2-18-93

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 1-14-93

FROM	STOCK NUMBER	NOMENCLATURE	TO	STOCK NUMBER	NOMENCLATURE
	1376-00-832-0191	TETRYL		1376-00-832-0191	TETRYL

SERIAL/LOT NUMBER: SERIAL	SERIAL/LOT NUMBER: LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER: SERIAL	SERIAL/LOT NUMBER: LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR
	JA 9 415	E	3C9							45 LBS	1			JA 9415	A	3C9						
	JA 9-415	E	3C9							300 LBS	5			JA 9415	A	3C9						
	~~JA 9 415~~																					
	~~JA 9 415~~																					

REMARKS
THE LIGHT BOXES WERE COMBINED AND REPACKED. The DAMAGED BOX WAS CONTAMINATED WITH BITS OF PAPER AND CARDBOARD

TYPE OF ACTION
- [ ] LOCATION CHANGE
- [ ] SERIAL/LOT NUMBER CHANGE
- [ ] STOCK NUMBER CHANGE
- [x] RECLASSIFICATION
- [ ] OTHER
- [ ] ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR
[signature]
APPROVED/DATE
[signature] 2-1
APPROVED/DATE

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 1.19.93

CONTROL NUMBER: PD 3-93

FROM

STOCK NUMBER: 1376-01-055-0997

NOMENCLATURE: PROPELLANT EXPLOSIVES (SOLID) CLASS B

TO

STOCK NUMBER:

NOMENCLATURE:

FROM SERIAL/LOT NUMBER: SERIAL	FROM SERIAL/LOT NUMBER: LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	TO SERIAL/LOT NUMBER: SERIAL	TO SERIAL/LOT NUMBER: LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH.	MGR	QUANTITY	NO. PKG
WC 860	LOT 190	A	SM1	1						100# NEW.	1		WC 860	LOT 190	H	SM1	1						100# N.E.W.	1
OMF 90E-049563													OMF 90E-049563											
										CHANGE FROM CC A TO CC H														
										SEE REMARKS.														

REMARKS

EXCESS LOADING AUTHORIZATION (2YRS)
LAST DRUM OF PROPELLANT LEFT IN LOT.
ALL OTHERS SHIPPED. RECOMMEND DEMIL -
USE FOR BURNING GROUND OPERATIONS AS REQUIRED

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☑ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR: Gary L. Wohlgemuth

DATE OF ACT: 1.19.9

APPROVED/DATE: William W. Heath 1-21-93

APPROVED/DATE:

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: January 19, 1993

CONTROL NUMBER: PD2-93

STOCK NUMBER	NOMENCLATURE
1376-00-628-3306	Comp B

TO

STOCK NUMBER	NOMENCLATURE
Same	Same

SERIAL/LOT NUMBER (SERIAL)	SERIAL/LOT NUMBER (LOT)	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER (SERIAL)	SERIAL/LOT NUMBER (LOT)	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY
10L 050-5019		E	3E7							1 box			Same		E	Same							Same
10L 050-5042		E	3E9							1 box			Same		E	Same							Same

1/21/93

REMARKS

1 box 1 box

- Lot's HOL-050-5019/& HOL-050-5042/to CC-E, holes in tops to be replaced with new tops & liners.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☒ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

1-20-93

APPROVED/DATE

1-21-93

APPROVED/DATE

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: January 18, 1993

CONTROL NUMBER: PD 1-93

FROM	STOCK NUMBER	NOMENCLATURE
	1376-00-628-3303	Comp B

TO	STOCK NUMBER	NOMENCLATURE
	Same	Same

SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG
SERIAL	LOT												SERIAL	LOT										
HOL-053-165		A	3-B-3							1 box			Same		E	Same							Same	

REMARKS: One (1) box to CC-E, damaged box top - to be replaced.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☑ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

DATE

APPROVED/DATE: D. Hardman D. Hardman 1-18-93

APPROVED/DATE: William Tillotson 1-21-93

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 21 Nov. 1996

CONTROL NUMBER: bd 96-012

FROM

STOCK NUMBER	NOMENCLATURE
1376-00-764-8065	Comp A5

TO

STOCK NUMBER	NOMENCLATURE
SAme	Same

FROM SERIAL/LOT NUMBER: SERIAL	FROM SERIAL/LOT NUMBER: LOT	FROM COND	FROM SITE LOCATION	FROM GRID LOCATION	FROM RES SITE	FROM T/S	FROM L/C	FROM METH	FROM MGR	FROM QUANTITY	FROM NO. PKG	FROM UP QTY	TO SERIAL/LOT NUMBER: SERIAL	TO SERIAL/LOT NUMBER: LOT	TO COND	TO SITE LOCATION	TO GRID LOCATION	TO RES SITE	TO T/S	TO L/C	TO METH	TO MGR	TO QUANTITY	TO NO. PKG	TO UP QTY
HOL86J640-346		A	N 96							1860	31		same		A	5 A 1							1860	31	

REMARKS

Boxes moved to 5A1 to be with parent lot

TYPE OF ACTION

- [X] LOCATION CHANGE
- [ ] RECLASSIFICATION
- [ ] SERIAL/LOT NUMBER CHANGE
- [ ] OTHER
- [ ] STOCK NUMBER CHANGE
- [ ] ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR: J Bullock

DATE OF ACTION: 11/21/96

APPROVED/DATE

APPROVED/DATE

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 20 NOv 1996

CONTROL NUMBER: PD 96-011

FROM	STOCK NUMBER	NOMENCLATURE
	1376-00-764-8065	Comp A5

TO	STOCK NUMBER	NOMENCLATURE
	Same	Same

SERIAL/LOT NUMBER (SERIAL)	SERIAL/LOT NUMBER (LOT)	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
HOL86J640-347	A	N96								60	1	

SERIAL/LOT NUMBER (SERIAL)	SERIAL/LOT NUMBER (LOT)	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
Same		H	6 D 2							60	1	

REMARKS

Mice chewed a hole in the top of the box.
and the contents was contaminated with paper,
cardboard and mice droppings. Box placed in
CC H. Bullock

TYPE OF ACTION

- [X] LOCATION CHANGE
- [ ] RECLASSIFICATION
- [ ] SERIAL/LOT NUMBER CHANGE
- [ ] OTHER
- [ ] STOCK NUMBER CHANGE
- [ ] ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR: H. Bullock — DATE OF ACTION: 11/20/96

APPROVED/DATE: [illegible] — 20 NOV 96

APPROVED/DATE:

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 20 Nov 1996

CONTROL NUMBER: PD 96-010

FROM	STOCK NUMBER	NOMENCLATURE	TO	STOCK NUMBER	NOMENCLATURE
	1376-00-832-091	Tetryl		SAme	SAme

FROM SERIAL/LOT NUMBER												TO SERIAL/LOT NUMBER											
SERIAL	LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL	LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
JA 9 415		H	HG359							50	1	Light	Same		H	6 D @							50	1 (light

REMARKS

Item transferred to 6D2 from HG359. All Items remain in CC H.

TYPE OF ACTION

- [X] LOCATION CHANGE
- [ ] RECLASSIFICATION
- [ ] SERIAL/LOT NUMBER CHANGE
- [ ] OTHER
- [ ] STOCK NUMBER CHANGE
- [ ] ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR: J Bullock

DATE OF ACTION: 11/20/96

APPROVED/DATE

APPROVED/DATE

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 20 Nov 1996

CONTROL NUMBER: PD 96-009

FROM

STOCK NUMBER	NOMENCLATURE
1376-00-005-5116	Cyclotol

TO

STOCK NUMBER	NOMENCLATURE
Same	Same

FROM SERIAL/LOT NUMBER: SERIAL	FROM SERIAL/LOT NUMBER: LOT	FROM COND	FROM SITE LOCATION	FROM GRID LOCATION	FROM RES SITE	FROM T/S	FROM L/C	FROM METH	FROM MGR	FROM QUANTITY	FROM NO. PKG	FROM UP QTY	TO SERIAL/LOT NUMBER: SERIAL	TO SERIAL/LOT NUMBER: LOT	TO COND	TO SITE LOCATION	TO GRID LOCATION	TO RES SITE	TO T/S	TO L/C	TO METH	TO MGR	TO QUANTITY	TO NO. PKG	TO UP QTY
HOL90B924-033		H	HG359							120	2		SAme		H	6 D 2							120	2	

REMARKS

All items transferred from HG359 to 6D2. Items remain in CCH.

TYPE OF ACTION

- [X] LOCATION CHANGE
- [ ] RECLASSIFICATION
- [ ] SERIAL/LOT NUMBER CHANGE
- [ ] OTHER
- [ ] STOCK NUMBER CHANGE
- [ ] ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR: J Bullock

APPROVED/DATE

DATE OF ACTION: 11/20/96

APPROVED/DATE

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 20 Nov 1996

CONTROL NUMBER: PD96-008

FROM

STOCK NUMBER	NOMENCLATURE
1376-00-628-3329	Nitroguanidine

TO

STOCK NUMBER	NOMENCLATURE
Same	Sames

SERIAL/LOT NUMBER: SERIAL	SERIAL/LOT NUMBER: LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER: SERIAL	SERIAL/LOT NUMBER: LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
SOW88C019-202		H	HG359							414	9		Same		H	6 D 2							414	9	

REMARKS

All items moved from HG359 to 6 D 2. All items remain in CC H.,

TYPE OF ACTION

- [X] LOCATION CHANGE
- [ ] RECLASSIFICATION
- [ ] SERIAL/LOT NUMBER CHANGE
- [ ] OTHER
- [ ] STOCK NUMBER CHANGE
- [ ] ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

APPROVED/DATE

DATE OF ACTION: 11/20/96

APPROVED/DATE

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 20 Nov 1996

CONTROL NUMBER: PD96-007

FROM

STOCK NUMBER	NOMENCLATURE
1376-00-764-8065	Comp A 5

TO

STOCK NUMBER	NOMENCLATURE
same	Same

FROM SERIAL/LOT NUMBER: SERIAL	FROM SERIAL/LOT NUMBER: LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	TO SERIAL/LOT NUMBER: SERIAL	TO SERIAL/LOT NUMBER: LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
HOL86F640-323		H	HG359							1080	18		same		H	6 D 2							1080	18	
HOL86F640-321		H	HG359							120	2		Same		H	6 D 2							120	2	
HOL86F640-322		H	HG359							2760	46		Same		H	6 D 2							2760	46	
HOL86F640-335		H	HG359							240	4		Same		H	6 D 2							240	4	

REMARKS

All itmes removed from HG359 and stored in 6D2.

TYPE OF ACTION

- [X] LOCATION CHANGE
- [ ] RECLASSIFICATION
- [ ] SERIAL/LOT NUMBER CHANGE
- [ ] OTHER
- [ ] STOCK NUMBER CHANGE
- [ ] ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR: [signature]

APPROVED/DATE

DATE OF ACTION: 11/20/96

APPROVED/DATE

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: Oct. 15, 1996

CONTROL NUMBER: PD 96-006

FROM STOCK NUMBER	NOMENCLATURE	TO STOCK NUMBER	NOMENCLATURE
1376-00-764-8065	Composition A 5	1376-00-764-8065	Composition A 5

SERIAL/LOT NUMBER SERIAL	SERIAL/LOT NUMBER LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
HOL86H640-335		A	J67							240 lbs	4	

SERIAL/LOT NUMBER SERIAL	SERIAL/LOT NUMBER LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
HOL86H640-335		H	HG 359							240	4	

REMARKS

Dunnage retained moisture causing the boxes to deteriorate contaminating the contents with small pieces of cardboard and paper liner.

TYPE OF ACTION

- [X] LOCATION CHANGE
- [ ] SERIAL/LOT NUMBER CHANGE
- [ ] STOCK NUMBER CHANGE
- [X] RECLASSIFICATION
- [ ] OTHER
- [ ] ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR: J Bullock

DATE OF ACTION: 15 Oct 96

APPROVED/DATE: [illegible] 15 OCT 96

APPROVED/DATE:

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: Oct. 15, 1996

CONTROL NUMBER: PD 96-005

FROM

STOCK NUMBER	NOMENCLATURE
1376-00-764-8065	Comp A 5 (Cyclotrimethylenetrinitramine)

TO

STOCK NUMBER	NOMENCLATURE
1376-00-764-8065	Comp A5

SERIAL/LOT NUMBER (FROM)		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER (TO)		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
SERIAL	LOT												SERIAL	LOT											
HOL86F640-322		A	J63							2760	46		HOL86F640-322		H	Hg359							2760	46	
HOL86F640-323		A	J63							1020	17		HOL86F640-323		H	HG359							1020	17	

REMARKS

The dunnage of the last 4 rows in block stowage held moisture against the boxes. These boxes deteriorated and contaminated the contents with cardboard and paper.

TYPE OF ACTION

- [X] LOCATION CHANGE
- [ ] SERIAL/LOT NUMBER CHANGE
- [ ] STOCK NUMBER CHANGE
- [X] RECLASSIFICATION
- [ ] OTHER
- [ ] ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR: J Bullock

DATE OF ACTION: Oct. 1 1996

APPROVED/DATE:

APPROVED/DATE: 15 Oct 96

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: Aug 28, 1996

CONTROL NUMBER: PD 96-004

FROM

STOCK NUMBER	NOMENCLATURE
1376-00-764-8065	Comp A5

TO

STOCK NUMBER	NOMENCLATURE
1376-00-764-8065	Comp A5

SERIAL/LOT NUMBER (SERIAL)	SERIAL/LOT NUMBER (LOT)	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
HOL86F640-321		A	J60							120	2	
HOL86F640-323		A	J63							60	1	

SERIAL/LOT NUMBER (SERIAL)	SERIAL/LOT NUMBER (LOT)	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
HOL86F640-321		H	HG359							120	2	
HOL86F640-323		H	HG359							60	1	

REMARKS

Boxes had the corners of the boxes chewed open by mice. The contents was contaminated with mice dropping and cardboard.

TYPE OF ACTION

- [X] LOCATION CHANGE
- [ ] SERIAL/LOT NUMBER CHANGE
- [ ] STOCK NUMBER CHANGE
- [X] RECLASSIFICATION
- [ ] OTHER
- [ ] ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR: [signature]

DATE OF ACTION: 8/27/96

APPROVED/DATE: [signature] 8/28/96

APPROVED/DATE:

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 1 Aug 96

CONTROL NUMBER: PD96-003

FROM

STOCK NUMBER	NOMENCLATURE
1376-00-005-5116	Cyclotol, 70/30

TO

STOCK NUMBER	NOMENCLATURE
1376-00-005-5116	Cyclotol,70/30

SERIAL/LOT NUMBER (SERIAL)	SERIAL/LOT NUMBER (LOT)	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
HOL90B924-033	A	B3								120 lbs	2	

SERIAL/LOT NUMBER (SERIAL)	SERIAL/LOT NUMBER (LOT)	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
HOL90B924-033	H	HG359								120 lbs	2	

REMARKS

July 30, 1996, during outloading two boxes of the above lot were found with bottoms that had drawn dampness and deteriorated. The liners also had deteriorated enough to allow the cardboard, from the deteriorated bottoms, to contaminate the contents.

TYPE OF ACTION

- [x] LOCATION CHANGE
- [x] RECLASSIFICATION
- [ ] SERIAL/LOT NUMBER CHANGE
- [ ] OTHER
- [ ] STOCK NUMBER CHANGE
- [ ] ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR: J Bullock

DATE OF ACTION: 7/30/96

APPROVED/DATE: [illegible] 8/1/96

APPROVED/DATE:

DA FORM 1 MAY 76 4508

Posted 12/11/92

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 12/11/92 | CONTROL NUMBER: M1338

STOCK NUMBER	NOMENCLATURE
3760105588597	Propellant M1 SP How 8" GB Cu 4.5

TO: STOCK NUMBER: SCRAP AND SALVAGE | NOMENCLATURE: SAME

SERIAL/LOT NUMBER SERIAL	LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
BAJ	68357	E	BA404							139910		
	"	F	SM3							31154		
	"	F	BA400							70400		
BAJ	68358	E	BA404							288969		
BAJ	68359	E	BA404							70839		
	"	E	BA405							227590		
BAJ	68360	E	BA405							219339		
	"	E	BA406							79860		
BAJ	68361	E	BA406							298759		
DAAD78A069800		F	BA400							104500		
	"	F	BA401							198107		
DAAD78A069809		F	BA401							211199		
	"	F	SM3							91299		

SERIAL/LOT NUMBER SERIAL	LOT
SAME	

COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
SAME	Location and Qty remain the same.									

All figures according to Accountable Records.

REMARKS: Transfer to Scrap & Salvage per Amccom 3 Dec 92 letter AMSMC-PDJ-I

TYPE OF ACTION:
- [ ] LOCATION CHANGE
- [ ] SERIAL/LOT NUMBER CHANGE
- [ ] STOCK NUMBER CHANGE
- [X] RECLASSIFICATION
- [ ] OTHER
- [ ] ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR: [signature] | DATE OF ACTION: 12/11/92

APPROVED BY/DATE: [signature] 12/11/92

FORM 1 MAY 78 4508

Printed 12/17/92

REPLY TO
ATTENTION OF

AMSMC-PDJ-I (740(B))

3 DEC 1992

MEMORANDUM FOR Commander's Representative, Ravenna Army Ammunition Plant, ATTN: SMCRV-CA, Ravenna, OH 44266-9297

SUBJECT: Propellant M1 SP .016, NSN 1376-01-055-8597

1. No production requirements or alternative use/user have been identified for the 2,032,920 pounds of subject material to date. Therefore, the contractor should offer subject propellant for sale through the Defense Reutilization and Marketing Region. The propellant will be retained in the Conventional Ammunition Working Capital Fund account pending notification of the results of sale to Headquarters, U.S. Army Armament Munitions, and Chemical Command. Further disposition will be provided by this office at that time. Appropriate release documents will be issued at the time the material is ready to be physically removed from Ravenna Army Ammunition Plant.

2. If additional information is required, contact Mrs. Mary Ann Petruccelli, AMSMC-PDJ-I, DSN 793-4231.

Patricia J. Harmon

PATRICIA J. HARMON
Contracting Officer

TO	OFFICE	ACTION
	GM	
	CO-COR	
	ACCTG	
	SEC	
	ENGR	
	IR	
	S&T&O	
	P&CA	
	SAF	
	DPM	
	RETURN	

General Manager
Ravenna Arsenal, Inc.
FWD FOR
☐ Information
☐ Compliance as applicable
☐ Reply NLT

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 12/28/92

CONTROL NUMBER: PD 40-92

FROM

STOCK NUMBER: BLDG 1035

NOMENCLATURE: MARINE SHIPMENTS

TO

STOCK NUMBER: 1-C 13

NOMENCLATURE: MARINE SHIPMENTS

FROM SERIAL/LOT NUMBER: SERIAL	FROM SERIAL/LOT NUMBER: LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	TO SERIAL/LOT NUMBER: SERIAL	TO SERIAL/LOT NUMBER: LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
CTG. 7.62 MM BLANK		A											CTG. 7.62 MM BLANK		A	1-C13									
LC 90GL22.053		A	BLD 1035						COLUMBUS MAR	2400	3		LC 90GL22.053		A	1-C13						COLUMBUS MAR	2400	3	
CTG. 22 CAL BLANK													CTG. 22 CAL BLANK												
LOT RA 5001		A							Y TWN MAR	250	1		LOT RA 5001		A							Y TWN MAR	250	1	

REMARKS: SHIPMENT SENT BY UPS AND WAS DELIVERED TO SHIPPING AND [illegible] BLDG 1035. ITEMS MOVED TO 16L00

DA [illegible]

TYPE OF ACTION

- [X] LOCATION CHANGE
- [ ] RECLASSIFICATION
- [ ] SERIAL/LOT NUMBER CHANGE
- [ ] OTHER

[illegible] CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR: J Bullock

APPROVED/DATE: William M. Webster 1-27-93

APPROVED/DATE:

DI

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 12/17/92

CONTROL NUMBER: PO 39-92

FROM

STOCK NUMBER: 1C13

NOMENCLATURE: M-13 TRACERS F/152MM

TO

STOCK NUMBER: BURNING GNDS

NOMENCLATURE: SAME

FROM SERIAL/LOT NUMBER: SERIAL	FROM SERIAL/LOT NUMBER: LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	TO SERIAL/LOT NUMBER: SERIAL	TO SERIAL/LOT NUMBER: LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
TRACERS		H	1C13							24			TRACERS			BURNING								
M-13													M-13			GROUNDS								

REMARKS: TO BURNING GROUNDS

TYPE OF ACTION

- [x] LOCATION CHANGE
- [ ] SERIAL/LOT NUMBER CHANGE
- [ ] STOCK NUMBER CHANGE
- [ ] RECLASSIFICATION
- [ ] OTHER
- [ ] ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR: J Bullock

DATE OF ACTION: 12/17/92

APPROVED/DATE: 12/18/92

APPROVED/DATE: 1-27-93

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: December 9, 1992

CONTROL NUMBER: PD-38-92

FROM

STOCK NUMBER	NOMENCLATURE
1376-00-628-3386	Comp B

TO

STOCK NUMBER	NOMENCLATURE
Same	Same

FROM SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	TO SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG
SERIAL	LOT												SERIAL	LOT										
HOL-053-~~215~~ 126 dw		A	4-D-10							60#(1 box)					H	Same							Same	

REMARKS

1 box (60#) to CC-H, material to be used as donor material for demolition, box contaminated and is the only remaining box of this lot.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☑ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

DATE C

APPROVED/DATE
J. Bullock J Bullock 12-9-92

APPROVED/DATE
W. Wheaton William Wheaton

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: Nobember 9, 1992

CONTROL NUMBER: BD 92 37

FROM

STOCK NUMBER	NOMENCLATURE
0637-01-N85-006	Reload Kit for Exp Act. for APE 1001M1 E091

TO

STOCK NUMBER	NOMENCLATURE
Same	Same

SERIAL/LOT NUMBER (FROM)		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER (TO)		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG
SERIAL	LOT												SERIAL	LOT										
0637-01-N85-006		A	JB-605							1	1		0637-01-N85-006		A	LL#1 CB 14-Bay C							1	1

REMARKS: Transferred Reload Kit from JB-605 to Load Line #1 CB 14, Bay C, installed in APE 1001M1

TYPE OF ACTION

- [x] LOCATION CHANGE
- [ ] SERIAL/LOT NUMBER CHANGE
- [ ] STOCK NUMBER CHANGE
- [ ] RECLASSIFICATION
- [ ] OTHER
- [ ] ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

DATE

APPROVED/DATE: G. L. Wolfgang 11-9-92

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: October 6, 1992

CONTROL NUMBER: PD-36-92

FROM

STOCK NUMBER	NOMENCLATURE
1376-00-628-3306	Comp B

TO

STOCK NUMBER	NOMENCLATURE
Same	Same

FROM SERIAL/LOT NUMBER: SERIAL	FROM SERIAL/LOT NUMBER: LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	TO SERIAL/LOT NUMBER: SERIAL	TO SERIAL/LOT NUMBER: LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG
Unknown lot -		A	4-D-13							1			Same		H	Same							Same	
HOL-050-5895	found on lot 119																							
Unknown lot -red tagged		A	6-D-9							1			Same		H	Same							Same	

found on lot 119 HOL

REMARKS

During outloading, boxes were found with no lot identity, recommend the 2 boxes be placed in CC-H and used as donor material for demil.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☐ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

DATE

APPROVED/DATE: J. Bullock J. Bullock 10-6-92

APPROVED/DATE: W. Wheaton W. Wheaton 10-6-92

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: August 19, 1992

CONTROL NUMBER: PD-35-92

FROM	STOCK NUMBER	NOMENCLATURE
	1376-00-628-3306	Comp B

TO	STOCK NUMBER	NOMENCLATURE
	Same	Same

FROM SERIAL/LOT NUMBER: SERIAL	FROM SERIAL/LOT NUMBER: LOT	FROM COND	FROM SITE LOCATION	FROM GRID LOCATION	FROM RES SITE	FROM T/S	FROM L/C	FROM METH	FROM MGR	FROM QUANTITY	FROM NO. PKG	FROM UP QTY	TO SERIAL/LOT NUMBER: SERIAL	TO SERIAL/LOT NUMBER: LOT	TO COND	TO SITE LOCATION	TO GRID LOCATION	TO RES SITE	TO T/S	TO L/C	TO METH	TO MGR	TO QUANTITY	TO NO. PKG
HOL-053-192		E	1-B-1							5 boxes			Same		A	Same							Same	
HOL-053-187		E	1-B-2							1 box					A									
HOL-053-142		E	1-B-5							1 box					A									
HOL-053-143		E	1-B-5							1 box					A									
HOL-053-151		E	3-B-13							1 box					A									
HOL-053-64		E	M-94							3 boxes					A									
HOL-053-68		E	M-95							1 box					A									
HOL-053-77		E	P-117							1 box					A									
HOL-053-69		E	P-118							1 box					A									
HOL-053-63		E	P-122							1 box					A									
HOL-053-5398		E	Q-134							2 boxes					A									

REMARKS: Boxes above to CC-A, all labels replaced on 7-27-92.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☒ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

DATE

APPROVED/DATE: J. Bullock J Bullock 8-19-92

APPROVED/DATE: [signature] 8-27-92

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: July 31, 1992

CONTROL NUMBER: PD 84-92

FROM

STOCK NUMBER	NOMENCLATURE
1376-00-628-3306	Comp B

TO

STOCK NUMBER	NOMENCLATURE
Same	Same

SERIAL/LOT NUMBER (SERIAL)	SERIAL/LOT NUMBER (LOT)	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
HOL-053-5397		E	Q-135							1 box		
-189			1-B-2							"		
-57			M-93							"		
-180			4-B-9							"		
-151			2-B-2							"		
-227			L-81							"		
-83			O-111							6 boxes		
-87			K-76							1 box		
-46			N-101							"		

SERIAL/LOT NUMBER (SERIAL)	SERIAL/LOT NUMBER (LOT)	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG
Same		A									

REMARKS: Boxes to CC-A, box tops replaced 7-8-92.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☑ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

APPROVED/DATE: D. Hardman D Hardman 7-31-92

APPROVED/DATE: [signature] 3 Aug 92

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: July 31, 1992

CONTROL NUMBER: PD 33-92

FROM	STOCK NUMBER	NOMENCLATURE
	1376-00-628-3306	Comp B

TO	STOCK NUMBER	NOMENCLATURE
	Same	Same

SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
SERIAL	LOT											
HOL-053-42		E	P-125							135 boxes		
-053-43		E	"							1 box		

SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG
SERIAL	LOT										
Same		A								Same	
"		A								5	

REMARKS: Boxes to CC-A, mixed lots have been separated.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☑ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

DAT

APPROVED/DATE: D. Hardman 7-31-92

APPROVED/DATE: 3 Aug 92

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: October 29, 1992

CONTROL NUMBER: PD 33-9..

FROM

STOCK NUMBER	NOMENCLATURE
1376-00-764-8065	Composition A-5

TO

STOCK NUMBER	NOMENCLATURE
Same	Same

SERIAL/LOT NUMBER (FROM)		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	LC	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER (TO)		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	LC	METH	MGR	QUANTITY
SERIAL	LOT												SERIAL	LOT									
HOL86J640-346		E	5-A-1							84960					A	Same							Same
"		E	N-96							1860					A	"							"
HOL86K640-349		E	N-96							50400					A	"							"
"		E	N-97							69960					A	"							"
HOL87K641-429		E	5-D-3							34080					A	"							"
"		E	5-D-4							54960					A	"							"
HOL88A640-452 ****		E	5-D-5							53880					A	"							"
"		E	5-D-10							30420					A	"							"
HOL88B641-457		E	5-D-12							33660					A	"							"
"		E	5-D-8							42960					A	"							"
"		E	6-D-13							7260					A	"							"
HOL88B641-458		E	5-D-8							61440					A	"							"
"		E	6-D-13							41760					A	"							"
HOL88C641-464		E	5-D-13							42120					A	"							"
"		E	6-D-8							40560					A	"							"
"		E	6-D-14							9300					A	"							"
"		E	7-D-3							1320					A	"							"
HOL89G640-587		E	N-104							125640					A	"							"

REMARKS

ALL LOTS AND QUANTITIES TO CC-A, OVERPACKED IN APRIL 1992.

****NOTE RA-444 July 17, 1992, outer packs must have lot number correct at time of shipment. Outer packs are marked with lot HOL88A640-452, correct lot number is HOL88A641-452.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☐ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

APPROVED/DATE: J. Bullock J Bullock 10-29-92

APPROVED/DATE: W. Wheaton William Wheaton 10/29/92

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: October 29, 1992

CONTROL NUMBER: PD 32-92

FROM

STOCK NUMBER	NOMENCLATURE
1376-01-066-4158	PBX 0280 Type III

TO

STOCK NUMBER	NOMENCLATURE
Same	Same

SERIAL/LOT NUMBER (FROM)		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER (TO)		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG
SERIAL	LOT												SERIAL	LOT										
H0L89J767-028		E	1-D-2							2900#			Same		A	Same							Same	

REMARKS: LOT TO CC-A, / packed in April 1992.

OVER

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☐ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

DATE

APPROVED/DATE: J. Bullock J. Bullock 10-29-92

APPROVED/DATE: W. Wheaton 10/29/92

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: July 31, 1992

CONTROL NUMBER: PD 32-92

FROM

STOCK NUMBER	NOMENCLATURE
1376-00-628-3306	Comp B

TO

STOCK NUMBER	NOMENCLATURE
Same	Same

FROM SERIAL/LOT NUMBER: SERIAL	FROM SERIAL/LOT NUMBER: LOT	FROM COND	FROM SITE LOCATION	FROM GRID LOCATION	FROM RES SITE	FROM T/S	FROM L/C	FROM METH	FROM MGR	FROM QUANTITY	FROM NO. PKG	FROM UP QTY	TO SERIAL/LOT NUMBER: SERIAL	TO SERIAL/LOT NUMBER: LOT	TO COND	TO SITE LOCATION	TO GRID LOCATION	TO RES SITE	TO T/S	TO L/C	TO METH	TO MGR	TO QUANTITY	TO NO. PKG
HOL-053-187		E	1-B-2							2 boxes					A	Same							Same	

REMARKS

TO BOXES TO CC-A, box bottoms were replaced on 7-1-92.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☑ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

DATE

APPROVED/DATE: D. Hardman 7-31-92

APPROVED/DATE: 3 Aug 92

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: October 22, 1992

CONTROL NUMBER: PD 31-92

FROM	STOCK NUMBER	NOMENCLATURE	TO	STOCK NUMBER	NOMENCLATURE
	1376-00-628-3306	Comp B		Same	Same

SERIAL/LOT NUMBER (SERIAL)	SERIAL/LOT NUMBER (LOT)	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER (SERIAL)	SERIAL/LOT NUMBER (LOT)	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG
HOL-053-125*		A	7-D-4							8 boxes			Same		E								Same	
HOL-053-125**		A	7-D-4							3 boxes			Same		H								Same	



REMARKS

*8 boxes to CC-E, to be repacked.
**3 boxes to CC-H, to be demiled.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☑ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

DATE

APPROVED/DATE
J. Bullock J Bullock 10-22-92

APPROVED/DATE
W. Wheaton 10-23-92

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: July 31, 1992

CONTROL NUMBER: PD 3-92

FROM

STOCK NUMBER	NOMENCLATURE
1376-00-628-3306	~~Nitro~~ Comp B

TO

STOCK NUMBER	NOMENCLATURE
Same	Same

SERIAL/LOT NUMBER (FROM)		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER (TO)		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG
SERIAL	LOT												SERIAL	LOT										
HOL-050-5077		E	2-E-1							60#(1 box)			Same		A								Same	

REMARKS: 1 box (60#) to CC-A, repacked 4-27-92

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☑ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

DATE

APPROVED/DATE: D. Hardman D. Hardman 7-31-92

APPROVED/DATE: [signature] 3 Aug 92

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: July 31, 1992

CONTROL NUMBER: PD 30-92

FROM

STOCK NUMBER	NOMENCLATURE
1376-00-628-3306	~~Nitro~~ comp B

TO

STOCK NUMBER	NOMENCLATURE
Same	Same

FROM SERIAL/LOT NUMBER												TO SERIAL/LOT NUMBER											
SERIAL	LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL	LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG
HOL-050-5076		E	2-E-1							1 box			Same		A	Same							Same	

REMARKS

TO CC-A, 1 box repacked 4-27-92.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☑ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

DATE

APPROVED/DATE: D. Hardman D Hardman 7-31-92

APPROVED/DATE: [signature] 3 Aug 92

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: July 31, 1992

CONTROL NUMBER: PD 29-92

FROM STOCK NUMBER	NOMENCLATURE	TO STOCK NUMBER	NOMENCLATURE
1376-00-628-3306	~~Nitro~~ Comp B	Same	Same

SERIAL/LOT NUMBER (SERIAL / LOT)	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER (SERIAL / LOT)	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG
HOL-053-231	E	L-85							3 boxes - rear flaps			Same	A	Same							Same	
-050-5044	E	7-E-6							1 box - fron and rear flaps			Same	S	S							S	

REMARKS: BOXES TO CC-A, ALL FLAPS RETAPED 7-8-92

TYPE OF ACTION

- [ ] LOCATION CHANGE
- [ ] SERIAL/LOT NUMBER CHANGE
- [ ] STOCK NUMBER CHANGE
- [x] RECLASSIFICATION
- [ ] OTHER
- [ ] ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

DATE

APPROVED/DATE: D. Hardman D. Hardman 7-31-92

APPROVED/DATE: William [illegible] 3 Aug 92

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: July 31, 1992

CONTROL NUMBER: PD 28-92

FROM STOCK NUMBER	NOMENCLATURE	TO STOCK NUMBER	NOMENCLATURE
1376-00-628-3306	Comp B	Same	Same

SERIAL/LOT NUMBER (FROM)		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER (TO)		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG
SERIAL	LOT												SERIAL	LOT										
HOL-053-189		E	1-B-1							1 box			Same		A	Same							Same	
-137		E	1-B-3							1 box														
-149		E	2-B-3							1 box - rear flap														
-150		E	2-B-3							1 box - rear flap														
-150		E	"							1 box - front flap														
-143		E	3-B-12							3 box - front flap			RA444 indicated 3 boxes											
-144		E	"							1 box - rear flap														
-49		E	M-89							1 box - rear flap														
-58		E	M-90							2 boxes - rear flaps														
-82		E	M-93							2 boxes														
-345		E	P-126							2 boxes - rear flaps														
-5398		E	Q-134							2 boxes - rear flaps														
-5397		E	Q-135							1 box - rear flap														
-237		E	Q-138							4 boxes - rear flaps														
-227		E	K-72							2 boxes - rear flaps														
"		E	L-80							2 rear flaps - 1 front flap														
"		E	L-84							1 box														

REMARKS

BOXES TO CC-A, all flaps retaped 7-8-92

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☑ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

DAT

APPROVED/DATE

D. HARDMAN D. Hardman 7-31-92

APPROVED/DATE

7 Aug 92

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 7-22-92

CONTROL NUMBER: PD-27-92

FROM STOCK NUMBER	NOMENCLATURE	TO STOCK NUMBER	NOMENCLATURE
1376-01-192-4164	Propellant, WC 844 f/M855	Same	Same

FROM SERIAL/LOT NUMBER: SERIAL	FROM SERIAL/LOT NUMBER: LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	TO SERIAL/LOT NUMBER: SERIAL	TO SERIAL/LOT NUMBER: LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG
OMF87A-049158		D	BC-415							5080			Same		A	Same								
OMF87K-049278		D	BC-416							4080			Same		A	Same								

REMARKS

LOTS TO CC-A, LOADING AUTHORIZATION HAS BEEN EXTENDED UNTIL 1994, REFERENCE: AMSMC-QAM-A (715w) 30 JUNE 1992, SUBJECT: REASSESSMENT OF PROPELLANT LOTS

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☐ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

DATE

APPROVED/DATE
J. BULLOCK J Bullock

APPROVED/DATE
W. WHEATON

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: June 12, 1992

CONTROL NUMBER: PD 26-92

FROM STOCK NUMBER	NOMENCLATURE	TO STOCK NUMBER	NOMENCLATURE
1376-00-628-3306	Comp B	Same	Same

SERIAL/LOT NUMBER (SERIAL / LOT)	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER (SERIAL / LOT)	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG
HOL-053-42	A	P-125							135 boxes			Same	E	Same							Same	
HOL-053-43	A	"							1 box			Same	E	Same							Same	

REMARKS

Quantities of boxes above to CC-E, 1 box of lot HOL-053-43 is mixed in w/rear stack of HOL-053-42 in igloo, rear stack contains 135 boxes of HOL-053-42 & 1 box of HOL-053-43, box to be separated prior to shpt to insure that mixed lots are not shipped.

TYPE OF ACTION

- [ ] LOCATION CHANGE
- [ ] SERIAL/LOT NUMBER CHANGE
- [ ] STOCK NUMBER CHANGE
- [x] RECLASSIFICATION
- [ ] OTHER
- [ ] ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

DATE

APPROVED/DATE: [signature] 6-12-92

APPROVED/DATE: D. Hardman [signature] 6-12-92

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: July 31, 1992

CONTROL NUMBER: PD 32-92

FROM	STOCK NUMBER	NOMENCLATURE
	1376-00-628-3306	Comp B

TO	STOCK NUMBER	NOMENCLATURE
	Same	Same

SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
SERIAL	LOT											
HOL-053-187		E	1-B-2							2 boxes		

SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG
SERIAL	LOT										
		A	Same							Same	

REMARKS: TO BOXES TO CC-A, box bottoms were replaced on 7-1-92.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☑ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

DATE

APPROVED/DATE: D. Hardman 7-31-92

APPROVED/DATE: 3 Aug 92

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: October 22, 1992

CONTROL NUMBER: PD 31-92

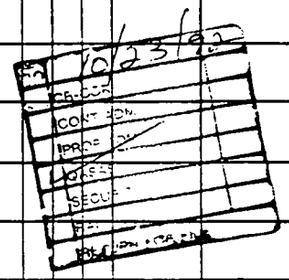
FROM

STOCK NUMBER	NOMENCLATURE
1376-00-628-3306	Comp B

TO

STOCK NUMBER	NOMENCLATURE
Same	Same

SERIAL/LOT NUMBER (SERIAL)	SERIAL/LOT NUMBER (LOT)	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER (SERIAL)	SERIAL/LOT NUMBER (LOT)	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG
HOL-053-125*		A	7-D-4							8 boxes			Same		E								Same	
HOL-053-125**		A	7-D-4							3 boxes			Same		H								Same	



REMARKS

*8 boxes to CC-E, to be repacked.
**3 boxes to CC-H, to be demiled.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☑ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

DATE

APPROVED/DATE: J. Bullock J. Bullock 10-22-92

APPROVED/DATE: W. Wheaton 10-23-92

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: July 31, 1992

CONTROL NUMBER: PD 3-92

FROM

STOCK NUMBER: 1376-00-628-3306

NOMENCLATURE: ~~Nitro~~ Comp B

TO

STOCK NUMBER: Same

NOMENCLATURE: Same

SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
SERIAL	LOT											
HOL-050-5077		E	2-E-1							60#(1 box)		

SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG
SERIAL	LOT										
Same		A								Same	

REMARKS: 1 box (60#) to CC-A, repacked 4-27-92

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☑ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

DATE

APPROVED/DATE: D. Hardman D. Hardman 7-31-92

APPROVED/DATE: [signature] 3 Aug 92

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: July 31, 1992

CONTROL NUMBER: PD 30-92

FROM

STOCK NUMBER	NOMENCLATURE
1376-00-628-3306	~~Nitro~~ comp B

TO

STOCK NUMBER	NOMENCLATURE
Same	Same

FROM SERIAL/LOT NUMBER: SERIAL	FROM SERIAL/LOT NUMBER: LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	TO SERIAL/LOT NUMBER: SERIAL	TO SERIAL/LOT NUMBER: LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG
HOL-050-5076		E	2-E-1							1 box			Same		A	Same							Same	

REMARKS

TO CC-A, 1 box repacked 4-27-92.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☒ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

DATE

APPROVED/DATE: D. Hardman D Hardman 7-31-92

APPROVED/DATE: [signature] 3 Aug 92

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: July 31, 1992

CONTROL NUMBER: PD 29-92

FROM — STOCK NUMBER: 1376-00-628-3306 — NOMENCLATURE: ~~Nitro~~ Comp B

TO — STOCK NUMBER: Same — NOMENCLATURE: Same

SERIAL/LOT NUMBER (SERIAL / LOT)	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER (SERIAL / LOT)	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG
HOL-053-231	E	L-85							3 boxes - rear flaps			Same	A	Same							Same	
-050-5044	E	7-E-6							1 box - fron and rear flaps			Same	S	S							S	

REMARKS: BOXES TO CC-A, ALL FLAPS RETAPED 7-8-92

TYPE OF ACTION:
- [ ] LOCATION CHANGE
- [ ] SERIAL/LOT NUMBER CHANGE
- [ ] STOCK NUMBER CHANGE
- [x] RECLASSIFICATION
- [ ] OTHER
- [ ] ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR:

DATE:

APPROVED/DATE: D. Hardman D. Hardman 7-31-92

APPROVED/DATE: William Wheeler 3 Aug 92

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: June 11, 1992

CONTROL NUMBER: PD 23-92

STOCK NUMBER	NOMENCLATURE
1376-00-628-3306	Comp B

TO

STOCK NUMBER	NOMENCLATURE
Same	Same

SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG
SERIAL	LOT												SERIAL	LOT										
HOL-053-192		A	1-B-1							5 boxes - tattered labels			Same		E	Same							Same	
HOL-053-187		A	1-B-2							1 box - tattered label			Same		E	Same							Same	
HOL-053-142		A	1-B-5							1 box - tattered label			Same		E	Same							Same	
HOL-053-143		A	"							1 box - tattered label			Same		E	Same							Same	
HOL-053-151		A	3-B-13							1 box - torn label			Same		E	Same							Same	
HOL-053-64		A	M-94							3 boxes - torn labels			Same		E	Same							Same	
HOL-053-68		A	M-95							1 box - torn label			Same		E	Same							Same	
HOL-053-77		A	P-117							1 box - loose - torn label			Same		E	Same							Same	
HOL-053-69		A	P-118							1 box - torn label			Same		E	Same							Same	
HOL-053-63		A	P-122							1 box - torn label			Same		E	Same							Same	
HOL-053-5398		A	Q-134							2 boxes - tattered labels			Same		E	Same							Same	

REMARKS

Above quantities of boxes to CC-E, torn/tattered labels to be replaced prior to shipment.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☑ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

DATE OF AC

APPROVED/DATE: D. Hardman D Hardman 6-11-92

APPROVED/DATE: William L Heath 6-12-92

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: June 11, 1992

CONTROL NUMBER: PD 22-92

FROM STOCK NUMBER	FROM NOMENCLATURE	TO STOCK NUMBER	TO NOMENCLATURE
1376-00-628-3306	Comp B	Comp B	Comp B

FROM SERIAL/LOT NUMBER: SERIAL	FROM SERIAL/LOT NUMBER: LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	TO SERIAL/LOT NUMBER: SERIAL	TO SERIAL/LOT NUMBER: LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG
HOL-053-5397		A	Q-135							1 box			Same		E	Same							Same	
HOL-053-189		A	1-B-2							1 box			Same		E	Same							Same	
HOL-053-57		A	M-93							1 box			Same		E	Same							Same	
HOL-053-180		A	4-B-9							1 box			Same		E	Same							Same	
HOL-053-151		A	2-B-2							1 box			Same		E	Same							Same	
HOL-053-227		A	L-81							1 box			Same		E	Same							Same	
HOL-053-83		A	O-111							6 boxes			Same		E	Same							Same	
HOL-053-87		A	K-76							1 box			Same		E	Same							Same	
HOL-053-46		A	N-101							1 box			Same		E	Same							Same	

REMARKS

The above boxes to CC-E, box tops and labels/ markings to be replaced prior to shipment. 1

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☑ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

DATE OF AC

APPROVED/DATE: D. Hardman D. Hardman 6-11-92

APPROVED/DATE: William Webster 6-12-92

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: June 11, 1992

CONTROL NUMBER: PD 20-92

STOCK NUMBER	NOMENCLATURE	TO STOCK NUMBER	NOMENCLATURE
1376-00-628-3306	Comp B	Same	Same

SERIAL/LOT NUMBER (SERIAL / LOT)	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER (SERIAL / LOT)	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG
HOL-053-46	A	N-101							1 box			Same	H	Same							Same	

REMARKS: 1 box to CC-H, rodent infestation, to be demiled.

TYPE OF ACTION

- [ ] LOCATION CHANGE
- [ ] SERIAL/LOT NUMBER CHANGE
- [ ] STOCK NUMBER CHANGE
- [x] RECLASSIFICATION
- [ ] OTHER
- [ ] ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

DATE OF AC

APPROVED/DATE: D. Hardman D. Hardman 6-11-92

APPROVED/DATE: William Wheeler 6-12-92

A FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: June 11, 1992

CONTROL NUMBER: OD-19-92

STOCK NUMBER	NOMENCLATURE
1376-00-628-3306	Comp B

TO	STOCK NUMBER	NOMENCLATURE
	Same	Same

SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG
SERIAL	LOT												SERIAL	LOT										
HOL-053-189		A	1-B-1							1 box			Same		E	Same							Same	
HOL-053-137		A	1-B-3							1 box			Same		E	Same							Same	
HOL-053-149		A	2-B-3							1 box - rear flap			Same		E	Same							Same	
HOL-053-150		A	2-B-3							1 box - rear flap			Same		E	Same							Same	
"		A	"							1 box = front flap			Same		E	Same							Same	
HOL-053-143		A	3-B-12							1 box - front flap			Same		E	Same							Same	
HOL-053-144		A	"							1 box - rear flap			Same		E	Same							Same	
HOL-053-49		A	M-89							1 box - rear flap			Same		E	Same							Same	
HOL-053-58		A	M-90							2 boxes - rear flaps			Same		E	Same							Same	
HOL-053-82		A	M-93							2 boxes			Same		E	Same							Same	
HOL-053-345		A	P-126							2 boxes - rear flaps			Same		E	Same							Same	
HOL-053-5398		A	Q-134							2 boxes - rear flaps			Same		E	Same							Same	
HOL-053-5397		A	Q-135							1 box - rear flap			Same		E	Same							Same	
HOL-053-237		A	Q-138							4 boxes - rear flaps			Same		E	Same							Same	
HOL-053-227		A	K-72							2 boxes - rear flaps			Same		E	Same							Same	
"		A	L-80							2 rear flaps - 1 front flap			Same		E	Same							Same	
"		A	L-84							1 box			Same		E	Same							Same	

REMARKS

Boxes & quantities to CC-E for defects stated above, to be repaired/repacked prior to shipment.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☑ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

APPROVED/DATE: D. Hardman 6-11-92

APPROVED/DATE: 6-12-92

DATE OF A

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: June 1, 1992

CONTROL NUMBER: PD-18-92

FROM

STOCK NUMBER: 1376-00-628-3306

NOMENCLATURE: Comp B

TO

STOCK NUMBER: Same

NOMENCLATURE: Same

FROM SERIAL/LOT NUMBER: SERIAL	FROM SERIAL/LOT NUMBER: LOT	FROM COND	FROM SITE LOCATION	FROM GRID LOCATION	FROM RES SITE	FROM T/S	FROM L/C	FROM METH	FROM MGR	FROM QUANTITY	FROM NO. PKG	FROM UP QTY	TO SERIAL/LOT NUMBER: SERIAL	TO SERIAL/LOT NUMBER: LOT	TO COND	TO SITE LOCATION	TO GRID LOCATION	TO RES SITE	TO T/S	TO L/C	TO METH	TO MGR	TO QUANTITY	TO NO. PKG
HOL-053-226		E	M-87							*****			HOL-053-226		A	M-87							*****	
HOL-053-165		E	M-87							*****			HOL-053-165		A	M-87							*****	

REMARKS

*****Boxes reported on PD-11-92 to CC-A, two (2) rows moved from rear to front of igloo and 12 boxes repacked because of dampness.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☒ RECLASSIFICATION
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ OTHER
- ☐ STOCK NUMBER CHANGE
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

DATE OF ACT

APPROVED/DATE: J. Bullock 6-1-92

APPROVED/DATE: 6-2-92

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: June 1, 1992

CONTROL NUMBER: PD-17-92

FROM

STOCK NUMBER	NOMENCLATURE
1376-00-628-3306	Comp B

TO

STOCK NUMBER	NOMENCLATURE
Same	Same

SERIAL/LOT NUMBER (FROM)		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER (TO)		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG
SERIAL	LOT												SERIAL	LOT										
HOL-053-57		E	M-93							60#(1 box)					A	M-93							60#(1 box)	

REMARKS: 60#(1 box) to CC-A, repacked 5-6-92.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☒ RECLASSIFICATION
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ OTHER
- ☐ STOCK NUMBER CHANGE
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

DATE OF AC

APPROVED/DATE: J. Bullock 6-2-92

APPROVED/DATE: 6-2-92

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: May 29, 1992

CONTROL NUMBER: PD 16-92

FROM	STOCK NUMBER	NOMENCLATURE
	1376-00-628-3306	Comp B

TO	STOCK NUMBER	NOMENCLATURE
	Same	Same

SERIAL/LOT NUMBER (FROM)		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER (TO)		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG
SERIAL	LOT												SERIAL	LOT										
HOL-053-5397		A	Q-137							approx 8 high x 17/row (34 boxes)			HOL-053-5397		E	Q-137							approx 8 high x 17/row (34 boxes)	

REMARKS: Above to CC-E, rear of stacks in igloo to be rewarehoused.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☒ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

DATE OF AC

APPROVED/DATE: D. Hardman D. Hardman 5-29-92

APPROVED/DATE: William M. Wheeler 5-27-92

DA FORM 1 MAY 76 4508

RA 444 (Rev. 1/70)

RAVENNA ARSENAL, INC.

Schedule of Rewarehousing

SUBJECT: Rewarehousing

Date 5-22-92

TO: R. Holford

Charge No. _____

FROM: D. Hardman

1. As a result of Inspection performed on the item(s) listed hereon, the following work has been determined necessary to Rewarehouse rear stack(s)

WORK TO BE DONE: Rewarehouse the rear stack(s) of Lot HOL053-5397 to the front of the Igloo. Major mold and damp boxes found on the bottom 2 rows of this stack due to condensation along rear wall. Surveillance personnel are to be present at time of operation to determine repacking is necessary.

FSN	NOMENCLATURE	~~FUZE~~ MODEL	LOT NO.	QUANTITY	LOCATION
1376-00-628-3306	Composition B		HOL053-5397	approx. 8 high × 17/row	Q-137

2. It is requested that the above work be scheduled within 10 working days and this office notified prior to the actual starting of the operation.

3. Upon completion of this maintenance, it is requested that the 1st Indorsement be completed and forwarded to this office.

1st Ind. D. Hardman

TO:

Date _____

FROM:

SUBJECT:

It is advised that the work required on the above item(s) has been completed with results a follows:

_____
(Signature - Ammunition Stores)

DIST:
- Technical Manager
- Stores Manager
- Depot Operations
- Depot Planning
- Ammunition Stock Control
- Specifications
- Scheduling & Planning
- Cost & Inventory Control
- General Stores
- File - Ammunition Inspection Surveillance Division, AMC
- Production Manager
- Technical Records

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: May 29, 1992

CONTROL NUMBER: PD 15-92

FROM STOCK NUMBER	NOMENCLATURE	TO STOCK NUMBER	NOMENCLATURE
1376-00-628-3306	Comp B	Same	Same

FROM SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	TO SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG
SERIAL	LOT												SERIAL	LOT										
HOL-050-5026		E	7-E-3							10 boxes			HOL-050-5026		A	7-E-3							10 boxes	
HOL-050-5022		E	6-E-7							30 boxes			HOL-050-5022		A	6-E-7							30 "	
HOL-050-5015		E	7-E-1							1 box			HOL-050-5015		A	7-E-1							1 "	

REMARKS: Above quaxtities to CC-A, boxes have been retaped and/or restacked.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☒ RECLASSIFICATION
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ OTHER
- ☐ STOCK NUMBER CHANGE
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

DATE OF AC

APPROVED/DATE: J. Bullock J. Bullock 5-29-92

APPROVED/DATE: William Tolbert 5-29-92

DA FORM 1 MAY 76 4508

OK

RA 444 (Rev. 1/70) RAVENNA ARSENAL, INC.

Schedule of correct leaning stacks

SUBJECT: COMP B LEANING STACKS Date May 7, 1992

TO: R. HOLFORD Charge No. MA 196-9041

FROM: J. BULLOCK

1. As a result of Inspection performed on the item(s) listed hereon, the following work has been determined necessary to correct leaning stack taht allow lots to touch other lots.

WORK TO BE DONE:

FSN	NOMENCLATURE	FUZE MODEL	LOT NO.	QUANTITY	LOCATION
1376-00-628-3306	Comp B		HOL-050-5026	10 boxes	7-E-3

2. It is requested that the above work be scheduled by 6/15/92 and this office notified prior to the actual starting of the operation.

3. Upon completion of this maintenance, it is requested that the 1st Indorsement be completed and forwarded to this office. J. Bullock J Bullock 5-7-92

1st Ind.

TO: Date 5-21-92

FROM:

SUBJECT:

It is advised that the work required on the above item(s) has been completed with results as follows: Boxes Re Stacked

T C Boggs

(Signature - Ammunition Stores)

DIST: Technical Manager, Stores Manager, Depot Operations, Depot Planning, Ammunition Stock Control, Specifications, Scheduling & Planning, Cost & Inventory Control, General Stores, File - Ammunition Inspection Surveillance Division, AMC, Production Manager, Technical Records

RA 444 (Rev. 1/70) RAVENNA ARSENAL, INC.

Schedule of restack

SUBJECT: RESTACK BOXES COMP B Date May 7, 1992

TO: R. HOLFORD Charge No. M0196-9041

FROM: J. BULLOCK

1. As a result of Inspection performed on the item(s) listed hereon, the following work has been determined necessary to restack approximately 30 boxes. REAR STACK IS LEANING.

WORK TO BE DONE:

FSN	NOMENCLATURE	FUZE MODEL	LOT NO.	QUANTITY	LOCATION
1376-00-628-3306	Comp B		HOL-050-5022	30 boxes	6-E-7

2. It is requested that the above work be scheduled by June 5, 1992 and this office notified prior to the actual starting of the operation.

3. Upon completion of this maintenance, it is requested that the 1st Indorsement be completed and forwarded to this office. J. Bullock J. Bullock 5-7-92

1st Ind.

TO: Date 5-21-92

FROM:

SUBJECT:

It is advised that the work required on the above item(s) has been completed with results follows:

Boxes Re-Stacked

(Signature - Ammunition Stores)

DIST: Technical Manager
Stores Manager
Depot Operations
Depot Planning
Ammunition Stock Control
Specifications
Scheduling & Planning
Cost & Inventory Control
General Stores
File - Ammunition Inspection
Surveillance Division, AMC
Production Manager
Technical Records

01

RA 444 (Rev. 1/70) RAVENNA ARSENAL, INC.

Schedule of repair

SUBJECT: COMP B REPAIR

Date May 7, 1992

TO: R. HOLFORD

Charge No. MO 96-9041

FROM: J. BULLOCK

1. As a result of Inspection performed on the item(s) listed hereon, the following work has been determined necessary to REPAIR LOOSE FLAP ON 1 BOX

WORK TO BE DONE:

FSN	NOMENCLATURE	FUZE MODEL	LOT NO.	QUANTITY	LOCATION
1376-00-628-3306	Comp B		HOL-050-5015	60#(1 box)	7-E-1

2. It is requested that the above work be scheduled prior to shipment and this office notified prior to the actual starting of the operation.

3. Upon completion of this maintenance, it is requested that the 1st Indorsement be completed and forwarded to this office. J. Bullock J Bullock 5-7-92

1st Ind.

TO:

Date 5-21-92

FROM:

SUBJECT:

It is advised that the work required on the above item(s) has been completed with results as follows: Flaps Retaped

(Signature - Ammunition Stores)

DIST: Technical Manager
Stores Manager
Depot Operations
Depot Planning
Ammunition Stock Control
Specifications
Scheduling & Planning
Cost & Inventory Control
General Stores
File - Ammunition Inspection
Surveillance Division, AMC
Production Manager
Technical Records

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: May 7, 1992

CONTROL NUMBER: PD 14-92

STOCK NUMBER	NOMENCLATURE
1376-00-628-3306	Comp B, Grade A

TO

STOCK NUMBER	NOMENCLATURE
Same	Same

SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
SERIAL	LOT											
HOL-050-5015*		A	7-E-1							60# (1box)		
HOL-050-5022**		A	6-E-7							1800# (30 boxes)		
HOL-050-5026**		A	7-E-3							600# (10 boxes)		

SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG
SERIAL	LOT										
Same		E	Same							Same	
"		E	"							"	

REMARKS

Boxes above to CC-E
*Loose flap
**Rear stack leaning, need restacking
***Leaning stacks, correct

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☑ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

DATE OF A

APPROVED/DATE
J. Bullock J. Bullock May 7, 1992

APPROVED/DATE
W. Wheaton W. Wheaton 5-8-92

DA FORM 1 MAY 76 4508

RA 444 (Rev. 1/70) RAVENNA ARSENAL, INC.

Schedule of _____

SUBJECT: LOT SEPERATION Date 5/4/92

TO: R. ROLFORD Charge No. 196-9041

FROM: J BULLOCK

1. As a result of Inspection performed on the item(s) listed hereon, the following work has been determined necessary to _____

WORK TO BE DONE: CORRECT LEANING STACK THAT ALLOW LOTS TO TOUCH OTHER LOTS

FSN	NOMENCLATURE	FUZE MODEL	LOT NO.	QUANTITY	LOCATION
1376-00-628 3306	COMP B		HOL050-5026	10 boxes	7E3

2. It is requested that the above work be scheduled BY JUNE 15 and this office notified pnior to the actual starting of the operation.

3. Upon completion of this maintenance, it is requested that the 1st Indorsement be completed and forwarded to this office.

1st Ind. _____

TO: Date _____

FROM:

SUBJECT:

It is advised that the work required on the above item(s) has been completed with results s follows:

_____
(Signature - Ammunition Stores)

DIST:
- Technical Manager
- Stores Manager
- Depot Operations
- Depot Planning
- Ammunition Stock Control
- Specifications
- Scheduling & Planning
- Cost & Inventory Control
- General Stores
- File - Ammunition Inspection Surveillance Division, AMC
- Production Manager
- Technical Records

RA 444 (Rev. 1/70) RAVENNA ARSENAL, INC. 92-15

Schedule of _____

SUBJECT: RESTACK LEANING STACKS 30 BOXES Date 5/4/92

TO: R. HOLFORD Charge No. 196-9041

FROM: J BULLOCK

1. As a result of Inspection performed on the item(s) listed hereon, the following work has been determined necessary to _____

WORK TO BE DONE: RESTACK APPROX 30 BOXES. REAR STACK IS LEANING

FSN	NOMENCLATURE	FUZE MODEL	LOT NO.	QUANTITY	LOCATION
1376 00 628 3306	COMP B		HOL 050.5022	30 boxes	6E7

2. It is requested that the above work be scheduled by June 5 1992 and this office notified pnior to the actual starting of the operation.

3. Upon completion of this maintenance, it is requested that the 1st Indorsement be completed and forwarded to this office.

1st Ind. _____

TO: Date _____

FROM:

SUBJECT:

It is advised that the work required on the above item(s) has been completed with results follows:

_____
(Signature - Ammunition Stores)

DIST: Technical Manager
Stores Manager
Depot Operations
Depot Planning
Ammunition Stock Control
Specifications
Scheduling & Planning
Cost & Inventory Control
General Stores
File - Ammunition Inspection
Surveillance Division, AMC
Production Manager
Technical Records

RA 444 (Rev. 1/70) RAVENNA ARSENAL, INC.

Schedule of _____

SUBJECT: REPAIR LOOSE FLAP ON BOX Date 5/1/92

TO: R HOLFORD Charge No. 196-9041

FROM: J BULLOCK

1. As a result of Inspection performed on the item(s) listed hereon, the following work has been determined necessary to REPAIR LOOSE FLAP ON 1 BOX

WORK TO BE DONE:

FSN	NOMENCLATURE	FUZE MODEL	LOT NO.	QUANTITY	LOCATION
1376-00-628 3306	COMP B	HOL 050	5015	60 #	7ET

2. It is requested that the above work be scheduled PRIOR TO SHIPMENT and this office notified prior to the actual starting of the operation.

3. Upon completion of this maintenance, it is requested that the 1st Indorsement be completed and forwarded to this office.

1st Ind. _____

TO: Date _____

FROM:

SUBJECT:

It is advised that the work required on the above item(s) has been completed with results follows:

_____
(Signature - Ammunition Stores)

DIST: Technical Manager
Stores Manager
Depot Operations
Depot Planning
Ammunition Stock Control
Specifications
Scheduling & Planning
Cost & Inventory Control
General Stores
File - Ammunition Inspection
Surveillance Division, AMC
Production Manager
Technical Records

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: May 7, 1992

CONTROL NUMBER: PD 13-92

STOCK NUMBER	NOMENCLATURE
1376-00-628-3306	Comp B, Grade A

TO

STOCK NUMBER	NOMENCLATURE
Same	Same

SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
SERIAL	LOT											
HOL-35-9119		E	1-E-3							60#(1 box)		
HOL-050-5004		E	2-E-4							120#(2 boxes)		
HOL-050-5034		E	3-E-9							120#(2 boxes)		

SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG
SERIAL	LOT										
Same		A	Same							Same	
Same		A	Same							Same	
Same		A	Same							Same	

REMARKS

Boxes above to CC-A, boxes have been repacked and relabeled.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☑ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

DATE OF A

APPROVED/DATE: J. Bullock 5-7-92

APPROVED/DATE: W. Wheaton 5-8-92

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: April 24, 1992

CONTROL NUMBER: PD 12-92

FROM: STOCK NUMBER	NOMENCLATURE
1376-00-628-3306	Comp B

TO: STOCK NUMBER	NOMENCLATURE
Same	Same

FROM: SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
SERIAL	LOT											
	HOL-050-5004	A	2-E-4							2 boxes		
	HOL-050-5034	A	3-E-9							2 boxes		
	HOL-050-5062	A	4-E-2							8 boxes		
	HOL-050-5069	A	4-E-8							3 boxes		

TO: SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
SERIAL	LOT											
Same		E	Same							Same		
Same		E	Same							Same		
Same		E	Same							Same		
Same		E	Same							Same		

REMARKS: Boxes to CC-E, water damage, tattered labels, holes in tops, to be repacked

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☒ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

DATE OF ACTION

APPROVED/DATE: J. Bullock J. Bullock 4-24-92

APPROVED/DATE: [signature] 4-28-92

FORM MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: May 7, 1992

CONTROL NUMBER: PD 12-92

STOCK NUMBER	NOMENCLATURE
1376-00-628-3306	Comp B, Grade A

TO	STOCK NUMBER	NOMENCLATURE

SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG
SERIAL	LOT												SERIAL	LOT										
HOL-35-9120		A	1-E-5							10 boxes & all others needed to make proper shipping configuration			Same		E	Same							Same	

REMARKS

Boxes above to CC-E, to be re-labeled, magazine inspection revealed that mice have chewed the front labels from boxes on the bottom row.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☑ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

DATE OF AC

APPROVED/DATE: J. Bullock J Bullock 5-7-92

APPROVED/DATE: W. Wheaton 5-8-92

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 4-24-92

CONTROL NUMBER: 8D 11-92

CK NUMBER	NOMENCLATURE	TO	STOCK NUMBER	NOMENCLATURE
1376-00-628-3306	Comp B		Comp B	Comp B

SERIAL/LOT NUMBER (L / LOT)	COND	SITE LOCATION	GRID LOCATION	RESSITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER (SERIAL / LOT)	COND	SITE LOCATION	GRID LOCATION	RESSITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
HOL-053-165	A	M-87							Several rear stack			Same	E	M-87							Several rear stack		
HOL-053-226	A	M-87							Same			Same	E	M-87							Same		

KS
Several boxes of above lots at the bottom row(s) of the rear stacks(s) to CC-E, seeping water from rear vent.

TYPE OF ACTION

- [ ] LOCATION CHANGE
- [ ] SERIAL/LOT NUMBER CHANGE
- [ ] STOCK NUMBER CHANGE
- [x] RECLASSIFICATION
- [ ] OTHER
- [ ] ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

DATE OF ACTION

APPROVED/DATE
Dr. Hardman [signature] 4-24-92

APPROVED/DATE
[signature] 4-28-92

FORM MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: April 24, 1992

CONTROL NUMBER: PD 10-92

CK NUMBER	NOMENCLATURE		STOCK NUMBER	NOMENCLATURE
1376-00-628-3306	Comp B	TO	Same	Same

SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RESIDUE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RESIDUE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
-	LOT												SERIAL	LOT											
HOL-053-57		A	M-93							60# net			Same		E	Same							Same		

S 60# to CC-E, required new box top and new liner.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☒ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

DATE OF ACTION

APPROVED/DATE: D. Hardman D. Hardman 4-24-92

APPROVED/DATE: [signature] 4-28-92

ORM
JAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: April 23, 1092

CONTROL NUMBER: PD 8-92

CK NUMBER	NOMENCLATURE	TO STOCK NUMBER	NOMENCLATURE
1376-00-628-3306	Comp B	Same	Same

ERIAL/LOT NUMBER L	LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER SERIAL	LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
	HOL-050-5060	A	4-E-2							3 boxes			Same		E	Same							Same		

KS 3 boxes to CC-E, to be repacked and relabeled.

TYPE OF ACTION

- [ ] LOCATION CHANGE
- [ ] SERIAL/LOT NUMBER CHANGE
- [ ] STOCK NUMBER CHANGE
- [x] RECLASSIFICATION
- [ ] OTHER
- [ ] ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

DATE OF ACTION

APPROVED/DATE: J. Bullock J Bullock 4-23-92

APPROVED/DATE: [signature] 4-28-92

ORM MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: April 14, 1992

CONTROL NUMBER: PD 7-92

CK NUMBER	NOMENCLATURE	TO	STOCK NUMBER	NOMENCLATURE
1376-00-628-3306	Comp B		Same	Same

ERIAL/LOT NUMBER L	LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER SERIAL	LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
HOL-050-5076		A		2-E-1						60#					E	Same							Same		
HOL-050-5077		A		2-E-1						60#					E	Same							Same		

KS: 60# each lot to CC-E, boxes have holes in corner of each box, to be repacked before shipment.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☒ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

DATE OF ACTION

APPROVED/DATE: J. Bullock J Bullock 4-14-92

APPROVED/DATE: [signature] 4-23-92

FORM MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: April 14, 1992

CONTROL NUMBER: PD-6-92

STOCK NUMBER	NOMENCLATURE
1376-01-055-0998	Propellant WC 844 f/5.56MM M193

TO

STOCK NUMBER	NOMENCLATURE
Same	Same

SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RESSITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RESSITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG
SERIAL	LOT												SERIAL	LOT										
OMF87C-049302		D	BC 415							all			Same		A	Same							Same	
OMF87D-049310		D	BB 409							all			Same		A	Same							Same	
OMF87E-049313		D	BA 403							all			Same		A	Same							Same	

REMARKS: All lots to CC-A, reassessment completed and lots met all requirements of MIL-P-3984H, Reference: SMCLC-BS (702-4d) 16 October 1991, memorandum for Commander, AMCCOM Subject: Reassessment of WC-844 propellant, lots 49302, 49310 & 49313.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☑ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

DATE O

APPROVED/DATE: J. Bullock J. Bullock 4-14-92

APPROVED/DATE: W. Wheaton W. Wheaton 4-16-92

FORM 1 MAY 76 4508

Mr Kemper/nw/7181

SMCLC-BS (702-4d)

16 October 1991

MEMORANDUM FOR Commander, U.S. Army Armament, Munitions and Chemical Command, ATTN: AMSMC-QAM-A (Ms. Sue Menaley), Rock Island, IL 61299-6000

SUBJECT: Reassessment of WC-844 Propellant, Lots 49302, 49310, and 49313

1. Reference AMSMC-QAM-A Ballistic Test Report 58-90, 12 July 1990.

2. Subject lots met all requirements of MIL-P-3984H.

3. Complete test data is enclosed.

4. The POC is Mr. Fred Kemper, SMCLC-BS, DSN 403-9181.

FOR THE COMMANDER:

ORIGINAL SIGNED BY

Encl

CLAIR HOLMES
Chief, Ballistic Services

DEPARTMENT OF THE ARMY
HEADQUARTERS U.S. ARMY ARMAMENT, MUNITIONS AND CHEMICAL COMMAND
ROCK ISLAND, ILLINOIS 61299-6000

REPLY TO
ATTENTION OF

FAX NUMBER: COM (309) 782-3056
FAX NUMBER DSN 793-~~[illegible]~~ 3056

FACSIMILE TRANSMITTAL HEADER

NAME: [illegible]
LOCATION: Ravenna AAP
OFFICE SYMBOL: _____
PHONE: 3[illegible]

FROM
NAME: [illegible]
LOCATION: HQAMCCOM
OFFICE SYMBOL: _____
PHONE: _____

********** TOTAL PAGES 2 INCLUDING THIS PAGE **********

REMARKS:

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: March 14, 1992

CONTROL NUMBER: PD-5-92

STOCK NUMBER	NOMENCLATURE
1376-00-628-3306	Comp B, Grade A

TO

STOCK NUMBER	NOMENCLATURE
Same	Same

SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
SERIAL	LOT											
HOL-053-231		E	5-C-7							4 boxes		

SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG
SERIAL	LOT										
Same		A	Same								

REMARKS: 4 boxes to CC-A, repacked 4-13-92, reference 1st indorsement on RA-444 (Schedule of Repack) March 30, 1992 L. Boggs (lids replaced).

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☑ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

DATE OF

APPROVED/DATE: J. Bullock 4-14-92

APPROVED/DATE: W. Wheaton 4-16-92

FORM 1 MAY 76 4508

Sherry - Please handle thanks - Ray 3/30 Advise when Comp

RA 444 (Rev. 1/70) RAVENNA ARSENAL, INC.

Schedule of repack

SUBJECT: REPACK COMP B

Date March 30, 1992

TO: R. HOLFORD

Charge No. no 196-904

FROM: J. BULLOCK

1. As a result of Inspection performed on the item(s) listed hereon, the following work has been determined necessary to repack 3 boxes oc Comp B.

WORK TO BE DONE:

Repack 3 boxes of Comp B that have been infested with the white marked spider beetle - should be done before infestation spreads.

FSN	NOMENCLATURE	FUZE MODEL	LOT NO.	QUANTITY	LOCATION
1376-00-629-3306	Comp B, Grade A		HOL-053-231	3 boxes	5-C-7

2. It is requested that the above work be scheduled and completed by April 10, 1092 and this office notified pnior to the actual starting of the operation.

3. Upon completion of this maintenance, it is requested that the 1st Indorsement be completed and forwarded to this office.

J. Bullock J Bullock

RECEIVED

MAR 30 1992

STORES, TRANSPORTATION AND OPERATIONS

1st Ind.

TO: J. Bullock

Date 4-14-92

FROM: S. A. Gardner

SUBJECT: Lid replacement

It is advised that the work required on the above item(s) has been completed with results a follows: Lids were replaced.

S. A. Gardner

(Signature - Ammunition Stores)

DIST:
- Technical Manager
- Stores Manager
- Depot Operations
- Depot Planning
- Ammunition Stock Control
- Specifications
- Scheduling & Planning
- Cost & Inventory Control
- General Stores
- File - Ammunition Inspection Surveillance Division, AMC
- Production Manager
- Technical Records

TRAILER/CAR 4-13-92

MATERIEL

SHIPPED RECEIVED

BUILDING	LOT NUMBER	STOCK NUMBER	NO. ROUNDS
5-C-7	HAC 053-231	1376-00-628-3306	4 BXS
	NEW LIDS DUE TO BEETLE DAMAGE		

CHECKER

RA 444 (Rev. 1/70) RAVENNA ARSENAL, INC.

Schedule of repack

SUBJECT: REPACK COMP B

Date March 30, 1992

TO: ~~R. HOEFORD~~

Charge No. no 192-9041

FROM: J. BULLOCK

1. As a result of Inspection performed on the item(s) listed hereon, the following work has been determined necessary to repack 3 boxes oc Comp B.

WORK TO BE DONE: 4 4-13-92

Repack ~~3~~ 4 boxes of Comp B that have been infested with the white marked spider beetle - should be done before infestation spreads.

FSN	NOMENCLATURE	FUZE MODEL	LOT NO.	QUANTITY	LOCATION
1376-00-629-3306	Comp B, Grade A		HOL-053-231	3 boxes	5-C-7

2. It is requested that the above work be scheduled ~~and completed~~ by April 10, 1992 and this office notified prior to the actual starting of the operation.

3. Upon completion of this maintenance, it is requested that the 1st Indorsement be completed and forwarded to this office.

J. Bullock

1st Ind.

RECEIVED

MAR 30 1992

TO:

Date 4-13-92

FROM: STORES, TRANSPORTATION AND OPERATIONS

4 Boxes

SUBJECT:

It is advised that the work required on the above item(s) has been completed with results follows: Repacked 4/13/92

(Signature - Ammunition Stores)

DIST:
- Technical Manager
- Stores Manager
- Depot Operations
- Depot Planning
- Ammunition Stock Control
- Specifications
- Scheduling & Planning
- Cost & Inventory Control
- General Stores
- File - Ammunition Inspection Surveillance Division, AMC
- Production Manager
- Technical Records

AMMUNITION TRANSFER RECORD
(AMCR 746-25)

DATE PREPARED: March 30, 1992

CONTROL NUMBER: PD-4-92

FROM STOCK NUMBER	NOMENCLATURE
1376-00-629-3306	Comp B

TO STOCK NUMBER	NOMENCLATURE
Same	Same

FROM SERIAL/LOT NUMBER: SERIAL	FROM SERIAL/LOT NUMBER: LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	TO SERIAL/LOT NUMBER: SERIAL	TO SERIAL/LOT NUMBER: LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG
HOL-053-231		A	5-C-7							3 boxes			Same		E	Same							Same	

REMARKS: 3 boxes to CC E until repacked, boxes infested with spider beetle.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☑ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

DATE OF

APPROVED/DATE: J. Bullock 3-30-92

APPROVED/DATE: W. Wheaton 3.31-92

FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: March 23, 1992

CONTROL NUMBER: PD-3-92

STOCK NUMBER	NOMENCLATURE
1376-00-628-3306	Composition B

TO: Same / Same

SERIAL/LOT NUMBER: SERIAL	LOT	COND	SITE LOCATION	GRID LOCATION	RESIDUE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
HOL-35-9119		A	1-E-3							60#(1 box)		

SERIAL/LOT NUMBER: SERIAL	LOT	COND	SITE LOCATION	GRID LOCATION	RESIDUE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG
Same		E	Same							Same	

REMARKS: 1 box (60#) to CC-E unserv(limited restroration), to be repacked.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☐ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

DATE O

APPROVED/DATE: J. Bullock 3-23-92

APPROVED/DATE: W. Wheaton 3-26-92

FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 3-20-92

CONTROL NUMBER: PD-2-92

STOCK NUMBER	NOMENCLATURE
1376-01-132-1692	Propellant WC 814 for 5.56MM Cal Blank Ctg

TO	STOCK NUMBER	NOMENCLATURE
	Same	Same

SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
SERIAL	LOT											
TZC88J-049466		D	AC-165							93,673		

SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG
SERIAL	LOT										
Same		A	Same							Same	

MARKS: Lot to CC-A, Lots stored in metal or metal lined wood containers(level A) are valid for 5 years, Reference SB 742-1300-94-2, Page 4, Para. b, Propellant Reassessment Program (PRP), Para. (3) (a).

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☒ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

DATE OF

APPROVED/DATE: D. Hardman 3-20-92

APPROVED/DATE: W. Wheaton 3-20-92

FORM 4508 1 MAY 76

b. Propellant Reassessment Program (PRP). This program involves the test and evaluation of stored propellant to determine functional serviceability prior to loading into a major end item. Specifically excluded from this program are separate loading propelling charges whose functional serviceability is evaluated through the Large Caliber Test Program, which is managed by AMCCOM, DRSMC-QAS(R). AMCCOM-Rock Island is responsible for assessing the functional serviceability of bulk propellant and component charges under the PRP to provide loading authorization. Functional serviceability will be determined by the results of either a laboratory reassessment test or a laboratory/ballistic test combination. The procedures and requirements stated herein for reassessment/ballistic testing are mandatory for all field service stocks by direction of DRSMC-QAS(R). Industrial stocks will be tested by direction of DRSMC-PD(R). Sample selection and shipment will be in accordance with appendix unless otherwise directed.

(1) Laboratory reassessment test will be performed when an actual need for the propellant exists. Request for reassessment testing of field service stocks will be submitted to AMCCOM, DRSMC-QAS(R) and will include the following information:

(*a*) NSN, lot number, and quantity of materiel to be reworked.

(*b*) Detailed scope of rework to be accomplished and DMWR.

(*c*) Estimated start date of operation.

(*d*) Lot number and NSN of propellant/propelling charge requiring reassessment.

(2) Ballistic testing at a proving ground will be performed as required by direction of AMCCOM-Rock Island.

(3) Loading authorization will be provided for lots which meet the requirements of the PRP, and will be annotated on ARRCOM Form 210-R (Propellant Acceptance Sheet) which will be prepared by AMCCOM-Rock Island. Loading authorizations are issued at time of initial acceptance or reacceptance for a specific time period as follows:

(*a*) Lots stored in metal or metal/plywood containers (level A) are valid for 5 years.

(*b*) Lots stored in fiber drums are valid for 2 years.

(*c*) Propellant compositions M5, M10, M26 and M26E1 are valid for 2 years regardless of pack.

(4) The expiration date of loading authorization will be annotated on the Depot Surveillance Record (DSR) cards at time of each shipment or on shipping documents if DSR card does not accompany materiel shipped. A copy of the ARRCOM Form 210-R will be forwarded to the quality assurance (QA) element at the receiving installation.

(5) A propellant lot may only be loaded into those items listed on the ARRCOM Form 210-R. Any deviation must be requested through DRSMC-QAS(R).

(6) Copies of ARRCOM Forms 210-R may be obtained from DRSMC-QAS(R) upon request.

8. Use Limitations. Advance planning, to determine when bulk propellant or component charges may be required, is essential to assure sufficient lead time to permit accomplishment of test. Storage and production activities must assure that loading authorization is current prior to use or issue for use. All OCONUS shipment of bulk propellant or component charges must be cleared through AMCCOM, DRSMC-QAS(R) prior to release of shipment. When the loading authorization as listed on the ARRCOM Form 210-R has expired, the lot will be placed in Condition Code D. Normal cyclic inspection will continue in accordance with SB 742-1 and this bulletin; renewal of loading authorization within the provisions of the PRP will not be requested until a known requirement for the lot exists.

9. Special Purpose Materiel. Propellant classified as Master or Reference lots are exempt from the PRP requirements in this bulletin.

10. Distribution of DA Form 984. All Propellant samples forwarded to a test installation will be accompanied by a DA Form 984, Munitions Surveillance Report, with Part 1 completed in accordance with SB 742-1. Distribution of DA Form 984 will be as follows:

Original: Mail to test installation.

Copy: Mail to Commander, AMCCOM, ATTN: DRSMC-QAS(R), Rock Island, IL 61299-6000

Copy: Place in waterproof envelop and affix to outside of box containing sample(s). When separate loading propelling charges are submitted, an alternate method is to place the copy inside the propelling charge container directly behind the lid.

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 2-14-92

CONTROL NUMBER: PD-1-92

STOCK NUMBER	NOMENCLATURE	TO	STOCK NUMBER	NOMENCLATURE
1376-01-049-1448	Propellant, WC 846 Tracer		Same	Same

SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG
SERIAL	LOT												SERIAL	LOT										
DMF89E-049516		A	SM-5							600			Same		D	Same							Same	

MARKS: Lot to CC-D; Reference SB 742-1300-94-2, Page 4, Para. B, PRP, Para. (3) (b), Para. 8, no load authorization

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☑ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR

DATE OF

APPROVED/DATE: D. Hardman 2-14-92

APPROVED/DATE: W. Wheaton

FORM 4508
1 MAY 76

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 13 May 1996

CONTROL NUMBER: 96-002

FROM	STOCK NUMBER	NOMENCLATURE
	1376-00-628-3306	Composition B Grade A

TO	STOCK NUMBER	NOMENCLATURE
	1376-00-628-3306	Composition B Grade A

SERIAL/LOT NUMBER (FROM)		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER (TO)		COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
SERIAL	LOT												SERIAL	LOT											
HOL 053-165	1	E	3B3							60 Lbs	1		HOL 053-165		A	3B3							60 lbs	1	

REMARKS

1 box of Comp B was placed in CCE 10/15/93 (PD1-93). The pack,s top was replaced and the pack in now back in CCE.

TYPE OF ACTION

- ☐ LOCATION CHANGE
- ☐ SERIAL/LOT NUMBER CHANGE
- ☐ STOCK NUMBER CHANGE
- ☒ RECLASSIFICATION
- ☐ OTHER
- ☐ ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR: James H Bullock — DATE OF ACTION: 4/29/96

APPROVED/DATE: Karl A Urban — 05/13/96

DA FORM 1 MAY 76 4508

AMMUNITION TRANSFER RECORD
(AMCR 740-25)

DATE PREPARED: 27 Feb. 1996

CONTROL NUMBER: PD 96-001

FROM STOCK NUMBER	NOMENCLATURE	TO STOCK NUMBER	NOMENCLATURE
9 1376-00-628-3306	Comp B	1376-00-628-3306	Comp B

SERIAL/LOT NUMBER SERIAL	LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY	SERIAL/LOT NUMBER SERIAL	LOT	COND	SITE LOCATION	GRID LOCATION	RES SITE	T/S	L/C	METH	MGR	QUANTITY	NO. PKG	UP QTY
HOL lb	35-9126	A	1E5							60 lbs	1		HOL	35-9126	H	HG359							60	1	

REMARKS

During loading for shipment box was found to have been damaged by Mice. Mice chewed through the box top and liner. Contents contaminated by cardboard, paper and mice bait.

TYPE OF ACTION

- [X] LOCATION CHANGE
- [ ] SERIAL/LOT NUMBER CHANGE
- [ ] STOCK NUMBER CHANGE
- [X] RECLASSIFICATION
- [ ] OTHER
- [ ] ITEM DATA CHANGE

SIGNATURE OF FOREMAN/CHECKER/INSPECTOR: J Bullock — DATE OF ACTION: 2/27/96

APPROVED/DATE: Karl A Yrbon — 2/27/96

APPROVED/DATE:

DA FORM 1 MAY 76 4508

SECTION 7:

RAVENNA ORDNANCE PLANT (ROP) MANUAL OF SAFE PRACTICES (ROP 866-15M-1-13, ORD -463

R.O.P.-866—15M—1-42

MANUAL OF SAFE PRACTICES

RAVENNA ORDNANCE PLANT

ATLAS POWDER COMPANY
(Operating Contractor)
RAVENNA, OHIO

W-ORD-463

MANUAL
OF
SAFE PRACTICES

RAVENNA
ORDNANCE
PLANT

ATLAS POWDER COMPANY
(Operating Contractor)
RAVENNA, OHIO

W-ORD-463

TABLE OF CONTENTS

THIS BOOK IS CODED FOR YOUR CONVENIENCE

WHITE—General rules for all employes.

GREEN—Rules for Office, Laboratory, and Non-Mechanical service employes.

YELLOW—Mechanical employes.

PINK—Railroad employes.

BLUE—Explosive employes.

INTRODUCTORY EXPLANATION

This plant is government property and is being operated by the Atlas Powder Company for the U. S. government. It is a major part of the program for National Defense and its continuous operation is imperative. Every means will be used to insure regular operation, to safeguard the personnel and the Plant property.

The Company believes in maintaining good working conditions. The advantages of a safe, comfortable, and well-lighted working place are recognized; and every reasonable effort will be made to provide this environment.

The Company strives to prevent accidents by fostering a thorough safety program, including systematic inspections, proper instructions regarding safe practices and the providing of adequate protection and equipment for the elimination of accidents, hazards, and fire.

IT TAKES COOPERATION!

Our Safety is accomplished by a sincere and constant cooperative spirit among our employes. We have found in our experience that merely to talk Safety does not make Safety a fact.

Each and everyone of us must perform our daily tasks for Safety in the same manner that we perform the tasks of our mechanical work. Then, and then, only, will Safety be a reality during our working day.

PURPOSE

This Manual has been designed as a reference to assist you in complying with the needs of this plant for Safety.

EMPLOYES

All persons when employed are advised that certain portions of the occupations are hazardous, that their safety as well as that of others depends on the intelligence and care exercised by themselves and by their fellow workers.

The Company maintains a regular Medical Department and Hospital to safeguard the health and well-being of its employes. In addition to the regular examination given at the time of hiring, periodic examinations are given thereafter. These examinations are of much value in helping to determine the kind of work for which the employe is best fitted, preserving his general health and detecting those conditions which can be corrected by early treatment and which would be serious if neglected.

Employes are expected to report for work on time and to be regular in attendance. If you expect to be absent, notify your Foreman in advance. If you are unable to come in due to sickness or other reasons, notify the Telephone Operator immediately. Any employe absent for three consecutive days without notice will be subject to dismissal pending investigation of cause of absence. If you are obliged to be absent for over fourteen consecutive days, it is necessary to get a written Leave of Absence to prevent being dropped from the Roll and breaking your service record.

No employe of the Arsenal will be allowed to leave his or her work for the purpose of making personal telephone calls without first obtaining permission from his or her immediate supervisor or foreman. Such permission will be given in emergency cases only.

Because of the part this Plant plays in the National Defense Program, every employe should be fully aware of his personal responsibility to guard against espionage or sabotage activity. Therefore, each employe should be careful of his conversation at all times and should not divulge any information concerning the activities of the personnel of the Plant or its operation. Company activities should not be discussed with or in the presence of outsiders. Do not talk about the Arsenal outside the plant. Do not talk about your area with employes from another area.

Employes are allowed in the plant at such times and in such buildings, as their duties require. Employes will not leave their department nor go to areas or departments other than the one in which they are employed unless authorized by written permission signed by Supervisor.

The photographic pass is given to each employe to be used for identification when entering or leaving the Plant and in getting pay from the Payroll Department. Each employe is held strictly accountable for the personal pass issued to him and its wrongful use is a serious offense. If lost, report immediately to your Supervisor, telephoning from the gate if outside the Arsenal. If inside, report verbally.

Employes are given photographic badges for the area in which they are to work. Before entering other areas proper authority must be obtained.

No person, unless authorized, will be permitted to enter, or remain in any magazine or explosive area. Guards, foremen, and others in charge of explosives and ammunition will establish the identity of all person who approach magazines, buildings or areas in their charge, and determine the right of such person to enter or remain therein. They will request any such person to leave, or eject him if his presence or actions are contrary to safety.

Identification badges must be displayed on the upper left portion of each employe's person and must be readily visible for inspection at any time.

When passing through any gate personnel must have passes ready for immediate inspection by the guard.

No packages or material may be taken from the plant without a special package pass. All

Patrolmen have authority to inspect any and all packages entering or leaving the Plant at any time.

It is necessary from time to time to search employes on Plant property. Please understand that this is being done for your protection and the protection of your fellow workers. Searches of this nature do not have their basis in suspicion of a dishonest act, but are necessary to insure that no matches, lighters, or similar devices are carried into the Plant.

Suggestions from employes on matters concerning safety, more efficient operation, better practices, etc., are welcome at all times and will be given careful consideration.

Foremen and Supervisors at this Plant are not interested merely in getting out production. They will be glad at all times to discuss your problems, to explain things you do not understand, and to help you to learn your job, to get advancement, and to work safely. They should be consulted with any complaint that you may have.

In the study of employes for advancement, due consideration will be given to the manner in which they comply with the rules of this safety manual.

GENERAL RULES

Certain rules are necessary for the successful operation of any business. Much thought has been given to the following rules, and the careful reading of them will suggest the reason for each:

1. It is a serious offense for an employe to hire in under an assumed name or falsify or leave out any part of his employment application.
2. No fighting is permitted on this Plant.
3. Drugs, firearms, or cameras are not permitted on the Plant except by special permission.
4. Lighters and matches are strictly forbidden on the Plant operating area. An employe found with matches or a lighter will be subject to discharge depending upon the seriousness of the offense—the first time he will be warned and the second time discharged. Any employe found with intentionally concealed matches will be dismissed for the first offense.
5. Smoking is not permitted in the Plant operating areas.
6. Divulging information concerning the Plant or its operation is a serious offense.
7. No employe is permitted to enter the Plant with intoxicants on his breath or have any intoxicating liquor in his possession within the Plant.
8. Gambling in any form within the Plant is strictly forbidden.
9. Gross neglect or violation of safety rules and regulations will be subject to strong disciplinary action.
10. A clean Plant is a safe Plant. All good craftsmen should clean up their own jobs before leaving the location.
11. Keep aisles clear, and access to exits must never be blocked.

12. Stack materials in an orderly and safe manner.
13. Clean up spilled oil.
14. Put trash and other waste materials in proper receptacles and do not allow to accumulate.
15. Learn the rules posted for your house or shop. Follow them and instructions given by your Foreman to the letter.
16. If your work takes you into other buildings, as in the case of repairmen, read the house rules before proceeding.
17. Never experiment. If you are not sure, ask and find out the correct method.
18. All work on hazardous material will be suspended during an electrical storm when ordered by the Operating Superintendent, and employes will withdraw from the immediate vicinity where explosives and ammunition are stored to designated buildings.
19. Employes will thoroughly acquaint themselves with the safety exits of the building in which they are employed, the location of bombproofs, which are to be used in case of an emergency.
20. Daily, on beginning work, employes should satisfy themselves as to the condition of safety exits, fire-fighting apparatus, and machinery under their charge. Any unsafe conditions noted should be promptly reported to the foreman or other responsible official.
21. Employes are expected to satisfy themselves at all times that the posters in the room or building relating maximum weight of hazardous materials allowed, are adhered to; that the tools permitted on the posted list are in their place or accounted for. Instances of disregard of such requirements should be promptly recorded.
22. Employes will not make changes in, or tamper with electrical equipment. All repairs and changes will be made by the persons authorized to do this work.

23. Employes will not remove any guards, railings, ladders, protectors, or safety appliances of any kind, except for repairs or cleaning. Machines from which any safety appliance has been removed will not be operated until the appliance has been replaced.
24. Paints, oils, etc., unnecessary to operation shall not be allowed to remain in explosive operating buildings or magazines. A special storeroom is provided for inflammable materials, and only the quantity required for immediate use should be removed from the store-house.

SAFETY RULES FOR OFFICE WORKERS

A detailed analysis of accident possibility indicates very clearly that office workers and service employes are exposed to many hazards and that to avoid personal injury they must exercise reasonable care and good judgment in the performance of their daily work—just as do the men in the field.

1. A desk or cabinet drawer or packages left open are a very serious collision and tripping hazard. Keep them closed and out of the way. Don't pinch your fingers while closing them.
2. Tilting a chair back in order to get in a more comfortable position is a widespread practice and a bad one. Many people have been injured due to chairs slipping out from under them or breaking due to the added strain that such a position places upon a chair. Don't do it.
3. The use of pins to fasten papers together has been the cause of many scratched and pricked fingers. Pins, therefore, are not to be used for this purpose. All other fasteners should be handled carefully.
4. Fingers may be cut when handling any paper. Avoid this by being careful.
5. Any person who receives a cut, scratch, bruise (including blood and water blisters), sprain, strain or any other form of injury, no matter how slight and regardless of whether or not the skin may be broken, must report immediately to the first aid station for treatment. First aid supplies must not be kept in the offices.
6. Pencils, pen points, scissors, etc., should be carried in such a manner that the sharp points cannot cause puncture wounds to their owners or others. Carry them point

down in pocket, when not in use, and not between fingers with point in palm of hand.

7. Defective chairs and desks or any other equipment are hazardous and may result in injuries. Don't keep such equipment in service. Report it at once to your supervisor.
8. Cords on electrically operated office machines may cause people to trip and fall if left on the floor or across passageways. Inspect before short circuits occur, not after.
9. Many persons have received black eyes from walking into partly open doors. Keep them closed or opened all the way back against the wall in order to avoid this danger.
10. Good housekeeping is the keynote of safety as well as efficient workmanship. Keep your desk clean and orderly.
11. No horseplay. Don't shoot paper clips and wads of paper with rubber bands, etc., or engage in any of the practices that may come within this term.
12. A standard four-drawer correspondence file can be very dangerous as it may upset when the top drawer is opened if the top drawer happens to be heavily loaded and the lower drawers are empty or filled with lightweight materials. Use care in loading file and stand on side when opening.
13. Electric fans can inflict serious hand injuries. Keep them off desks and have them located high enough above the floor to be out of reach.
14. Don't walk headlong or too hurriedly from rooms into corridors, especially poorly lighted ones. When walking in corridors, keep to the right, particularly at corners.
15. Don't drive nails in walls to hang file boards and other articles—use hooks or other suitable devices. See Safety Division if in doubt.

16. KEEP STOREROOMS AND REST ROOMS CLEAN AND ORDERLY.
17. Don't store combustible material closer than 6 inches to any steam pipe or radiator.
18. Don't heat stoppered bottles by placing them on radiators or steam pipes. They may get too hot and explode with serious results from flying glass.
19. Take time to be safe when using stairways. NEVER RUN ON STAIRS.
20. Don't place articles on window sills, filing cabinets, etc., which may cause injury if they fall.
21. Be careful to keep hands free when raising or lowering windows, also when closing doors and gates.
22. Knives and blades should never be placed in desk drawers with blade open. Don't use makeshift tools.
23. Beware of hernia, sprains, strains and splinters from lifting or shifting equipment and supplies.
24. Never deposit oily cloths, glass, or blades in waste baskets.
25. When out on the plant observe the rule which specifies the left hand side of the road for pedestrians. Look both ways before crossing roads or stepping onto the road from behind a parked car or a blind corner. When you walk avoid ankle spraining objects.
26. When operating a motor vehicle, drive with care and watch for pedestrians and railroad crossings. The trains have the right of way. "Don't speed."
27. Familiarize yourself with all regulations in the "Manual of Safe Practices" which may now or at some future time apply to you, depending on what you do or where you go.
28. Look out for broken bottles, porcelain faucet handles, slippery, soapy, waxy or icy floors or walkways, and tripping door mats.

29. If you have smoking privileges, be careful.
30. Keep an eye on sanitation.
31. Crowding on stairs or entrance doorway is dangerous.
32. Walking without looking where you are going, climbing on chairs, boxes, or other makeshift supports should not be done.

SAFETY RULES FOR GUARDS, FIREMEN AND SERVICE EMPLOYES

(Non-Mechanical)

1. The nature of your work (PROTECTION) makes you a logical person to assist in the enforcement of all safety rules when you can.

   You are authorized to caution with discretion anyone on the plant whom you know to be breaking any rule, whether it be strictly safety or deportment.
2. Although you may be called on for emergency service from time to time, do not expose yourself uselessly. For example, use reasonable care:
   a. When getting on or off fire truck or other vehicles.
   b. Directing Plant traffic or parking.
   c. Accosting suspects.
   d. When making night rounds, have sufficient light.
   e. During winter, when roads and paths are slippery.
3. Keep yourself adequately protected from the elements in all weather.
4. Keep safety conscious in all your task performances, large or small.
5. Discipline yourself to comply with the Plant general safety regulations listed elsewhere in this book.

TECHNICAL DEPARTMENT SAFETY RULES

Laboratory — General

1. Safety glasses must be worn by everyone in the laboratory at all times.
2. Do not allow a long length of cheese cloth or rag to hang from a trouser pocket or belt loop.
3. Learn to automatically inspect every piece of glassware and apparatus for cracks, defects, etc., before using. This is particularly true when the glassware is to be heated.
4. Make a habit of reporting safety hazards to your immediate superior (or writing them down for future reference) as soon as you observe them; otherwise you will forget them.
5. Do not place pieces of apparatus near the edge of tables or shelves where they may be knocked off and damaged.
6. When a gas burner is used in a permissible area, make certain it is turned off when the work is completed.
7. Keep all sinks clean. Do not allow broken glass and rubbish to accumulate in the corners.
8. Do not store explosives or volatile solvents in glass containers where they will come in contact with direct sunlight.
9. Clean up the area in which you are working as soon as any specific job is completed. Remember that good housekeeping is very essential to safety.
10. Do not attempt to handle any equipment or chemical reagents until you are thoroughly familiar with the hazards involved.

Safety Takes Cooperation

MECHANICAL DEPARTMENT

General Safety Rules for all Shops

1. In no case is heat to be applied to any equipment unless it is ascertained that this equipment is free of hazardous material, except when permission to do so has been received from the Area Supervisor.
2. Be sure that scraps and sweepings are put in properly covered receptacles and that no oily waste is left in the buildings at end of the shift.
3. Keep all material at least one foot from radiators.
4. Watch out for defective equipment and report same immediately to your Foreman.
5. Foreman must thoroughly inspect major repairs before the equipment is turned over to the operator.
6. All equipment must be thoroughly cleaned before turning same over for repairs.
7. No one is allowed to operate equipment until he has been properly instructed and understands the operation of every valve, lever, switch, etc.
8. Machinery must not be operated without guards.
9. Repairs of electrical equipment is to be done by authorized persons only.
10. All electric lamp bulbs burned out in explosive or operating buildings must be replaced by electrician or by an authorized maintenance man.
11. All extension cords must be numbered and sent to the electrical department for monthly checking.
12. Test all lamps in the shop before placing them in any of the plant houses.
13. Carry electric tools in special belt. Also on outside work use safety strap, hooks or pole climbers.

Safety Takes Cooperation

14. Cables, wire, or piping being placed over standard gauge railroad track must clear track by not less than 22 feet.
15. Insist on being instructed as to your duties and how to perform them safely.
16. When working in other buildings always observe house safety rules.
17. Always determine the voltage of the circuit on which the extension cord is to be attached, and be sure that you have the proper voltage lamp in the socket.
18. Mechanics required to enter any buildings in which explosives have been, for the purpose of making minor repairs before it has been wet down, must wear approved powder shoes, or shoes equipped with an approved type of leather sandal. In event of major repairs after building is washed out, powder shoes are not required. The supervisor in charge of the area should inspect the location of the work and pass on its safety.
19. Motor starting switches must be thrown with the left hand.
20. Upon entering a building with a truck, go slower than a walk.
21. Do not permit trucks to stand in dark places when not in use.
22. Skylarking, fighting, throwing, or abuse of equipment is strictly forbidden.
23. When working in explosive building, do not obstruct exits.
24. Explosives, or waste containing the same must be placed in approved and marked containers only.
25. The use of soldering irons and drills will not be permitted in explosive buildings except under the supervision of the Safety Department.
26. Rubbers, galoshes, or any shoes with rubber soles are not allowed to be worn in explosive buildings; they may be worn, however, in magazines.

27. All portable ladders used on hard surfaces are to be fitted with non-skid extension feet. All portable ladders on soft or earth surfaces are to be equipped with pointed iron feet. All single and extension ladders are to be equipped with six feet of ½ inch manila rope spliced on the second rung from the top.
28. Alcohol used in this plant has been denatured. Do not let it get in your eyes.
29. When dismantling buildings men are not to enter the building while other men are working on the roof. All overhead work will be done at one time, after which the men will enter the building and clear away the lumber which has been thrown down.
30. Rail traffic has the right-of-way.
31. Do not hesitate to call fellow employes' attention to unsafe practices.
32. Turn down all nails.
33. Think safety and work safely.
34. WARNING: THE APPLICATION OF COMPRESSED AIR INSIDE THE BODY IS LIKELY TO RESULT FATALLY. ANY INDICATION OF SUCH PRACTICE WILL RESULT IN IMMEDIATE DISCHARGE. DEATH FROM THIS CAUSE IS MANSLAUGHTER AND A PENITENTIARY OFFENSE.
35. Always be sure to use approved equipment for whatever work you are doing. There is a correct tool for every job. This applies especially to the use of protective equipment, such as goggles, gas masks, respirators, etc. DO NOT EXPERIMENT—IF YOU ARE NOT SURE, ASK AND FIND THE CORRECT ANSWER.

Blacksmiths

1. Keep building clean.
2. Before starting work on explosive equipment, be sure that all explosive dust has been cleaned off.

3. Be sure that all waste and scrap material are cleaned up and put in proper place.
4. Do not use defective equipment.
5. Keep matches in metal containers with permit.
6. Make certain that fire in forge is out before leaving building at completion of work for the day.
7. Keep Cyanide in special container and locked up except when in use. (Cyanide is to be used only by Blacksmith or in his presence.)

Carpenters

1. Turn down all nails and screws.
2. Keep all scrap material piled neatly.
3. Put all tools in their proper place when finished using them.
4. Do not use defective tools.
5. Use a tool only for its intended purpose.
6. Do not operate machinery unless all guards are in proper place.
7. Keep all dry powder jobs wet down.
8. Keep all oily rags and waste in metal container provided for that purpose.
9. Do not allow oil or grease to accumulate on floor.

Electrical — General

(1) Material

It shall be the duty of the Electrical Foreman in charge of the work to check and inspect all materials received for electrical work as follows:

(a) That material is received as ordered.

(b) That it is undamaged—that it is in proper condition for use.

(c) That it is the correct material for the application, even though it conforms to requisition requirements.

It shall be the Foreman's duty to report on any material which does not conform to these conditions and hold up use of same pending approval of the Chief Electrical Foreman who will be responsible for such conditions being brought to the attention of proper persons for investigation and final settlement.

(2) Other Precautions

The following additional precautions shall be taken:

(a) Before starting any "hot" work the Electrical Foreman in charge of the work shall inspect all adjacent circuits, including insulation, and properly protect bare spots, etc.

(b) "Hot" work must not be performed over, under, or unreasonably adjacent to moving machinery.

(c) The area in which "hot" work is being done must be roped off, proper signs placed, and the area kept clear of those persons not directly connected with the work in a working, supervisory, or safety capacity.

(d) No live wires shall be cut loose before precautions have been taken to prevent them falling across equipment, persons, etc., by tying them to prevent such injury or destruction.

(e) Always remove electrical wiring and equipment as soon as it is no longer needed at that location.

Electric Arc Welders

1. Wear sufficient clothing of a kind that is closely woven to protect all parts of the body from the rays of the arc, also protect yourself and others against hot metal.
2. Use a mask to protect your eyes and face when exposed to electric welding operation.
3. Keep yourself insulated from ground or metal objects nearby when changing electrodes.

4. Use a shield to protect everyone nearby from the rays of the arc. Warn all spectators and your fellow workers not to look at the arc.
5. Be careful in making welding machine ground connections. Make these to direct ground whenever possible. When connecting to metal structures, make sure you will not cause a fire at some distant point.
6. Never use combustible material to support your work.
7. Wear a pair of approved clear glass goggles to protect your eyes when hammering scale.
8. Never weld any pipeline, tank or portable container without first obtaining positive proof that it has been properly cleaned.
9. Never weld to, or close to, a conduit carrying live electric wires.
10. Keep a fire extinguisher within reach at all times while welding.

Elevator and Scales Dept.

1. Do not use defective tools.
2. Never attempt to enter or leave elevator while it is in motion.
3. Use brass hammers in all explosive buildings.
4. Never go under elevator without securely blocking same. Always pull switches or open circuit breakers before starting to work on machines.
5. Never start an elevator unless an assistant has ascertained that elevator is clear and remains where he can see elevator.
6. Never allow explosive dust to accumulate on cables, sides of hatch, or overhead machines.
7. See that all safety devices are in good working order and properly lubricated.
8. Select exit before starting work in building known to contain flammable or explosive materials.

Gasoline Engine Garage

1. Do not operate engines with the garage doors closed.
2. Do not solder gasoline tanks until they have been thoroughly steamed and cleaned. Foreman must check before proceeding.
3. Do not allow oil and grease to accumulate on floors.
4. Thoroughly clean gasoline equipment before attempting to make major repairs.
5. Do not use open flames in vicinity of gasoline tanks.
6. Do not use gasoline containing lead for cleaning purposes.
7. Do not use straight gasoline for cleaning purposes unless blended with carbontetrachloride (60%-40% mix). Do not use this mixture except in well ventilated location. Avoid contact between the liquid and skin.

Millwrights and Machinists

1. Do not attempt to clean or repair machinery while it is in motion.
2. Do not use unsafe ladders. Lash ladders overhead with safety rope when possible; otherwise, have a man hold ladder.
3. Use brass hammers in all explosive, TNT, or Ammonium Nitrate buildings.
4. Never use a defective extension cord.
5. When you repair explosive equipment, be sure that you first clean all explosive and explosive dust from same. Always wet down machines and tools.
6. When working in explosive buildings do not obstruct exits. Pick your exit before starting to work.
7. Always remember you are working around a hazardous material. **TAKE NO CHANCES.**
8. Be sure that all waste and scrap material is cleaned up in all buildings after your work is completed.

Safety Takes Cooperation

9. Do not use defective tools.
10. No valves are to be operated by men in this department without obtaining the proper authority. No fire line valves are to be operated without permission and in presence of a representative of the Fire Department.
11. Do not wear finger rings while operating machinery.
12. Do not use files without handles.
13. See that material being worked is securely held in place.
14. Get help when handling heavy materials.
15. Remove burs and sharp edges whenever feasible.

Oilers

1. Be sure that the sleeves of jumpers are tight, and that no frayed ends or piece of waste protrude from wrist bands, pockets, etc.
2. Do not attempt to clean shafts while in motion.
3. Do not oil cone pulleys from driven end; you may get caught by the belt.
4. Do not fill grease cups of mixer pulleys unless assisted by helper, as pulley may start revolving and catch your arm.
5. Be especially attentive to block breaker bearings, seeing that they are properly oiled at all times.
6. Do not over-oil a bearing or machine so as to cause excess oil to drip.

Painters

1. Wash your hands thoroughly and remove paint from under finger nails before eating.
2. Do not use unsafe ladders; lash ladders overhead with safety rope when possible; otherwise, have another man hold ladder.

3. Do not hold onto or walk on wet painted surfaces.
4. Use gloves when removing broken glass from window sashes. Place pieces of broken glass in receptacles provided for that purpose.
5. Do not leave oily or paint coated rags overnight in building. Always place in covered metal waste cans and empty daily.
6. Do not use defective equipment.
7. Properly close cans of all solvent or inflammable material after using, and keep minimum requirements in working shop or area.
8. Use chicken ladders, properly secured on roof work.
9. When working on steep roofs or high elevation, wear safety belts properly secured.
10. Never paint in vicinity of electrical equipment or wires before checking hazards of same with the Electric Foreman.
11. Always use approved masks or respirators when spray painting. Provide adequate ventilation when painting indoors, especially in confined locations.

Pipefitters

1. Do not attempt to clean or repair machinery while it is in motion.
2. Do not use unsafe ladders. Lash ladders overhead with safety rope when possible; otherwise, have another man hold the ladder.
3. Do not operate machinery or apparatus that is defective or unsafe. Notify your Foreman immediately.
4. Never use a defective extension cord.
5. Use brass hammers in all dry explosives or TNT buildings.
6. When working in explosive buildings, do not obstruct exits.

7. Do not use tools with mushroom heads, splintered or loose handles. Have all tools in good condition at all times.
8. No valves are to be operated by men in this department without obtaining the proper authority.
9. No fire line valves are to be operated without permission and in the presence of a representative of the Fire Department.
10. Be sure that all waste material is cleaned up in all buildings after your work is completed.
11. Do not operate any equipment in shop unless authorized to do so by Foreman.

Tinsmiths

1. Use brass hammers in all explosive buildings.
2. Repairs in hazardous areas are to be inspected by Mechanical Foremen before starting work, and by the Supervisor in charge of that area.
3. Any person who has occasion to use a fire of any description is not allowed to leave the shop until he has secured his match permit and matches from the Foreman. At no time will he be allowed to light same until the Safety Department has located a position of safety for that purpose.

POWER DEPARTMENT SAFETY RULES

Boiler Room

1. Do not light off the coal or oil burner without the use of proper equipment.
2. Never put fire under the boiler unless the water level and water columns have been checked.
3. Check safety valves before putting the boiler on the line.

4. Check blow-down valve before putting boiler in service.
5. Wear gloves and goggles when lighting fire.
6. Do not use hands in the coal feeder to remove foreign objects.
7. Do not open any port on boiler that is in operation without wearing goggles or mask.
8. Always wear goggles, face shield, and asbestos gloves when removing slag.
9. Do not enter furnace unless you have a permit, and all its requirements are fulfilled; including goggles, safety hat, all switches tagged out, and the necessary valves locked.
10. Do not enter boiler drum unless you have a permit and have locked out all steam, and water valves, and have tagged out motor switches.
11. Use only a standard vapor proof extension cord that has been checked just before you take it into boiler or furnace.
12. Always have a second person outside of boiler drum or furnace before you enter it.
13. Check soot hoppers and see that there is no burning soot before you enter.
14. Lock out steam valves on fan turbines before entering fan or working upon it.
15. Pull the disconnects, and tag them before working on a mill.
16. Always use dark glasses for observation of a furnace fire.
17. Do not stand in front of burner ports when boiler is being put on coal.
18. Do not use faulty torches when lighting a boiler.
19. Always remove coal from idle mill by hand, not by blowing it into the furnace.
20. Never work on any steam line or other equipment unless you are thoroughly familiar with all connections to it, and have advised the boiler operator.

21. Keep all the water column shut-off valves locked open.
22. Collection of unburned fuel in the ports of the boiler may cause a bad puff if the door is opened carelessly.
23. In taking a boiler off the line, put an oil tip into each burner before the coal mill is shut off to be sure that all unburned coal is consumed.
24. Never put an oil burner into a furnace unless you are sure that the atomizers are in place.
25. Keep all burner cover glasses closed when burning coal, except for the center glass which should have small opening to prevent coal from depositing in the central tube.

Switchboard

1. When taking turbo-generator out of service always close throttle valve before opening main oil switch to prevent machine from running away if governor or overspeed trip fails to operate.
2. Have bleeder line on General Electric turbine thoroughly drained before placing turbine bleeder valve in service.
3. Never use tools near collector rings or commutator when a machine is in service or allow water to come in contact with them.
4. Always trip throttle valve by hand before overspeeding a turbine.
5. Before starting a steam turbine see that all drains are open and free of water, and turbine is thoroughly warm before placing in service. Admit steam slowly.
6. When cutting out equipment for repair work to be done, be sure all valves are closed and locked. Also, drains must be open and all pressure released.
7. Never use compressed air without goggles.

8. Do not open air disconnect while current is flowing through circuit—use oil circuit breaker.
9. Do not pull disconnects or De-ion fuse by hand but use proper pole provided, being sure pole is dry and is non-conducting material.
10. Never charge any circuit without orders from Shift Supervisor.
11. When an electric circuit is taken out of service for work to be done on line, be sure oil circuit breaker is open and racked out, disconnects pulled, locked and tagged with man's name authorizing cutout on the tag; also, information written in Engine Room log book.
12. Never foul an interlock without special permission from Shift Supervisor.
13. Never replace fuse without rubber gloves.
14. Never do any repair work or make any changes on electric circuit while circuit is charged with electricity.

Turbines

1. Before starting a steam turbine see that all drains are open, and it is free of water and the turbine is thoroughly warm before placing in service. Admit steam slowly.
2. Never clean or repair any machine while in motion.
3. Be sure all steam traps are cut in and operating on pressure reducing valve station before putting pressure reducing valve in service.
4. Never switch pressure reducing valve from automatic to manual or manual to automatic unless the loading pressure is equalized.
5. Never pull a disconnect on a circuit while motor is running. Shut motor down or report to Shift Supervisor.

6. Have bleeder line on General Electric turbine thoroughly drained and drain open before placing bleeder valve in service.
7. Never use tools near collector rings or commutator when machine is in service or allow water to come in contact with them.
8. Always trip throttle valve by hand before overspeeding a turbine.
9. When cutting out equipment for repair work to be done, be sure all valves are closed and locked; also, drains must be open and all pressure released.
10. Never use compressed air without goggles.
11. Never change oil or clean movable parts of equipment until throttle or switch is tagged and locked and recorded on Engine Room log book and signed by operator doing the work.
12. Do not get on or around overhead crane until the switch is pulled, tagged and locked.
13. When putting an air compressor in service check to see that all drains on air cylinders are open and cylinders are free of water.
14. Never stand in front of air cylinder when starting machine.
15. Never start an air compressor with discharge valve closed.
16. Never allow oil and water to accumulate in air receivers; keep drained.

Pumping

1. Never work on or around moving parts of a pump with loose clothing, or with a rag in your hand.
2. Check safety and relief valves monthly by operating by hand.
3. Check emergency governor on the boiler feed pump turbines every time the pump is started or stopped.
4. Do not allow alcohol leakages to accumulate in ditches, etc., as they are a fire hazard.

5. Prevent leakage of hydraulic water, which may injure your skin or eyes.
6. Do not remove gear case covers while pumps are in operation.

Coal Handling

1. Be sure that all vapor globes, switches, and other electrical equipment are in place before starting the coal conveyor.
2. Do not climb over conveyors.
3. Do not allow coal dust to accumulate anywhere.
4. Keep clear the cables at all times unless the winch motor switch is locked open.
5. Do not start the drag line equipment if there is anyone inside of the fenced area.
6. Stay out of the winch house unless the doors to the two control rooms are locked.
7. Never use any but approved wrenches for opening hopper doors on the cars.
8. When using the car mover, be sure that it is properly placed on the rail and protect yourself from falling if it should slip.
9. Stay off of the tracks when cars are being moved.
10. Never work on or under a car unless the proper protective signs have been placed on the track.
11. When unloading a car, be sure that your wheels are blocked to prevent it from moving unexpectedly.
12. Do not hook up an oil car unless the warning signs have been placed in both ends.
13. Use dust proof goggles and respirators when there is coal dust in the air.
14. Do not use electric drills or any electrical equipment which is not vapor proof around the coal handling equipment.
15. When repairs are necessary, always wet down the part to be repaired and any other parts that may be affected.

16. Use only approved flashlights and light cords in dusty locations.
17. Gloves should be worn to protect the hands.
18. Keep foreign materials, especially paper, wood, straw, etc. out of the coal at all times.
19. Remember that coal dust suspended in the air may easily create an explosive atmosphere which can be ignited by a stray spark.

RAILROAD SAFETY RULES

General: It is difficult to cover in Safety Rules every condition that may develop in our railroad operation. We expect each man to use good judgment so that he, himself, and other employes are not injured, and that there is no property damage.

FAMILIARIZE YOURSELF WITH THE SAFETY RULES, and if in doubt as to their meaning, apply to your Supervisor for an explanation. In addition to the following rules the bulletin board, in the Yard Office, should be checked daily for further safety instructions.

1. Keep off all tracks except in the discharge of duty, and when stepping out of the way of approaching trains, engines or cars, go far enough to clear all running tracks.
2. Before stepping upon, or crossing a track, look in both directions.
3. Do not go under an engine or car, or pass between cars separated by a short distance, without knowing that proper protection against movement has been afforded.
4. Do not step on the coupler when crossing between standing cars.
5. Before coupling air hose or doing other work between the cars of a train, you must see that your position is known to the men who are operating the railroad equipment, and that you are protected against the movement of the train.
6. Running or walking on the tracks immediately ahead of a moving car or train is prohibited.
7. Do not sit on a brake wheel.
8. Do not extend any part of the body beyond the outside clearance line of the cab

or car without exercising care to avoid being struck.

9. Do not couple, or move, cars on a track where cars are being unloaded, without first notifying persons in or around them of the move to be made.
10. When switchmen are riding the leading footboard of an engine, they must be outside the rail, and in view of the engineer.
11. Hand brakes must be tested by switchmen before depending on their use.
12. Going between or under moving cars or engines is prohibited.
13. Before going between standing engine and cars or between cars—
    (a) Give hand or lamp stop signal and wait for acknowledgment, unless other clear understanding has been made to protect against unexpected movement.
    (b) Wait for slack to run out.
    (c) If cars are on grade, know they are secure.
14. Look in both directions to see whether cars or engines are approaching before going between cars, or engine and cars.
15. Use lever to uncouple. If lever is inoperative, have proper understanding and full protection before attempting to lift lever by other means.
16. The use of both hands at the same time on Carmer release lever is prohibited. Placing full weight with one or both feet on Carmer release lever is prohibited.
17. Using finger in hole at bottom of coupler to adjust lock pin is prohibited.
18. Giving signal to stop and then stepping on track between or in front of engines or cars before such movement is completed is prohibited.
19. Stepping from one car to another after cut has been made is prohibited.

20. While riding on engine or car, operating release lever on car or engine other than on the one on which riding, is prohibited.
21. Do not stand on side steps or footboards of engines in motion to make repairs or adjustments.
22. While on running board of engine maintain secure hand hold.
23. The use of any part of a car truck as a step when getting on or off moving cars is prohibited.
24. When coming out of gangway of engines to steps, getting off top of tender, or car equipped with vertical ladder, face the equipment and place ball of foot firmly on step or ladder before placing weight on same; also do not have tools in hand.
25. Hanging on car door with feet on truss rods or hanging on hand holds with feet on trucks is prohibited.
26. Maintain lookout in the direction engine or car is moving to avoid coming in contact with structures alongside or over track or with cars or locomotives on adjacent tracks.
27. Be prepared to avoid injury from sudden starting, stopping, lurch or jerk of locomotive or cars, by facing direction it is moving, by being braced and holding, or prepared to do so at once, and by moving about only when necessary for the performance of duty.
28. Walking or stepping on rails, frogs, switches or guard rails is prohibited.
29. Place cars or engines at a safe clearance from switches.
30. Sew, tie, pin or otherwise fasten cuffs of overalls or trouser legs to avoid tripping.
31. Do not use foot to adjust drawbars, knuckles or brake shoes.
32. Do not adjust drawbars, knuckles or brake shoes while cars or locomotives are in motion. In all cases the slack must be per-

mitted to run in or out before this work is performed.

33. Riding on leading footboards while coupling to cars is prohibited.

34. Do not step between nor in front of moving cars or locomotives to:
    (a) Couple or uncouple cars or locomotives.
    (b) Connect or disconnect hose.
    (c) Adjust knuckles or couplers.
    (d) Turn angle cock.
    (e) Lift pin.

35. Uncoupling air hose on lines having angle cocks clamped open, before pressure has been depleted, is prohibited. Uncouple hose with hands or authorized tools.

36. Before uncoupling hose by hand, have both angle cocks on air line closed, firm hold with both hands on hose, gradually break connections, if possible, to reduce pressure remaining in hose, before completely uncoupling.

37. Before reducing brake pipe pressure with angle cock, take a position clear of hose or hold hose firmly to prevent it flying around.

38. Boarding an approaching locomotive or car from a position between the rails is prohibited.

39. Boarding or jumping from rapidly moving cars or engines, is prohibited except to avoid impending accident.

40. Do not permit employes, whose duties do not require such transportation, to ride on engines or cars.

41. Do not ride on end of loads when such loads are liable to shift from impact of coupling, when slack runs out or by ordinary train movement.

42. It is prohibited entering upon repair tracks, coupling to or moving cars thereon, before

car inspector signals have been removed by an authorized person.

43. Car inspectors and car repair men must display signs, or Blue signals at a suitable distance from both ends of any equipment upon which they may be working and the switches at both ends of the track must be locked.

44. Switching or coupling on to trains, or giving signals to move trains or cars which display any signs or signals irrespective of what tracks trains are on is prohibited until such signs or signals have been removed by authorized person.

45. The use of intoxicants in any degree will positively not be tolerated.

46. Report at once to your Foreman or Supervisor any defect in track or rolling stock.

GENERAL SAFETY RULES COVERING ALL EXPLOSIVE OPERATIONS

1. In case of fire or explosion go to nearest shelter as quickly as possible, unless you are a member of the Fire Brigade—in which case you will go to your assigned station.
2. Do not allow any unauthorized person to operate your equipment. When you need relief call your Foreman.
3. Do not operate any defective or unsafe equipment; shut down and report to your Foreman. This includes hot bearings, loose glands, presence of static electricity, etc.
4. Do not attempt to repair, alter or adjust any of your equipment but report the condition to your Foreman. Such work must be done by the specified repair man.
5. Keep building, floor and equipment clean at all times.
6. Keep passage-ways and exits clear at all times. See that exits open freely. Remove ice, snow, or any obstructions before starting operation.
7. Do not sweep any explosives out of the building. Dispose of such materials by placing in the proper can.
8. Always use non-sparking tools unless otherwise specified.
9. Do not operate equipment until you have been properly instructed.
10. Unlock all doors of a building before starting work in the building.
11. See that all ventilation fans are running while you are in the building.
12. Always use the proper type of air hose with a grounded metal nozzle, and avoid any whipping of the hose.
13. **No lunches or parcels of any kind** can be carried into an operating building.

Safety Takes Cooperation

SMOKING IS

NOT PERMITTED

In The

Operating Buildings

Or Areas

Of The

Ravenna Ordnance Plant

ROP
RAVENNA ORDNANCE PLANT
VOL. 3 JANUARY No. 1



R.O.P.'s "WOW" Girl

Additional Pictures on Pages 10 and 11

ABSENTEEISM

A Form of Nazism

"MISSED my ride—will be in tomorrow". Translated into wartime American language would read something like this: "I am wholeheartedly in favor of Nazism" or "To hell with the boys who are fighting and dying for me and mine."

If we lived in England and our excuse was so puny, we would be liable to four hundred dollars fine, plus three months imprisonment. If we were ot German citizenship we would be ushered to work at the point of a gun and the S. S. men are of an extremely nervous character, always hoping that the person at the point of their gun might make some remark or otherwise indicate disapproval enabling him to shoot us on the spot. If we were Japanese (we wouldn't give excuses in the first place) and it was found not to be a matter of life and death, we would lose our head via the ax.

Every country in the world has its own method of handling the problem of Absenteeism. Here, "they take our word" when we say "I was sick," "my wife was sick and I had to stay home," "The car would not start," etc. The worst that could happen to us would be the loss of our job when we are absent too frequently.

"They take our word"—Just like the fellows in our armed forces do. Everyone has a conscience, but everyone won't admit it. Some of us are such efficient story tellers that we believe ourselves. In any war, the number of slackers about equals the number of casualties, but "they take our word." Every individual who takes advantage of this fact can also take credit for at least one war casualty—which may be far from home, or home ties, or it may not be.

Sure, we will win the war, but only if we pull together. When we say: "I did my part," let's have a clear conscience. We don't notice any of the boys in the battle zones taking a day off. We fight when we produce . . . **Every** working day. Let's do it!!

They Cause Editor's Headache

AS we look back over the year 1942 we review many of the things that give an editor a headache. Maybe we'll be able in some manner in 1943 to ease the situation. However, we learned a lot of things.

Getting out a paper isn't by any means a picnic.

If we print jokes, many people say we are silly. If we don't print them, they say we are too serious.

If we stick close to the office all day, we should be out hustling news. If we go out to do some hustling, we should be on the job in the office when folks call.

If we don't use all the poetry, cartoons and articles submitted we haven't the brains to appreciate genius. If we do use such material, we are told the paper is filled with "junk."

If we make some changes in the other fellow's copy, we are too critical. If we don't make any changes, we are asleep at the switch.

If we clip things from papers and magazines, we are too lazy to write copy ourselves. If we don't clip anything, we are stuck on our own stuff.

Some will say that we clipped the above from some publication. Well, they'll be right. We did.

ROP
RAVENNA ORDNANCE PLANT

Official Publication of the Ravenna Ordnance Plant of Ohio

Vol. 2

Paul A. Ryan.....Editor

Frank Lukas.....Photo Editor
Donald F. Rowley.....Assistant Editor

Division Editors

Joe Bassett.....Sports and Recreation
Miss Lois Bowen.....War Department
Miss Rose Marie Fletcher.....Commissary
Miss Colette Corrigan.....Procurement
Mrs. Bernice Chiara.....Transportation
Jess Dempster.....Fire
Mrs. Mary E. Einhouse.....Safety Engineering
Miss Kathryn Fell.....Medical
M. J. Gribben.....Accounting
S. S. Griffith.....Load Lines
D. S. Long.....Planning and Production Control
A. I. McIntire.....General Engineering
Mrs. Arloene Rockey.....Control Laboratory
Edward R. Sanders.....Fuze and Booster Lines
Mrs. M. Cogswell.....Industrial Relations
Miss Ella Mae Smith.....Financial
Sgt. K. W. Vincent.....Protection
P. H. Wickham.....Plant Engineering

Write Often, Write Cheerfully

The War Department, according to Secretary of War Stimson, considers the transportation of mail to the fighting fronts second in importance only to the food supply! That's proof of the need to write often and cheerfully to your friends in the Army, Navy and Marines.

So why wait . . . write today!





EMPLOYE SERVICES . . .

With the inception of the Ravenna Ordnance plant came the glaring need for special accommodations for employes who are doing their part in this War as "Production Soldiers."

Pearl Harbor and subsequent shortages of living essentials and transportation facilities brought an even greater demand for services for employes. The Atlas Powder Co. has made it a practice to give employes the best that can be had and as conveniently as possible.

To this important end, all other considerations have been forced into the background. As new features develop, the company expands its list of facilities.

The following article, a digest of all "Employe Services," was written to give employes a ready reference of the facilities "at their finger tips." If you have the slightest query or problem, you are invited to contact persons in charge of each of the services and they will be glad to serve you.

Plant Transportation Advisory Committee

AS each day passes, the need for further tire and gasoline conservation becomes more evident. Word has emanated from Washington that the stock of natural and synthetic



rubber which will be available for civilian use during 1943 is far below the minimum amount which will be required.

This, added to the fact that the Eastern states are already undergoing further serious restrictions on the use of gasoline because of Army needs, should serve as a warning that we should use our cars only when necessary.

Mindful of this, officials of the Transportation Department and the Plant Transportation Advisory Committee instituted a "Share-the-Ride" program some months ago. The program has met with considerable success but there still remains a great deal that can be done to improve our situation.

To make our program really effective, the following points should be followed:

1. Persons driving alone should contact their "Share-the-Ride" Captain to obtain a ride at least part of the distance to the Plant.

2. Persons with one or two passengers should arrange to alternate the use of their cars with others driving from the same general area or should make arrangements for all of them to ride in one car all the time. This, too, can be arranged through the "Share-the-Ride" Bureau.

The Plant Transportation Advisory Committee is set up to pass on and certify to local rationing boards the occupational gasoline and tire needs of R. O. P. employes. This service has been provided to enable employes to obtain, as quickly as possible, the tires, tubes, recaps, and gasoline which is needed.

New employes, employes who have not been previously certified for supplemental rationing, or employes who, for occupational use, need additional gasoline, should apply to the Personnel Representative for their Department. This Representative will prepare necessary forms and instruct employes on further procedure.

Persons who live in dormitories and whose families are located at another point, may be given consideration for extra gasoline to travel periodically to and from that point. Persons who require extra mileage for emergency trips, such as deaths in the family, serious illness, reporting to a draft board, etc., may receive consideration by contacting their Personnel Representative in the manner cited above.

In any of the situations outlined above, it should be pointed out that extra mileage can be obtained only when other transportation is not available or would require an excessive amount of time.

Rationing officials have advised the P. T. A. C. that they are unable to issue gasoline coupons to persons traveling east of Ohio because of stringent restrictions in the eastern states.

It should be pointed out that employes too have an obligation regarding mileage rationing. In instances where persons are no longer driving their own cars but are riding buses or with others, THEY MUST MAKE THIS FACT KNOWN TO THEIR PERSONNEL REPRESENTATIVE. The information will be passed on to the local board so that future requests by such employes for gas or tires will be honored.

All persons in the U. S. driving cars must comply with the requirement that their tires be inspected periodically by qualified O. P. A. inspectors.

NO CERTIFICATION FOR TIRES, TUBES, RECAPS, OR GASOLINE CAN BE MADE BY P.T.A.C. TO A LOCAL BOARD FOR PERSONS WHO HAVE NOT COMPLIED WITH INSPECTION REQUIREMENTS.

The Advisory committee, working in cooperation with management of the Atlas Powder Co., has made it as convenient as possible for employes to have their tires inspected on the premises while they are at work.

Inspection

Arrangements have been made with the B. F. Goodrich Co. to inspect the tires of R. O. P. employes. Such inspections have been going on since early January and will continue until early February. A force of qualified O. P. A. inspectors will visit every parking lot and inspect the tires of those who give them authority to do so. At least 24 hours notice will be given prior to a visit of O. P. A. inspectors to the parking lots. After the first week in February, employes may bring their cars to the Service Center in the old Administration Area for tire inspection.

Employes are requested not to delay in having inspections completed at once if possible, either on the lot or at the Service Center or through any qualified inspector. DO NOT DELAY!

Services

In addition to inspection service, B. F. Goodrich has set up, in the old administration area, a Service Center for the convenience of R. O. P. employes. For any of the services listed below, which will be supplied at standard-approved rates, TELEPHONE 8332.

A. TIRES—Fix flats, mount spares, off-the-wheel and on-the-wheel inspections, rotate tires, arrange for replacement of new tires, recapping and repairing services.

B. BATTERIES—Hydrometer testing, battery charging, battery rentals, and replacements.

C. GASOLINE—Furnish four gallons in container at Service Center.

D. ROAD SERVICES—Delivery of one gallon of gasoline, fixing flats, mounting spares, emergency starting battery service, putting in new or rental batteries, emergency starting of cars where no wrecker service, ignition, or other mechanical failure is involved.

Seven men will be employed at the Service Center, enabling employes to take advantage of 24-hour service.

Personnel Service

THE Company has long recognized that employes are apt to have problems which are outside the scope of those which can be handled by specialized Service Divisions, such as the Housing Division. These problems are varied, and may relate to such matters as a desire for transfer to a different type of work, domestic, such as child care problems, or financial situations which have an adverse effect on the employe's ability to maintain his job schedule or do his work well, or certain problems relating to transportation, shifts, or working conditions. All such problems can be taken up by the employe with a designated Personnel Representative in the Industrial Relations Building.

The Personnel Representative is equipped by training and experience with the Company to interpret Company policies and procedures to employes, or to guide the employe to the proper person, Division, or outside public agency for a solution of his particular problem.

The way in which the Personnel Representatives serve the employes can be illustrated by the typical case of John Doe, employed as a line operator, who thinks he would like a job as guard. John hesitates to approach his immediate supervisor, as he is not sure of his superior's reaction to such a suggestion. He approaches the Personnel Representative who assures him that all supervisors in the Plant are familiar with the transfer procedure and that the employe will not be subject to any discriminatory action as a result of presenting his request to his supervisor. At the same time, the Personnel Representative advises the employe that he is not eligible for transfer until he has served in his present capacity for a period of 60 days, and that his supervisor is not obligated to forward his request for transfer through the proper channels unless the employe has done the kind of job which merits favorable consideration of his request. The employe is further advised that before a transfer request is forwarded, it must be accompanied by a rating scale made out by the Supervisor as a means by which the employe is rated as to quantity of work, quality of work, safety performance and other performance factors. The employe is told that all such transfer requests accompanied by rating scales are considered along with the man's previous experience and other qualifications as shown by his original application on file in the Personnel Division by the Committee on Transfers and if approved for further consideration, that all of this material is presented to the supervisor of the department to which the employe desires transfer. John is advised that approximately half of all transfer requests through this established procedure are effected and that written notice of the disposition is given to John's supervisor. And finally, John is told, in the event his transfer request is not approved, a copy of the notice to the supervisor is sent to John himself, with a clear explanation of the reason for failure to effect the transfer.

The Personnel Representatives also have a definite function in the established Employe Adjustment Procedure. Any employe having a complaint which cannot be satisfied through his supervisor or through his department head may refer that complaint to the Personnel Representative. Matters which cannot be satisfactorily adjusted by the Personnel Representative within three days time are referred to the Grievance Committee. This entire adjustment is clearly outlined in detail on posters which are placed on bulletin boards throughout the plant.



EARLY in the War Bond campaign, the Atlas Powder Co. made arrangements with Federal Reserve Banking officials in order that employes might purchase War Bonds through the medium of payroll deductions.

This step eliminated the necessity of going into banks or other War Bond sources to make the purchase, and provided an easy means of payment for them. Too, while many of us had to make a sacrifice in the purchase of War Bonds, it became somewhat easier for us to allocate our funds to meet our various obligations when we made provisions to have the money taken out of our pay towards the purchase before we received it.

Payroll deductions have also provided a methodical and efficient means of building up a backlog of funds, looking towards the time when we will need it a great deal more than we do now. Moreover, the payroll deduction method of purchasing War Bonds made it easier for us to do a job that we all wanted to do—that of giving every possible help to the boys in the Service in prosecuting the War Effort to the Utmost.



IT has long been the policy of the Atlas Powder Co. to provide clothing and footwear for employes who require them.

Since operations began, the Plant has furnished, without cost, 21,000 pair of ladies' slacks and blouses, 8,000 pair of men's coveralls, 2,300 inspector's white coats, 600 raincoats and 400 pair of pullover boots.

Because special shoes, designed for use where explosives are handled, are required for the safety of employes, the Plant has furnished them to employes at half price. This was done on the basis that employes would have to buy shoes in which to work but because the Plant placed certain restrictions on the type, they should bear half the cost. Cost to R.O.P. during 1942 was approximately $125,000.

Joint Production Committees

EARLY in September the Atlas Powder Company, in cooperation with the War Production Board, organized Joint Production Committees at this Plant.

It is with this plan that employes are given the opportunity to be of double service to the War Effort. The personal knowledge and ideas of employes can thus be put to use in furthering the War Effort.

Suggestion boxes have been placed throughout the area, together with suggestion forms. Suggestions are collected daily and are sent to appropriate committees for analysis and recommendation.

Approved suggestions are reviewed by the Policy and Award committee who make such awards as may be merited.

Since committees were elected on October 1, there were, as of January 1, 1943, 1493 suggestions submitted, of which 102 were accepted for recognition or award.



SINCE the institution of training at R.O.P. 67 employes have received instruction. Many more have begun courses and will finish them within the next month.

A total of 2,300 female employes of the Fuze and Booster Lines were instructed from February to September, 1942, for positions as line operators, matrons, and inspectors. In addition, 204 were enrolled in forelady conference groups. A forelady's club, emanating from these meetings, now has a paid membership of 90 persons.

Since May, 1942, 510 employes from all departments have taken Job Instruction Training, authorized by the War Manpower Commission. This 10 hours of study prepares employes to teach others to do their jobs.

Of the employes taking Job Instruction Training, 453 employes also were instructed in Management Principles and Methods. This instruction deals with the fundamentals of management methods and techniques of handling people. Instruction takes 30 hours.

Fifty-three Maintenance employes have taken special six-month courses in Mechanical Drawing, Blue Print Reading and Shop Mathematics. The course is offered to those who need to refresh their techniques and for upgrading.

Additional courses in adult education were arranged and are now in operation at nearby colleges and universities.



FOR the convenience of permanent residents of the reservation and of employes who work the 12 to 8 shift, religious services are now being held each Sunday in the Private Dining Room of the New Cafeteria.

Catholic services start at 8:30 a. m., with Protestant services at 9 a. m.

Cafeteria

THE Ravenna Ordnance Plant is fortunate in the compartive excellence of its eating facilities. Hot meals are provided for employes 24 hours a day through the main cafeteria, located in the New Administration Area. In addition, subsidiary units have been established and are in operation on all of the operating lines and are open when necessary to service the food needs of employes.

Visitors from other ordnance plants have frequently remarked that the cafeteria service at the Ravenna Ordnance Plant is second to no ordnance plant in the country. This includes general excellence of the food, cleanliness of surroundings, efficiency of operation, and cost to the employe.

The opinions are substantiated by a report of DURRIES CRANE, Consultant from the Office of the Chief of Ordnance. He states that the "method of application of the pattern of management is superior to anything encountered and particularly the excellence of the cooking of food served here, as well as sanitation, cleanliness, discipline, co-ordination . . . is most gratifying"

Since many of our employes live on the premises, it was found necessary that the incidentals of good living be made available to them. For this reason, the cafeteria service includes a division which handles the sale of cigars, cigarettes, candy, magazines, underwear, shirts, socks, caps, gloves, scarfs, handkerchiefs, work trousers, jackets, shaving cream, soap, tooth paste, women's stockings, nail polish, and all types of cosmetics.

Moreover, a laundry service and dry cleaning service has been established which provides this essential service with a minimum of effort on the part of the employes. Laundry may be left any day except Sunday between the hours of 7:30 a. m. and 10 p. m. Clothes are returned in 48 hours if left before 10 a. m.

R.O.P.'s barber shop was moved to the New Cafeteria Building on January 25. It is open from 11 a. m. to 8 p. m., Monday through Friday and from 11 a. m. to 6 p. m. on Saturday.

Recreation

"HE who makes wise use of his life allots a goodly portion of it to recreation" has long been the slogan of the Recreation Division of the Atlas Powder Co.

A survey of the participation in summer sports places the total at 15,652. An additional 6,815 persons were spectators at summer sporting events which included tennis, golf, archery, baseball, softball, volleyball, badminton, horseshoes and rifle and pistol shooting. Free moving pictures were shown twice a week during the past summer.

The Plant's baseball team won the Portage County Baseball League title.

In full swing at this time is a full schedule of winter activities which include bowling, basketball, badminton, volleyball, ping pong and ice skating. Eight teams took part in the football tournament held in the fall.

A varsity basketball team has been organized and is now in the midst of a schedule which includes opponents of semi-pro and Class A calibre.

Musical organizations, such as chorus and bands have been practicing regularly. A fine chorus is outstanding among this group.

An R.O.P. Recreation Association, in its first year of organization, has sponsored two major dances and sponsored a project to pick out the typical Ordnance Worker—R.O.P.'s "W.O.W. Girl"

All employes are eligible for membership in the Recreation Association and invited to take part in any sport or activity. The cost is $1.00 per year. Any employe wishing more information on recreational activities may call Recreation Division in the Industrial Relations Building. Phone 8202.



IN order to insure the well-being of every employe of the Atlas Powder Company, each one is given a thorough medical examination by competent physicians before being hired. This examination serves a three-fold purpose:

1. It is an assurance that no employe will be assigned to a task for which he is not physically qualified.
2. It serves as a safe-guard for all employes of the plant, endeavoring to eliminate those who might have a communicable disease.
3. Frequently, persons who are examined prior to employment and who are found to have physical defects or other ailments which are in need of correction, have had no prior knowledge of their condition. These persons are often able to correct these conditions before any serious impairment of health occurs.

We all know that many of us are subject to colds, throat conditions, and other ailments of a minor nature, which prompt attention by competent medical personnel can correct with little or no loss of time if caught early enough. Our Medical Department and the dispensaries on the Lines are always available for such treatments for the employes. A good-sized hospital, excellently appointed, is available to those who become injured or otherwise incapacitated in the performance of their duties on the Ravenna Ordnance Plant premises. Nothing has been left undone in either staffing the hospital with adequate and competent personnel or in the selection and obtaining of the best equipment available. As a result the hospital is considered one of the finest industrial medical units of its kind in the country.

The medical staff consists of seven doctors and 48 nurses, some of whom are on duty during each of the 24 hours that the plant is in operation.



TO protect the health of employes was the fundamental reason for founding the R.O.P. laundry.

Staffed by 24 persons, the laundry, working two shifts a day, washes approximately 10,000 uniforms, 1,500 pairs of gloves and 1,800 towels each day. Thousands of buttons are sewed on uniforms each month. Several hundred worn uniforms are repaired and darned by the laundry staff each month.

Life Insurance

YOUR Company has arranged with the Equitable Life Assurance Company of the United States to offer group insurance, at the lowest possible cost, to all Atlas full-time employes who desire "additional" insurance.

When an employe is promoted to a higher paying occupation, his insurance is automatically increased in accordance with the table shown below:

$1500 and under	$1,000	$ .60
$1501-2000	$1,500	$ .90
$2001-3000	$2,000	$1.20
$3001-4000	$3,000	$1.80
$4001-5000	$4,000	$2.40
$5001-7500	$5,000	$3.00
$7501-and over	$10,000	$6.00



NINETEEN hundred of 2,304 requests for transportation have been filled since the inception of the Share-the-Ride Bureau on October 1.

In addition to supplying daily passengers for drivers and rides for passengers, a "week-end" service is being conducted to provide rides to locations in Pennsylvania, West Virginia, Michigan and points in southeastern Ohio.

Starting with an average passenger capacity per car of 2.1, the Bureau has now raised the average to 4.0.

The Bureau, managed by S. L. Falls, is open daily from 8 a.m. to 4:30 p.m. and may be reached by telephone 497.

Plant Magazine

SINCE July 1, 1942, employes of R.O.P. have had a Plant Publication. Its purpose is to serve R.O.P. employes and their families by keeping them as well informed as possible of plant activities. Feature stories on the various departments and areas of the Plant provide employes a well-rounded education on R.O.P. as an integral unit.

Stories on safety, men in the service, Joint Production Committees, sports, contests, campaigns and programs; news of department activities, births, marriages, deaths and enlistments all form the nucleus of the magazine.

Copies are distributed free to all employes of the Ravenna Ordnance Plant, and to former employes in the armed services who request them.



FACILITIES to travel to and from the Plant by bus has been arranged by the Transportation Department in conjunction with officials of the Penn-Ohio Coach Lines, Hawk Bus Line and the Arsenal Transit Company.

Bus service is being maintained from Salem, Lisbon, Youngstown, Akron, Alliance and intermediate points.

Their schedules are adhered to every day excepting Sundays and Holidays to accommodate each shift.

(Continued on page 18)



Congratulations to **Adelle Beard** and **Inez McGrew**—both the proud possessors of new diamond rings. Adelle is engaged to **James Cline** and Inez is the future **Mrs. Bill Furtch.**

* * *

H. D. Mullett has replaced **E. T. Newcomb** as Dispatcher for the Fuze and Booster Area.

* * *

Ruth Moore, Madeline Tuttle, and **Izetta Rogers,** Material Sorters in Building 813, received "thank you" notes for their contributions to the "Cigarettes for Yanks Day," from boys in the Middle East, India, and Burma.

* * *

Don Menough has been made head of the Central Accounting Records section of the Department, which has been set up in the Old Guard House.

We would like to express our sympathy to **V. L. Coffman,** Dispatchor, upon the death of his mother, in December.

At a party held by the Inspection Section, **"Dud" Shelar** received three boxes of Corn Flakes; **John Bayluk,** a powder puff; **Ed Ingram,** box of blocks, and **"Gus" Gustafson,** mistletoe.

* * *

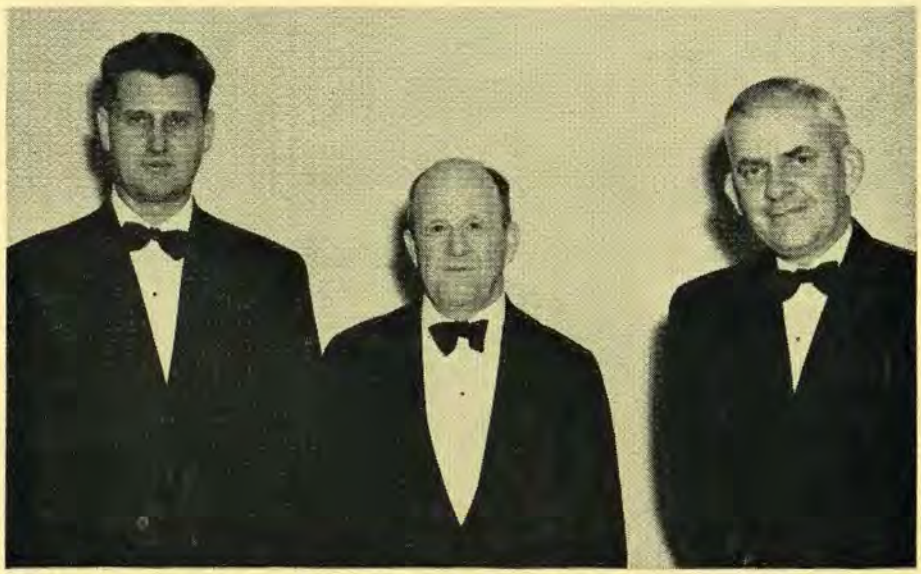
Celebrating birthdays during the last month were: **D. R. Phillips, Anne Chegas, Theresa Griner,** and **C. E. Dewyer.**

* * *

Bessie Hayes, since her induction into the Naval Reserve, is busy trying to convert all "W.O.W.'s" into "W.A.V.E.'s."

* * *

Herman Guffey was honored at a gathering of the Administration Building staff, before leaving for Texas and the Army Air Corps. Herman came to R.O.P. in June, '41, and since that time has made many friends. We hate to see him go but feel sure that he will "keep 'em flying."



J. T. Power, General Manager, presented gold watches to H. B. Palmer, Plant Accountant and L. E. Anderson, Production Superintendent of the Load Lines, at a recent gathering of the executive staff. Palmer, left, and Anderson, right, have completed 25 years service with the Atlas Powder Co.



During the last few days the Plant Engineering Department lost some of their "old timers" when **Fred Clark, C. A. "Chuck" Masek,** veteran water plant operator, and **John M. Bechdel,** locksmith, left R.O.P.

* * *

Frank McNab is back on the job after a few weeks' illness. Glad to see you back, Frank.

* * *

"Al" Fretter won the "John Harsh" trophy at the championship handicap shoot of Northwestern Ohio, held recently at Dover Gun Club.

* * *

Lorena M. Bonardi, timekeeper, has announced her engagement to **Roy E. Boyle.**

* * *

Helen L. Phillips is planning to middle-aisle it with **Ernest Miller.**

* * *

The "Ohio River Twins," **Ann Shught** and **Margaret Zuck,** Press Shop, are working on an invention to mark the detonator caps in such a way that if one lands in Der Fuehrer's face they can be told about it. Just keep sending 'em out gals—one will get there some of these days!

Todd Named Commander Of R.O.P. Legion Post

J. W. Todd was elected Commander for 1943 of Post No. 267 of the American Legion at an election meeting held January 5.

Other officers elected were: E. C. Weyrich, First Vice Commander; Harlan Moats, Second Vice Commander; Robert Rutkofsky, Adjutant; Gustave Gustavason, Chaplain; William Hedrick, Service Officer; R. Holt, Sergeant at Arms.

Commander Todd has appointed committees for membership, legislature, entertainment, and publicity, which are mapping out the program for 1943.

The picture, "Ohio Soldiers", showing the activities and training of soldiers from this district, will be shown at the next meeting.

Regular meetings will be held at 6:30 p. m. on the first and third Tuesday of each month in the Training School Building in the new Administration area.



SPORT SHORTS

By Joe Bassett



Varsity Basketball

The R.O.P. Varsity defeated the Salem Celtics in their first game of the year, by a score of 35 to 32.

Dick Henderson scored almost half of the team's points when he garnered 16 counters in a close game. McGaffick, with 10 points, was high point man for the opponents.

Intramural Basketball

The R.O.P. Intramural Basketball League for Ravenna, got under way last week with the Industrial Relations team defeating the Transportation outfit 31 to 25, and Load Line 1, CB 10 defeating Load Line 3, 27 to 21.

The Industrial Relations outfit, led by Andy Burkle who slipped 16 points through the hoop, looked better as the game progressed, and showed promise of making the going tough for the entire league. Pippen, Gosnell, and Delone looked good for the losers.

Senwine scored 13 points for the winning Load Line 1 CB-10 team in a close battle with Load Line 3. Kennedy and Price led the scoring for the losers.

Eight teams will compete in the R.O.P. Ravenna league this season. The teams representing various departments are: Load Line 1, CB-4; Area 8; Load Line 3; Load Line 1, CB-10; Control Laboratory; War Department; Industrial Relations; Transportation. All games will be played at the Ravenna USO Center.

The organization for a Newton Falls league is under way and will start as soon as facilities are available.

Bowling Standings

Administrative League
(Second Half)

	W	L
Legal	5	1
Financial	4	2
Cost	3	3
Paymasters	3	3
Payroll	3	3
Transportation	3	3
Administrative	2	4
Material Control	1	5

High Average: France, 166

R.O.P. League, Newton Falls (Men)

	W	L
Load Line 3, EB-13	16	2
Tool Shop 10	16	5
Linemen	15	6
Tool Shop 9	14	7
Firemen	11	10
Booster 1	5	16

High score: George May, 222.

R.O.P. Thursday League, Ravenna

	W	L
War Department	12	0
Typewriter Shop	9	3
Load Line 3	6	6
Paint Shop	2	7
TNT Load Line 1	1	8
Maintenance	0	6

High average: Boston, 202.

R.O.P. Ladies' Thursday League
Ravenna

	W	L
Purchasing	22	8
Industrial Relations	18	12
Plant Engineering	19	14
Mail Girls	12	9
Industrial Relations II	13	20

High average: O. Anderson, 133
High individual: L. Lamkin, 185

R.O.P. Ladies' Friday League, Ravenna

	W	L
Detonator	25	5
Stenographic and File II	21	9
Control Laboratory	14	10
Load Line 1	3	6
Stenographic and File 1	11	18

High average: Clouse, 125
High individual: E. Masirovits, 164

Paymasters Win First Half Bowling Title

THE Paymasters walked away with the first half title in the Administration Bowling League, when they finished the first half of the schedule with a large six game lead on their nearest rival.

Led by C. T. McGarry, who is currently ranking second in high averages, the team rolled merrily along piling up 29 wins and only 13 losses.

The Administrative team and Cost Department were deadlocked for second place with 23 wins and 19 defeats, only a one-game advantage over the Transportation outfit.

Interest runs high in this league and the competition is very keen. The Legal Department, cellar-holders in the first half, are leading the league so far in the second half.

Although Taylor Maxwell will not readily admit it, the Paymasters were taken to the cleaners, two out of three, in a recent tussel with the Lawmakers.

High individual averages for the first half included the following: R. France 167, C. McGarry 164, D. Rafferty 164, J. Graves 164, L. Peck 163, D. Davis 162, P. Cipriano 162, and F. Sancic 161.

High individual three-game series scores are headed by J. Graves with a 605 series. D. Rafferty had a 591 series and D. Davis posted 589.

High team single game scores finds Material Control in the lead with 926 pins. Payroll ranks second with a game of 919 followed by Cost Department with 906 pins.

High team three game series is headed by Material Control with a 2476 series. Second spot is held by Administrative with 2443 pins. Paymasters ranked third with 2419.

Final First Half Standings

	W	L
Paymasters	29	13
Administrative	23	19
Cost	23	19
Transportation	22	20
Material Control	20	22
Payroll	19	23
Financial	19	23
Legal	13	29

LOAD Lines



The following letter received by **Miss Phoebe Morgan,** a line operator on Load Line 1, from **Sgt. Victor B. Cantin** a former operator on the Load Lines, should be very gratifying to all who participated in the "Cigarettes For Yanks" drive.

Presque Isle, Maine

Dear Friend:

I received a package of cigarettes yesterday with your name on the band around them and wishing to extend my thanks. I am addressing this personally to you hoping that you will get this.

We at this Post are in active service, but we are pretty well isolated and to find that the people back home are behind us in the small things is very helpful to our morale and in the belief that we are fighting for the right things.

Wishing you a happy and joyful season greetings, I am

Your Sincerely,

Victor B. Cantin

A similar letter was received from **D. Ernest** of the Pilot Ferry Command located at North Africa. **Ernest** is also a former Load Line worker.

* * *

We should all take a lesson from **Miss Frances A. Coz,** a line operator on Load Line 1, employed on December 23, 1941. She has never been absent from work.

Congratulations Miss Coz! We would like to hear of more records such as hers.—(Ed.)

First Baby For '43

The first baby to be born in Ravenna, in 1943, was the son of Mr. and Mrs. Tommy Reagan. Reagan is Assistant Foreman in CB-13, Load Line 1. The baby got off to a good start when the gang in CB-13 gave him a $15 savings account.

Misunderstanding Exists On Hospital Facilities

Considerable misunderstanding now exists among our employes relative to the hospital facilities on the plant property.

The Plant Hospital was originally designed and erected to handle only occupational injuries and diseases. It is only in the event of an extreme emergency that the hospital can be made available for non-occupational injuries.

When such an emergency exists, it is necessary to bill the employe the customary charges for all services rendered.

Medical

Mrs. Eugenia Manley has been made Dispensary Supervisor to replace **Miss Betty Whitskey,** who is leaving to return to her home in Philadelphia.

* * *

Mrs. Fran Ross, Jr., has joined her husband, who is stationed in Hollywood.

* * *

Mary Helcamp is sporting an engagement ring. The lucky fellow is **Edward Young** who is in Midshipman's Training.

* * *

Margaret Schulte knitted a sweater for a soldier boy. The recipient turned out to be a handsome six foot two Ravenna lad.

Control Laboratory

Helen Perry, Chemist, and 1941 Olympic Swimming Star, has enlisted in the WAVES. Good luck, Helen.

Our sympathy is extended to Morris Gallant on the death of his father in New York City, on December 15.



There is a great deal of talk about rationing **Patrolman L. E. McKinney.** As things are at present, he is a member of three committees, Joint Production, Employes' Adjustment and R.O.P. Guards' Benefit Funds. In addition McKinney, a former Captain in the Army Signal Corps, seems to find time to serve on entertainment committees and win $25 War Bonds for suggestions.

* * *

Company "B" held a gala New Years party at the Moose Hall in Warren. Guests of honor were **Chief and Mrs. G. W. Conelly, Capt.** and **Mrs. G. R. Hopkins, C. H. Williston, Lieut.** and **Mrs. T. T. Brown, Lieut.** and **Mrs. F. A. Wolfe, Lieut.** and **Mrs. H. T. Miller,** and **Mr.** and **Mrs. W. H. Salladay.**

Chief Conelly was toastmaster and short speeches were given by **Captain Hopkins** and **C. H. Williston.**

The party was planned by **Corp. G. A. Busch,** and **Patrolmen S. R. Lanyon, W. C. Wilson** and **C. H. McAdoo.**

* * *

The Department welcomes the following new members: **G. R. Allman, D. D. Corrich, A. C. DeLeone, B. F. Edwards, R. A. Evans, J. C. Fiber, W. A. Gramlich, J. K. Henize, A. J. Kayda, C. M. Kennedy, C. H. Legg, J. E. Meisenhelder, A. E. Pearson, C. R. Stibitz, V. W. Stone, G. W. Whitehead.**

* * *

Recent promotions in the department include **W. G. Zimmerman** to sergeant, and **M. E. Cole, J. E. Pricer** and **P. G. Thornhill** to corporals.

JARRETT NAMES ANNE KETARA R.O.P.'s "W.O.W." GIRL

LOVELY Anne Ketara, of Fuze Line 2, today reigns as "W.O.W." girl of the Ravenna Ordnance Plant.

Art Jarrett, famed orchestra leader, chose Miss Ketara from a group of ten hostesses at a Holiday Hop, held at Stambaugh Auditorium, Youngstown, on December 30.

The ten candidates for the title paraded the length of the auditorium just before the presentation ceremonies, with the audience still not knowing who the winner would be. Miss Ketara was the last to enter and was announced as the winner.

Miss Ketara was taken to the bandstand and presented flowers and loving cup, by L. R. Brice, president of the R.O.P. Recreation Association.

Following presentation to the assembled, Art Jarrett introduced Miss Ketara to the radio audience over station WFMJ, Youngstown.

Remainder of the candidates, who acted as hostesses during the dance, included Margaret Sovik of Fuze Line 1, Evelyn Moore of Booster Line 1, Doris Miller of Booster Line 2, Stephanie Sharec of Load Line 1, Anne Wishnelski of the Artillery Primer Line, Mary McGarry of the Percussion Element Line, Martha Opatick of the Detonator Line, Irene Kingsbury of the War Department, and Josephine Spahn of the Administration Department.

Candidates for the title were chosen by two elections in each Department. The first election was to select a candidate to represent each shift, whereas the final election named the young lady who would serve as hostess at the dance and be a candidate for the "W.O.W." Girl toga.

Pictures of the final ten were given Art Jarrett, who selected Miss Ketara for the title.

Miss Ketara, who lives in Struthers, Ohio, has worked at the plant since April 1, 1942. She works as a "reject girl" in Fuze Line 2.

The Hop was sponsored by the Plant's Recreation Association. Ralph G. Ross, of the Fuze Lines, was General Chairman.

One Minute Biography of R.O.P.'s "W.O.W." Girl

Name ..... **Miss Anne Ketara**
Address ..... **Struthers, Ohio**
Height ..... **Five feet six inches**
Weight ..... **145 pounds**
War Occupation .....
Line Operator, Fuze Line 2
Peacetime Occupation .....
Beauty Operator
Birthplace ..... **Monongahela, Pa.**
Hobbies .....
Skating, dancing, basketball



Miss Ketara beamed happily at Ralph G. Ross, chairman of the Holiday Hop, after being named R.O.P.'s "W.O.W." Girl.



Art Jarrett who played for the hop, presented Miss Ketara to the radio audience over radio station WFMJ, Youngstown.



RIGHT—Leonard Brice presented a loving cup to Miss Ketara. Hostesses Anne Wishnelski, Evelyn Moore, Irene Kingsbury, Martha Opatick and Margaret Sovik, and Escorts E. J. Luerich, Russell Armitage and H. A. Anderson, are shown left to right.

LEFT — Jarrett interviewed hostesses, prior to the dance, in the studios of WFMJ, Youngstown. Left to right are Josephine Spahn, Margaret Sovik, Anne Wishnelski, Irene Kingsbury, Mary McGarry, Art Jarrett, Evelyn Moore, Martha Opatick, Anne Ketara, Doris Miller and Stephanie Sharec.



FUZE and BOOSTER

Our challenge to equal a record of one family's representation in the U. S. forces has been answered! And on our own line. **Marcella Boyle,** Fuze Line 1, can equal **Margaret Lazaris'** record. Marcella has five brothers in the service, and another brother is to enter sometime in January.

Fuze and Booster seems to have this record all to themselves. How about some of you other departments taking a look.—(Ed.)

Sympathy is extended to the Cameron family on the recent death of Mrs. Clara Cameron, of Booster Line 1.

Corp. William Allen, visited former associates on the Booster Lines while on a furlough.

* * *

We all wish **Ivah Doing,** Booster Line 2, who is in Warren City Hospital with a fractured ankle, a speedy recovery!

* * *

Exchanges were held recently in Change House 36 by the four lines in Building 11, Fuze Line, honoring their foreladies, **Gwen Peake, Betty Woods, Betty Davidson, Van Essa Gee** and **Vivian Cole.**

Sympathy is extended to William Dixon, whose sister passed away on December 20.

Plant Accounting

Evelyn Masirovitz is thanking the Santa Claus of Fort Knox who brought her a sparkler for Christmas.

* * *

Kathleen Baumberger of Materials Accounting is stealing shy glances these days at the picture she recently received of her favorite bluejacket.

Members of the Department express their sympathy to the family of Joseph Fritz, of Property Division, who passed away recently.

Bob France recently welcomed home his son, **Jerry,** returning after a long siege in a Cleveland hospital.

* * *

Audrey Teits resigned from the Invoice Section on the 16th, to build airplanes on the West Coast. **Gladys Breth, Jane Tucker, Alta Eidenire, Judy Beck,** and **Kathleen Baumberger** gave a dinner party in her honor, January 12, in Akron.



FINANCIAL

Newcomers: **Harriet Coffin, William P. O'Brien, John C. Watts, Jean Griffiths, Isabelle Farres,** all of the Auditing Division. **Margaret Stano,** Payroll and Tabulating.

* * *

Terminations: **Dorothy Sentman, Dale Rafferty, Rose Bertilacci, Helen M. Knisely, Frances Mason** and **Betty Newman.**

* * *

Ask **Eloise Prudner** and **Nellie Chatan** what they were thinking about while hiking from Warren to the Plant during a recent snowstorm.

Procurement

Welcome to **Leonard Hirschman,** just transferred from Production Control. He is fast developing into a PRP sleight of hand artist.

Don't you know what PRP is? It stands for Production Requirements Plan. It's a cute little rationing scheme invented by the War Production Board. You'd better learn to like it, because it's the spinach in your diet.

* * *

Roger Buettell is beginning to wonder whether he's in the purchasing end of this business, or the tire and mileage rationing end.

"Give a man a horse he can ride" is the slogan of the Protection Department since the arrival of the horses which will be used for the new Mounted Patrol. Shown below are two scenes at the stables in the George Road barns. At left is Dick Thomas looking over the saddles. Shown at right is Corporal Phelps, holding "Captain" and "Buddy," two of the excellent horses at the barns, that are being groomed for early service.





TRANSPORTATION



We're sticking our chest out a wee bit these days! **R. G. Shultzman** has lost one son in action, has four sons in the Service, two sons in war industries, and a sister-in-law who is a stenographer in the Transportation Building. That looks pretty hard to beat!

College Men Hired For Weekend Work

During the Christmas and New Year school vacation, approximately 45 Kent State University faculty members and students were employed in the Lumber and Dunnage Yard at Old C.B.S. They will continue their employment over weekends. We consider this quite a contribution to the war effort.

Appreciation is extended to employes of Old C.B.S. for perfecting the machine that is now used in pulling nails from the salvaged lumber.

* * *

Railroad Section Foreman, **John W. Kemp,** is off duty due to illness. We wish for his early recovery.

* * *

What happened to the rabbit that jumped up at the feet of **Supervisor Keggan's** dog, while hunting with **Chief Clerk Tracey?** The dog is safe—so is the rabbit! * * *

Our most popular employe in the Track and Dunnage Division is **Nancy Mrmosh.** We want to compliment her on not losing a day since her employment in May.

* * *

Mrs. Pauline DeUnger, Main Service Garage, left recently to join her husband, **Roland,** formerly of the War Department, now at Aberdeen Proving Ground, Baltimore, Md. **Roland** is being trained in the Ordnance Division. Good luck, **Pauline.**

* * *

Stations and Freight Office has been moved from Old Atlas Building to the Old Guard House, Paris-Windham Gate.

Ode To Selective Service

I remember 'twas only some ten months ago
That they classified me in 1-A,
And a couple of wise guys came down for a laugh
When a corporal marched me away.

I had hardly been gone from my home town a week
When that son-of-a-gun in 3-A
Took over my job at the vinegar works
(Only he got just double my pay).

And almost as soon as my troop train pulled out,
That flat-footed guy in 1-B
Started running around with a girl friend at home,
Who had promised to stay true to me.

But justice is justice, each dog has his day;
And those guys in 3-A and 1-B
Were reclassified so that they now drill all day
And cuss at their sergeant—
THAT'S ME!

Pvt. Gimlet Grogan,
Camp Wolters, Texas.

WEDDINGS

Plant Engineering

Jane Moore to George Cos
Carmel Baiss to Corp. Joseph Carbone, January 1
Margaret Lansinger to Bernard Paul, December 26.

Fuze and Booster

Bernice Barber to Loren Saam, December 25
Edna Higgens to Frank Schonce, December 5
Esther Staley to Robert Evans
Helen Broumas to Peter Comminos, January 10

Medical

Doris Morris to Dave Reutter, January 9

Load Lines

A. Stewart to Freda Eller, January 9

Industrial Relations

Elma Louise Watt to Clarence Penman, December 23
Ruth Daniels to Corp. Levi Adair, December 24
Margaret Lansinger to Bernard Paul, December 26

Purchasing

Pat Stanley to Jack Hepplewhite

BIRTHS

Plant Accounting

To Mr. and Mrs. Roy Alexander Jr., a girl, January 12

Transportation

To Mr. and Mrs. G. E. Griggy, a girl, Nancy, January 7

Planning and Production Control

To Mr. and Mrs. P. F. Chappelear, a boy, December 7

Fuze and Booster

To Mr. and Mrs. Susinka, a boy
To Mr. and Mrs. Ramsey, a girl

Protection Department

To Lieutenant and Mrs. M. A. Lamson, a boy

Load Lines

To Mr. and Mrs. V. Andrews, a boy, Donald, December 30
To Mr. and Mrs. W. Lester, a girl, Shirley Ann, January 4
To Mr. and Mrs. L. Egerer, a girl, December 26
To Mr. and Mrs. R. Pierce, a boy, January 1
To Mr. and Mrs. V. W. Randall, a boy, John Russell, December 30

Industrial Relations

To Mr. and Mrs. T. Wayne Jones, a boy

Purchasing

To Mr. and Mrs. Edward Fritz, a boy

PERSONNEL CHANGES

Transportation

E. D. Manson from Stations and Freight Office to Main Service Garage
Bertha Shultz, Timekeeper, from Track and Transfer to Stations and Freight
E. C. Cameron from Railroad to Planning
O. Hardway, from Railroad to Planning

Planning and Production Control

L. J. Hirschman, Planning to Purchasing

Financial Accounting

Jean Anderson, Group Insurance section to Load Lines

Industrial Relations

H. R. Daniels, Jr., from Personnel Department to Building Supervisor, Load Line 1
Arlyn Foust from Recreation to Training Division
Marion Floyd from Fuze Line 2 to Recreations
Dorothy Barlow from Record Section to Dark Room

Plant Accounting

Vida Duma, from Booster 2 to Plant Accounting
Jeannette Feeley from Booster 2 to Plant Accounting
Alberta Hersman from Booster 2 to Plant Accounting
Anne Valentic from Stationery to Stenographic
Martha Peck from secretary to supervisor of Stenographic, Files and Mail Room
Irving Margolies, from Commissary to Inventory Audit
Elsie Travis from Telephone and Telegraph to Protection
Maida Richer from Telephone and Telegraph to Protection
Mary C. Joseph from Telephone and Telegraph to Protection
Pauline C. Jones, from Telephone and Telegraph to Protection
Elsie Ogden from Telephone and Telegraph to Protection
Dolores Humbla from Stationery to Stenographic
R. Irene Willing from Stationary to Stenographic
Ruth Graves from Stationary to Protection
Eleaner Alexander from Stationary to Executive

(Continued on Page 18)

Safety Comes First

The 'WHYS' Of Safety

A comprehensive safety organization has been set up for the protection of the worker here at R.O.P., because SAFETY COMES FIRST.

This protective system is based on a combination of the best and most practical methods for the prevention of accidents of all kinds.

At times questions arise, pertaining to the welfare of the employe which perplex those not directly connected with safety. These perplexities develop into the questioning of safety rules. The best way to support safety rules, the best way to make them understandable to the workers, is to cite the consequences of violation of those safety rules.

For example, the question of wearing safety equipment often arises. Why do we have to wear goggles, face masks, respirators or powder shoes? It is admitted that all of them are uncomfortable at times, but if one accepts a job, he also accepts the unavoidable hazards that go with it.

There is only one way to avoid these hazards, and that is to use safety equipment designed and tested to overcome the hazard.

Safety protection devices are a part of the operation, and have become that part because a thorough study has been made of the hazard, and it is for YOUR PROTECTION that the safety features have been added. It is your job to protect yourself with the best safety devices available, and protect your fellow workers as well. Remember that SAFETY COMES FIRST.

Safety Record

From Nov. 8 to Dec. 5, 1942

Man hours worked	2,103,259
Lost time accidents	9
Accident per million man hours	4.56
Days lost per 1000 man hours worked	.110

Face Mask Saves Picatinny Worker

A WORKER'S life was saved at Picatinny Arsenal because he obeyed the safety rules, according to the Picatinny News.

The worker was mixing a batch of detonator ingredients when the container blew up. Frightful burns and probably death would have resulted had he not been wearing an acid nitrometer face mask as required by safety regulations.

As it was, he sustained a cut on his chin where the aluminum frame of the mask was driven against his face. His chest, though protected by a flame-resistant bib, was slightly burned and peppered with hot particles. The plant now directs that lead azide be weighed and dumped behind a steel barricade.

The mask had an aluminum frame, clear cellulose acetate window seven by nine inches, with adjustable full head gear. After the accident the arsenal added a padded chin protector to this type of mask in order to prevent or lessen impact in event of explosion or flash.

Conditions similar to the one above are prevalent here at Ravenna. It is your job and your fellow workers' job, to remember these things, and to profit by the experience of others and carry on our campaign to use our safety equipment. You must remember that all safety equipment has been developed because of previous accidents, and has been developed to prevent injury to you. You can take the hazard out of a hazardous job, by correct application of the safety rules.

All employes at R.O.P. receive a "Safety Manual" upon being employed. This manual plus the yellow poster found on the walls of all operating bays is your guide in being a safe explosive operator.

READ YOUR

"Safety Manual"





The following of the safety rules, with the use of provided safety equipment and good common horse sense, will place and keep our plant a safe place to work. We're doing a good job now . . . but let's do a better one.

Let's all start a "Smash the 7th Column" campaign, and lick old man carelessness. Let's make sure that we do it the right way . . . and that our fellow workers do it the right way too. We Fight When We Produce . . . SAFELY.



By G. P. Teel, Executive Secretary
Joint Production Committees

MANIFESTING ever increasing interest in the Joint Production Committee, R.O.P. employes are submitting a heavy volume of suggestions. There has been a substantial increase in the total number submitted monthly, while the average quality of all ideas received has improved notably.

During the three months ending Dec. 31, a total of 1493 suggestions were submitted. One hundred and two of these ideas were voted awards, these representing 92 individual employes. Two of the successful ideas were submitted anonymously and the suggestors have as yet failed to identify themselves.

Many of these ideas have been placed in practice, others are in process of execution. Thus an ever increasing number of employes have experienced the personal satisfaction of not only being recognized and rewarded for constructive thinking, but also are seeing their ideas at work.

The Policy and Award Committee met on January 14 to judge suggestions accepted up to December 31. Thirty-one awards, of which 24 were monetary, were made at this meeting.

An additional Joint Production Committee is being organized on the Percussion Element Line.

Three new members joined the Policy and Award Committee at the January meeting. Miss Mary Socash, Fuze Line 1, succeeded Miss Leona Twitchell; T. J. Markle, Plant Engineering Department, succeeded C. D. McMillin; Anthony Santone, Load Line 3, replaced L. Hetrick.

The three retiring members had rendered noteworthy service and were truly representative of the splendid type of R.O.P. employes.

Demonstrating their broad scope of activities, the Joint Production Committees sponsored the annual appeal for funds in the Infantile Paralysis Campaign.

Winners of $25 War Savings Bonds



Above—**George Shavers,** Badge 3707, Transportation Department, suggested using a "solid" lamp for Load Line Railroad switches, to minimize breakage and reduce cost of replacements.

Below—**Frank C. Yehl,** Badge 6485, Booster Line 1, suggested a new assembly to be used in the detonator sensitivity test. This device was adopted promptly and will eliminate a hazard and is a definite improvement.





Above—**L. W. Cummins,** Badge 729, Transportation Department, suggested a destination card holder to be placed on railroad cars. This is a definite improvement over the present methods.

Winners of $10 War Savings Stamps

Name	Badge No.	Department	Number	Suggestion Classification
L. Neitz	1804	Load Line 1	7203	Conservation
Alice K. Owens	8655	Artillery Primer	3300	Safety
Florence Litman	20384	Transportation	2572	Welfare
John A. Whalen	1064	Plant Engineering	10354	Safety
(Willard Mock	2499	Load Line 1	4303	Safety
John Carlariello)	8480	Load Line 1	4303	Safety)

Winning $5 in War Savings Stamps

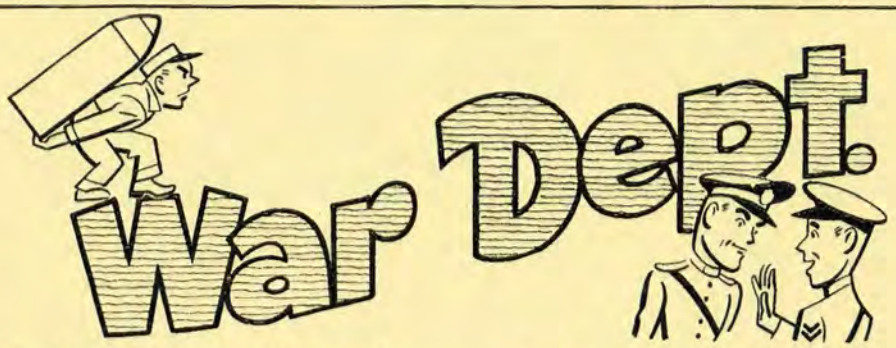
Name	Badge No.	Department	Number	Suggestion Classification
Alfred J. Jacobsen	13128	Fuze Line 2	14552	Welfare
Alfred J. Jacobsen	13128	Fuze Line 2	7815	Safety
Helen Skubish	12839	Fuze Line 2	7823	Welfare
Isabel Hernan	9337	Detonator Line	9219	Production
M. C. Rush	14728	Commissary	4079	Safety
Bernard K. Meyers	21491	Transportation	5643	Safety
J. H. Jeffrey, Jr.	3364	Transportation	2515	Transportation
Thomas M. Spears	2668	Transportation	2668	Safety
Edward L. Kennedy	12498	Transportation	2537	Transportation
W. R. Holtrey	8533	Transportation	2708	Safety
I. W. Chess	1374	Transportation	6825	Safety
Williard W. Lee	7153	Load Line 2	4065	Safety
J. J. Dukeman	5564	Load Line 3	12110	Production
Genevieve Goldberg	18363	Fuze Line 1	7757	Production
Genevieve Goldberg	18363	Fuze Line 1	7760	Safety
Franklin Hughes	10265	Load Line 1	724	Production

Honorable Mention

Name	Badge No.	Department	Number	Suggestion Classification
R. W. Taylor	3214	Load Line 3	6515	Production
Kenneth Decker	2834	Load Line 2	608	Safety
Thomas Jones	11692	Load Line 3	12122	Welfare
G. A. Anthony	6110	Load Line 3	6638	Safety
A. A. Orinski	354	Protection	2786	Welfare
H. S. Gruver	3984	Transportation	10221	Welfare
A. B. Cegan	5712	Plant Accounting	4302	Welfare

Presentation date of above awards will be announced later

We Fight When We Produce!



Col. John K. Clement Succeeds Colonel Franklin As Commandant

COL. JOHN K. CLEMENT succeeds Col. G. K. Franklin as Commanding Officer. Colonel Clement is being transferred from the Letterkenny Ordnance Depot in Chambersbury, Pa., and Colonel Franklin will go to San Antonio Ordnance Center, San Antonio, Texas.

Colonel Clement was born in Pennsylvania in November of 1880. He received a B. S. degree from Trinity College in 1900 and a Ph.D. from the Universtiy of Goettingen, Germany, in 1904.

The officer began his career as an Ensign in the Navy Militia in 1906, and then became a First Lieutenant in the infantry of the Pennsylvania National Guard in 1909. He was promoted to a Captain in 1910 and a major in 1916.

In 1917, he was commissioned a Major in the Ordnance Section, Officers' Reserve Corps, of the U. S. Army, and was promoted to Lieutenant Colonel in the Ordnance Department in 1918.

After the war, he was recommissioned a Major in 1920 and became a Lieutenant Colonel in 1935. In 1939 he was made a Colonel.

Personals . . .

Pvt. Howard Grohe, formerly of the Time and Payroll Division, is now stationed at Aberdeen Proving Grounds, Md.

* * *

Rita Hesidence, Plant Headquarters, is back to work after being out a week recuperating from an accident.

* * *

Laura Brown, Plant Security Division, and **June Croxton,** Personnel Division, have returned to work after a week's illness.

The following "gals" have announced their engagements. **Jane Hoerbelt,** Inspection Division to Thomas F. Lee of the Navy; **Mary Yursega,** Inspection Division to Lieut. Michael Rohach of the Army; **Lois Bowen,** Safety Division, to Frederick Gombert; and **Verna Santoro,** Mail and Records Section, to Charles Armbruster.

Vital Statistics . . .

OFFICER PERSONNEL CHANGES

Lieut. Eugene C. Barbero, Adjutant, to Tank Maintenance School, Rock Island Arsenal

Lieut. Wayne H. Kuhn, Production Control to Inspection (Ass't. Army Inspector of Ordnance.)

Capt. G. Ross Hopkins, Public Relations Officer, to Iowa Ordnance Plant, Burlington, Iowa

Lieut. J. M. Fletcher, Production Control Division, to Coosa River Ordnance Plant, Talladego, Alabama

Col. G. K. Franklin, Commanding Officer to San Antonio Ordnance Center, San Antonio, Texas

PERSONNEL CHANGES

Barbara Jacobs, Inspection Division to Planning Division

Bill Frasher, appointed Chief of Time Inspectors

Mary Perusech, Property Division, to Goodyear Aircraft Corp.

Edith Brydle, Property Division, to Mail and Records Section.

Margery Brown, Administrative Office, to Plant Headquarters

Marguerite Dickey, Administrative Office to Civil Aeronautics Administration, Alliance, O.

Mimi Horning, Payroll Division to Navy Dept., Kent, Ohio

Gale Young, Production Control to Time and Payroll Division

Jeanne Brendle, Production Control to Time and Payroll Division

ENLISTMENTS

J. M. Katzman, Inspection Division, Army

J. K. Kester, Inspection Division, Navy

Virginia Willis, Invoice Section, S.P.A.R.'s

Rose Wyko, Property Division, W.A.A.C.'s

J. J. Simpkinson, Inspection Division, W.A.A.C.'s

Russ Armitage, Inspection Division, Army Air Corps

Samuel Ehrenberg, Production Control, Marines

BIRTHS

To Mr. and Mrs. J. E. McGovern, a girl, Sandra Marie, December 16.

To Mr. and Mrs. Carl Schnell, a boy, David Paul, December 27



Col. G. K. Franklin is shown as he congratulated workers of the War Department, after he had presented them with gold bars and Certificates of Merit in honor of their second year of service. Employes being congratulated are, left to right: Jack Taylor, Vesta Bee, Kathryn Moses, and C. R. Kennington.



This inaugurates a new page that will be a regular feature each month. We hope that it will help to keep everyone informed on the progress of their friends who are now in the armed forces. We will sincerely appreciate contributions concerning news of former R.O.P. employees who are now fighting for Uncle Sam. —(Ed.)

THE "Cigarettes for Yanks" campaign continues to look more successful every day. Many R.O.P. employes have received "thank you" notes from the boys overseas. More campaigns of this type are in order, for they really will help to keep up the morale of the boys "over there."

* * *

Al Bast, former interviewer, writes from camp, telling us that Fort Snelling, Minn. is really selling bonds. A total of 99.9 per cent of the boys have signed for War Bonds, and the average deduction is 18.9 per cent. That's a record for R.O.P. to shoot at. He was the ranking bond seller of R.O.P. interviewers while here.

* * *

Roger Burns, former employe of R.O.P. and son of C. J. Burns of the Transportation Department, wrote home saying "Keep them rolling there so we can keep them falling over here."

* * *

A recent visitor was Ensign Roger Frost, son of A. L. Frost, Director of Planning and Production Control. Roger, a former employe of R.O.P., recently received his commission.

* * *

Employes in the Track Division and Dunnage Yard were pleased to hear from Pvts. A. E. Rolinson, Robert Esworthy, John DiMauro, and Sgt. Arthur E. Tharp, all former employes. Addresses can be obtained in the Transportation Office, Administration Building.

Robert Rinearson of the U. S. Marines, who is home on a furlough after being injured during active duty in the Solomon's, is shown looking over a shell made at R.O.P. Looking on are, left, his brother Elmer Rinearson Jr., of Load Line 1, who joined the Marines January 19, and right, his father Elmer Rinearson Sr., who works in the Cost Accounting Department.

Third Bombardment Squadron (H)

Office of the Squadron Commander
SUBJECT: Acknowledgement of Gift
To: The Employes of the Ravenna Ordnance Plant, Apco, Ohio

The Officers and men of the 3rd Bombardment Squadron acknowledge with thanks your gift to us of two cases of cigarettes.

The tie that binds us of the fighting forces with you, our co-workers in this fight for the freedom that we all cherish, was never more forceably demonstrated than in this gift that we appreciate so much.

To you back in the States, we wish a Happy and Joyous New Year and may our united effort succeed in beating our common enemy in the not too far distant future.

Don A. Pomery Jr.,
Captain, Air Corps.
Commanding.

James H. Coe writes saying he has been receiving the "R.O.P." regularly. In accordance with our policy of sending copies to former employes now in the armed forces, upon request, Coe will continue to get each month's issue.



Pictured above is Lieut. Francis L. Dowdell, of the U. S. Army, who, seven months ago, was a Service Worker on the Detonator Line.

Promotion has been fast for Dowdell, who is home on a 10-day furlough. A former star athlete in Warren High and Wilburforce College, he started with R.O.P. in February, 1942. Within a month, he was promoted from Service Worker to a supervisory capacity.

Three months later, he was inducted into the army as a private. On January 14, he was commissioned a Second Lieutenant. Nice going . . . you've got what it takes!



Employe Services . . .

(Continued from page 6)

Within the Plant, 20-minute bus service to the various buildings and areas is maintained.

Employes who wish information on off-the-premise bus schedules, may call the Transportation Department on line 514 for further information. On inside bus schedules information may be obtained by calling the Motor Pool Dispatcher on line 472.

Public Library

R.O.P.'s Public Library, formerly located in the old Camp Site, is now located at the northeast corner of the Hospital, in the Administration Area.

The Library, open on Monday, Wednesday and Friday from 11:30 a. m. to 5 p. m. and on Tuesday, Thursday and Saturday from 8:30 a. m. to 5 p. m., is for use of R.O.P. employes and is well stocked with the latest popular newspapers, magazines, technical books and fiction.

Helen M. Hurd, librarian, has announced that in the eight months the library has been available, there have been 5,669 persons in attendance and 4,924 books circulated.



WITH the opening of the Ravenna Ordnance Plant came the need for housing employes who came from distances ranging from 50 to 250 miles.

This situation has been met through the coeperation of the Federal Public Housing Authority in the different localities, by the erection of housing units and dormitories listed below.

Name	Location	Units
Westlawn	Warren	250
East River	Newton Falls	350
Maple Grove	Windham	2,000*
Trailer Camp 1	Newton Falls	237
Trailer Camp 2	Newton Falls	113
Trailer Camp 3	Newton Falls	500*
Women's Dorms	Cotton Corner	457 Beds
Women's Dorms	R.O.P.	651 Beds
Men's Dorms	R.O.P.	474 Bers

*Not open at present. Under construction.

In addition, there are 67 houses on the reservation for persons whose duties require their presence 24 hours a day.

Homes Registration offices have been set up in Ravenna, Newton Falls and Warren as a subsidiary of the Plant Housing Division. There job is to list houses, furnished rooms and sleeping rooms for rent, which are accessable to our employes.

Applicants for dormitory rooms may apply directly to the dormitory office of F.P.H.A., or may call the Housing Division, the telephone of which is listed below.

The office offers a special service to employes relative to the control of evictions and rent ceilings affecting R.O.P. employes. The Division keeps in close touch with the Office of Defense Transportation for proper procedure which employes must follow if they wish to hire moving vans for transfer of household goods from distant points to locations adjacent to the Plant.

The Housing Division is located in the Industrial Relations Building in the Administration Area, Phone 509.

Communications

R.O.P.'s ability to keep in touch with the outside world rests in its excellent telephone, telegraph and mail service.

Anyone may send a telegram from the Ravenna Ordnance Plant by either Western Union or Postal Telegraph. The office, located in Room 102 of the Administration Building, never closes. Procedure for filing a telegram is the same as in commercial offices.

For the convenience of persons wishing to make long distance telephone calls, pay stations have been set up in the Administration Building, Guard House and Hospital. Efforts are being made to install similar pay stations in both men's and women's dormitories on the Reservation.

Post Office

POST OFFICE at the Ravenna Ordnance plant, located in the Administration building, has been appropriately named Apco, Ohio.

Lorand Lewis is postmaster. The office is open from 7 a. m. to 6 p. m. and handles all types of postal business. This includes the sale of stamps, War Bonds, money orders, etc. The office has been open since March 23, 1942.

Mail is sent from the Plant at 7 a. m., noon and 6 p. m. Morning and noon mail goes to Ravenna while night mail is dispatched directly to trains.

Vital Statistics

(Continued from page 13)

ENLISTMENTS

Transportation

John Sarsany, Army
John Wujcik, Navy
Bert A. Thomas, Navy
Verner G. Ward, Navy
Ernest Porter, Army
Dan Graves, Naval Air Force

Planning and Production Control

M. E. Wanstreet, Army
E. J. Ahern, Army
R. Gains, Army
W. F. Kernan, Army
J. H. Neilson, Army
E. Yarwood, Army
E. T. Newcomb, Army
W. C. Furtch, Army
R. S. Kloss, Navy
G. J. Lehman, Army
D. L. Robinson, Army
G. B. Towner, Jr., Army
G. R. Phelps, Army
H. F. Guffey, Army Air Corps
J. L. Pendleton, Naval Air Force
W. C. Kaser, Army
R. R. DeLong, Army
C. J. Hall, Army

Fuze and Booster

Janice Casto, W.A.A.C.
Kathleen Anderson, W.A.A.C.
Thelma Wiemer, W.A.A.C.
William Hawthorne, Army Air Corps
Frances Coburn, W.A.A.C.
Danny Shavers, Army
Vera Jackson, W.A.A.C.
Robert Delaney, Army Air Corps

Protection Department

J. E. Arnett, Army
E. W. Crum, Army
F. E. Juraz, Naval Air Force
S. B. Morgan, Army
R. R. Rottgen, Merchant Marine
R. E. Stockdale, Marines
L. A. Weaver, Army
H. B. Williamson, Marines

Plant Engineering

O. Perry House, Army
Max E. Fiess, Marines
E. Woodruff, Army
L. S. Saam, Army
A. E. Harris, Army Air Corps
E. P. Esposito, Army
M. E. Wagoner, Army
R. E. Dickey, Army
W. L. Kennedy, Navy Sea-Bees
P. J. Donahoe, Army
E. L. Engert, Army
J. R. Brown, Army Air Corps
Elton Stamm, Army
J. J. Dallas, Navy Sea-Bees
G. M. Cosgrove, Army
A. G. Flectner, Army
J. M Bechdel, Army
D. D. Hill, Army
F. W. Clark, Army

Load Lines

W. West, Army
W. R. Copley, Navy
W. Phipps, Army
C. E. Irwin, Army

Industrial Relations

Pearl Brown, W.A.V.E.

Plant Accounting

Robert Dohme, Army
Clifford L. Holt, Army
William D. Reynolds, Army
Anthony Dagati, Army
Wendell Townsend, Navy
Arden Hull, Army
Rudy S. Golubic, Marines
LaVerne Bloomer, W.A.A.C.
Dave Evans, Army
Paul Knapp, Army

Safety Engineering

George H. Basch, Army

Fire Department

Frank Simmone, Army



(Editor's Note . . . This is the first of a series of articles concerning the importance of little things in the war. They are written by G. E. Moore, Associate Supervisor in the Telegraph and Teletype Division.)

NO matter what we do, we can always do better. For example, here is something of which we're all guilty.

(3:20 p. m.) Mr. America places telephone receiver to his ear. "Operator, give me such and such a person, number, and company in New York . . . yea, that's right . . . pause . . . by the way, very busy today? . . . pause . . . well, I am too. O.K. so long. Call me back when you are ready (3:21 p. m.).

(3:24 p. m.) Hello Charlie, how's the wife and kids? Blah, blah, etc. (3:28 p. m.) What I called to ask you was can you check and see if it will be possible blah, blah, etc. (3:29 p. m.). Yea, that's right. No hurry. Call me back tomorrow."

Now let's break this down into cold, hard facts. First, Mr. American businessman tied up his line in trivial conversation with his operator. Second, after he was once connected with his party, he spent four of the five minutes "shooting the bull". Third, the business carried on during the remaining minute of this connection could have been handled by special delivery or registered mail. Total cost for telephone call for five minute duration was $1.65.

Had Mr. America heeded the plea of commercial communication companies and Uncle Sam, in reducing the number of calls as well as the length of conversation to a positive minimum, something similar to the following would never occur.

Using the figure of 5,000,000 persons, authorized in the use of long-distance telephone service, assisting in the war effort and consider the fact that he or she is considerate most of the time in his or her effort to reduce to a minimum this usage.

Out of five to ten calls per day, should he slip only once per week, the result in cost chargeable to the government would be the staggering sum of $6,500,000 per week, or $338,000,000 per year. (Figure it out yourself). Overlooking the matter of possible life or death, in which circuit time lost could result, and considering the fact that there are 40,000,000 taxpayers, Mr. America has increased his income tax to the tune of $8.45. Incidentally, this gentleman will undoubtedly be the **first** taxpayer to gripe about excessive taxes and will probably be the **last** person in line on the **last** day income tax is payable.

Personality Projectiles . .



A. M. Lucha

Director of Commissary and Dormitory . . . Graduated from Cornell in 1935 with a degree in Hotel Management . . . Formerly employed by Child's Restaurants and Statler Hotels. Started at R.O.P. October 28, 1940. Designed and equipped the new Commissary . . . Is married and has two children.

Think Before You Talk!

The worker in a war plant has much information that the enemy would like to have. Remember the following rules in your discussions.

1.—If you heard it . . . don't repeat it.

2.—If you saw it . . . don't tell it.

3.—If you read it in a public paper or magazine . . . then talk about it as much as you like.



By Lucille Lamkin

Supv. Women's Recreation Activities

THE food rationing belt is tightening, girls! "Fine," you answer. "Now I'll lose some of those superfluous pounds." But don't forget . . . your losing energy too.

Good nutrition has always been the backbone of good health and now, more than ever, good health is a necessity.

The diet of workers, as well as that of the armed forces, must be maintained at a high level to insure the unbroken flow of production in war plants. It's the women's job to see that meals in the home and in the lunch box are nutritious.

Probably the meals most abused by the majority of war workers are breakfast and lunch; the two most important meals of the day. Enough is generally eaten to satisfy hunger, but they are not usually foods of high nutritious value. Nutrionists tell us that there are five fundamental fods: 1. Milk. 2. Eggs or meat or cheese. 3. Fresh fruit (especially citrus fruits). 4. Green and yellow leafy vegetables. 5. Bread (whole wheat or enriched white bread well buttered for sandwiches). Every worker's lunch should contain one of each of these five foods every day.

The British Army has proven that a nutritious diet, adequate sleep, hard physical work, and healthy recreation raise the physical well-being of an individual to a marked degree. They discovered that 87% of the men rejected for army training, because of failure to pass the physical requirements, later were able to pass an examination after being subjected to a balanced plan of food, sleep, work and play.

FOOD WILL WIN THE WAR . . . the countries with the best fed armed forces and the best fed civilians will have the health, efficiency and morale to wage a good fight and WIN. So come on, W.O.W.'s let's take on this responsibility of feeding our families the right kind of food and help win the war.

FOR US ALL

★ ★ ★ ★ ★

War Bonds

are an

Investment

in

AMERICA'S FUTURE

Your Country Needs That 10% Now . . .

1. To help pay for the guns, tanks, planes and ships we must have to win this war.

2. To help in keeping living costs down by taking money out of circulation.

You Will Need That 10% Later . . .

1. For MANAGEMENT—those War Bond dollars will help provide millions of customers with the money to buy peace-time goods, when the war is won.

2. For LABOR—those War Bond dollars will buy the peace-time goods you want, and will help insure your jobs in making those goods again.

CONTROL LABORATORY LEADS BOND PURCHASES

THE Control Laboratory, with deductions totaing 12.04 per cent, draws the honor of leading the Ravenna Ordnance Plant in percentage of Payroll Deductions for United States War Savings Bonds.

John Hunter, head of the Bond Division, announced that two production lines, Fuze Lines 1 and 2, ranked second and third with percentages of 11.28 and 10.59.

Several additional departments show high percentages but R.O.P. as a whole averages only 8.83 per cent.

Figures are based on actual payroll which includes overtime. It is recognized that the percentages in some cases would be slightly higher if based on the normal 48-hour week.

Our job at R.O.P. is cut out for us. We must keep the Payroll Savings Army growing, and keep it alive . . . for the duration.

Already—there are more than 27,000 firms who have topped a 10 per cent average payroll deduction for all of their employes. Our job is to become one of those firms, and to stay there.

Already—there are more than 23,000,000 workers enrolled in the nation-wide Payroll Savings Drive. Our job is to enroll more and more R.O.P. employes at the 10 per cent level . . . and keep them there.

"Put me down for $7.50 . . . "I'll sign my card for a bond every pay" . . . "Count me in for 10 per cent . . . let's make the workers' voices echo as they swell the R.O.P. Payroll Savings Army.

If You Think You're Pinched and Can't Afford 10 per cent for U.S. War Bonds—

These prices are taken from a letter smuggled out of Belgium at the end of August, 1942, to the Belgium Information Center, New York City.

Eggs	$4.00 per dozen
Butter	$4.00 per pound
Coffee	$13.00 per pound
Onions	60c per pound
Flour	$1.50 per pound
Soft coal	$60.00 per ton on the Black Market

Ten Per Cent

Johns and Dicks, Joes and Toms
Facing guns, facing bombs.
In there fighting, fighting hard,
It's our freedom that they guard.
Don't grudgingly give ten per cent—
For peace and freedom it is meant.

Our boys are giving up much more,
For they want to win this war.
They wade right in and blast those Japs,
With time, they'll wipe 'em off the map.
Don't rue the ten per cent you give—
You want to dance, and sing, and live!

This is no game of run-sheep-run,
And every blessed mother's son
Is in there pitching all the time.
And they depend on every dime
To keep them clothed, and fed, and armed—
For ten per cent we live unharmed.

If we would keep this land of plenty;
Laymen, Bourgeoisie, and Gentry,
Pledge allegiance to your flag;
Keep up morale, don't let it sag.
Give willingly that ten per cent—
Freedom's the price, we're victory-bent.

By Mrs. Goldie S. Meckler
Badge 21144, Planning Division

SECTION 8:

SELECTED EXCERPTS FROM THE 1944 WAR DEPARTMENT AMMUNITION INSPECTION GUIDE TECHNICAL MANUAL, TM 9-1904 REGARDING MAGAZINE INSPECTIONS, SAFETY, CLEANING, AND STORAGE

sufficient weight to sink to the ocean floor. Only at establishments located near a deep sea waterway is this method practicable. Port authorities must be consulted prior to taking explosive materials out to sea.

TRANSPORTATION.

Personnel supervising the loading of boats and barges should be familiar with Army Regulation No. 55-470. Unless a definite location for dumping is designated by the local port authorities, no explosive material should be thrown overboard within a distance of 10 miles from shore. An effort should be made to locate a deep place or a ledge sloping seaward. Instances are on record of heavy items of ammunition being washed ashore from almost incredible distances. During daytime transit, the boat or barge will display a red flag 4 feet square at least 10 feet above the top deck. At night, a red lantern is substituted for the flag. A competent man on board must be on the alert to signal approaching vessels of the cargo.

DUMPING.

All precautions relative to the safe handling of the various types of ammunition being destroyed will be carefully obeyed. All materials must be carefully removed from their packing before being dumped overboard. Great caution must be exercised to see that none of the items strike together or strike any part of the boat or barge.

FURTHER REFERENCES: The following references apply to all methods of destruction of unusable ammunition and explosives: FM 5-25, Engineer Field Manual; TM 9-1900, Ammunition General; O.O. 7224, Ordnance Safety Manual; SNL R-7; Training films; 5-270, Explosives and Demolition, TNT; 5-271, Explosives and Demolition, Nonelectric blasting equipment; 5-272, Explosives and Demolition, Electric blasting equipment, 9-2007, Destruction of Unusable Ammunition, Burning; 9-2008, Destruction of Unusable Ammunition, Detonation; 9-2009, Destruction of Unusable Ammunition, Dumping at sea; AR 55-470.

SECTION X.

MAGAZINE AREA

Chapter 1

Magazine Construction and Inspection

GENERAL. The end of World War I found this country with tremendous stocks of ammunition, powder, and bulk explosives. Proper storage facilities were not available for this quantity of material, and makeshift arrangements were found necessary. Among the early types of storage, wooden buildings, open sheds, and even outdoor storage with tarpaulin protection were resorted to. As might be expected, this type of storage proved unsatisfactory in many ways.

Exposute to excessive heat and moisture accelerated deterioration.

Nonfireproof construction permitted an exterior fire to destroy and explode the ammunition and explosives.

Lack of lightning protection caused a considerable hazard during thunderstorms.

Nonbulletproof construction permitted accidental shooting into magazine to set off some types of material so stored.

It is the purpose of this discussion to indicate the improvements made as evidenced by modern construction of magazines.

There are at present two distinct types of magazines: the above ground, and the underground or igloo. The tendency at new depots under construction is to make all magazines of the standard underground type.

ABOVE GROUND MAGAZINES.

Description. A typical modern above ground magazine has concrete foundation walls and piers. The walls are of hollow tile with or without a sand filler. The sand filler is for the purpose of preventing missiles from penetrating the hollow walls. The framework is of steel, and the floor is of concrete which may be covered with a sparkproof covering. A double pitched roof supported on steel trusses is used over a ceiling of corrugated asbestos with fireproof rock-wool insulation. The ceiling is attached to bottom chords of roof trusses.

It will be noted that the construction is fireproof. In addition, where the type of storage warrants it, the hollow tile walls are filled with sand to stop rifle bullets. This is especially important in storage of items such as black powder.

The use of hollow tile walls comes as the result of observations made at the scene of explosions in magazines. Often the radius and extent of the damage was spread by missiles formed from the bricks of which the magazines were constructed. The hollow tile construction is expected to pulverize under the force of an explosion, thus preventing large missiles from being formed.

AMMUNITION INSPECTION GUIDE

The roof is of fairly light construction, thus permitting dissipation of part of the explosion force upward.

Adequate ventilation of the magazine is provided by roof, wall, and subfloor ventilators. Ventilators are either screened or baffled to prevent fire from entering the magazine from the outside. The air space above the ceiling and the ceiling insulation both serve to prevent heating up of the magazine from exposure to sun.

Water cannot readily enter the magazine (except through humidity in the air), thus making the construction essentially waterproof.

The lightning protection system on the magazine has two primary purposes. It provides a low resistance path for currents resulting from lightning which strikes the building directly. It also serves to prevent charging up of metal parts of the building as a result of induction which may occur when the lightning strikes nearby.

To accomplish these ends, an overhead lightning rod system is set up and, in addition, all metal parts such as doors and ventilators are connected to the grounding system. The grounding system enters the ground at several different points. In addition to lowering the resistance, this serves to prevent complete failure of the grounding system if one ground connection should fail or break. The ground connection itself, may consist of a metal pipe, copper plate or graphite rod extending down into the subsoil about 5 feet deep.

Sizes of magazines depend to a great extent upon what is being stored in them because maximum permissible quantities for each type are prescribed. Typical sizes are given in the following table to aid in comparison of various types.

Type	Storage	Size
Explosive magazine	Bulk explosives	27 ft 6 in. x 43 ft 4 in.
Smokeless powder magazine	Smokeless powder in boxes	37 ft 11 in. x 110 ft
Primer and fuze magazine	Primers, boosters, and fuzes	27 ft 6 in. x 43 ft 4 in.
Ammunition magazine	Fixed and separate loaded ammunition	51 ft 7 in. x 218 ft 8 in.
Warehouses	Nonexplosive material, as, small arms	Various sizes

The description given above is typical of recent construction. Deviation from the indicated characteristics may be expected at ordnance establishments having older types of magazines.

MAGAZINE AREA

UNDERGROUND MAGAZINES.

General. The considerations of camouflage and still greater safety in storage have been taken into account in the construction of "igloos" or standard underground magazines.

The magazine is not really underground, but is built with the floor at ground level. However, a covering of earth over the top and sides constitutes the basis for the name.

Description. A typical igloo type magazine has reinforced concrete foundations, rear and front walls, and arched roof. It is this arched roof which is the basis for the name igloo. It has a built-in membrane waterproofing over the arch and rear wall. A layer of sand covered with a layer of soil is placed over the waterproofing. All metal parts are grounded, and ventilators are provided on doors, and at the rear of the magazine.

Gutters are provided beside each side wall which drain to the front of the magazine. A flutter valve which allows exit but not entrance, is provided at the drain end. The outermost extremity is closed by heavy screen to prevent entry of rodents, snakes, etc.

It is interesting to note that the concrete used is of a special type which will pulverize under the force of an explosion.

The entire arch roof as well as front and rear walls and floor are reinforced with 4-inch x 4-inch mesh, 0.20-inch diameter iron, while the sides of the arch contain ⅝-inch reinforcing.

All reinforcing is grounded by means of heavy copper wire extending about 5 feet into the ground.

This type of magazine offers excellent protection against missiles coming from outside the magazine and, for this reason, igloo magazines are considered barricaded with respect to missiles.

The mound of earth and sand around and over the magazine also serves to confine the missiles resulting from explosions in the magazine and tends to retard the missiles traveling through the side wall.

Typical sizes of these igloo magazines are 30 feet x 42 feet, 30 feet x 62 feet, and 30 feet x 82 feet.

REPAIR OF MAGAZINES.

When a magazine must be repaired in any way, a decision must be reached regarding disposition of the material in the magazine. Common sense would indicate that there is no blanket rule which can be used. The following regulations should determine the action taken:

Under normal conditions exterior repairs can be made to a magazine without removing the contents.

Interior repairs to a magazine may require removal of some materials and not of others. For example, if black powder, TNT, tetryl, or explosive "D" are in the magazine they should be removed for any type of interior repair. On the other hand, assembled ammunition

such as fixed rounds packed in boxes need not be removed except in unusual cases.

All explosives and all ammunition must be removed from magazines in which repairs require the use of a blowtorch or soldering iron or the melting of asphalt.

Repair work should always be done under competent supervision and should be inspected after completion.

INSPECTION OF MAGAZINES.

General. In inspecting a magazine, it is important that special attention be given to the contents of the magazine, the magazine itself, the magazine and contents in relation to other magazines, to the rest of the post, and to the surrounding area. The summary given below is merely a rough outline of items which should be observed in each phase of the inspection.

The Contents of the Magazine. Listed below are the points which should be carefully checked in this inspection:

1. Are the mixed storage regulations being complied with?
2. Is the material separated by lots?
3. Is there sufficient aisle space?
4. Are there no blocked aisles?
5. Is the floor load too high?
6. Are all light boxes marked?
7. Are there any open boxes?
8. Is the material in stable piles?
9. Are piles separated by required safety distances where such are specified?
10. Are quantities of explosives in each pile within required limits?
11. Are total quantities in the magazine within required limits?
12. If there are detonating fuzes, is the number limited?
13. Has wooden dunnage been reduced to a minimum where required?
14. Is there any evidence of leakage from containers, or exudation?
15. Is the "housekeeping" inside the magazine satisfactory?
16. Are piles of ammunition properly grounded where this is possible?

The Magazine Itself. A thorough inspection should be made of the magazine itself to assure that all of the following points are satisfactory.

1. Are lightning rod ground connections secure?
2. Are the doors and ventilators in satisfactory condition? If made of metal are they properly grounded?

3. Is the lock in satisfactory condition?
4. Is the 50 foot fire break kept around the magazine?
5. Is there any loose wood or other inflammable material outside near the magazine?
6. Are there any leaks in the roof or breaks in the floor or walls?
7. Is there excessive condensation?
8. Is the area around the magazine properly drained?
9. Is the magazine suitable for the type of material in storage?
10. Is the magazine properly marked as required for chemical ammunition?
11. Is the auxiliary equipment required for a chemical magazine available? (For example, rubber gloves and barrel of water for WP ammunition.)

The Magazine in Relation to the Rest of the Post and Surrounding Area. One should make certain that the quantity of explosives in the magazine is within the quantity-distance limitations for the nearest magazine, public railway, public highway, inhabited buildings, or operating buildings. Any other unsafe conditions should be noted and recommendations should be made for action to be taken.

Chapter 2

Storage of Ammunition and Explosives

GENERAL.

Many different kinds of ammunition and explosives are required to meet the conditions of modern warfare. The diversity and the urgent nature of problems in the field of operations makes imperative the obtaining of any particular type of ammunition with the least possible delay. Therefore, ammunition components and explosives of all types are manufactured in excessive amounts and held in storage until they are needed by the using arms. This reservoir of ammunition must also be maintained in peacetime in the event of any emergency. In order to solve the problem of storage, depots have been established in various parts of the United States and outlying possessions.

It is the duty of personnel, including ammunition inspectors, connected with the handling, storage, and shipment of ammunition and explosives on the depot to see that pertinent regulations are enforced.

It is also their duty to obtain maximum protection against fire and explosions and to limit deterioration to the minimum.

Buildings which are of special construction and suited to the care and maintenance of ammunition components are designed for the

sole purpose of storage. Explosives and ammunition in quantity may not be stored in the buildings which are used for other purposes. Neither may they be stored in the open without the approval of the Chief of Ordnance. All explosives and ammunition except small arms should be stored preferably in arch type earth-covered (igloo) magazines. Their use for storage is required in all future depot construction and is authorized, but not required, for operating storage areas in manufacturing and ammunition loading establishments. Ordnance depots and manufacturing arsenals which have the older type of magazines or which store only limited quantities of explosives and ammunition and cannot comply with regulations for future depot construction, must comply with the spirit of the regulations.

When an examination of the storage of ammunition and explosives within a storage area is made there are five main factors to be considered:

1. Mixed storage regulations.
2. Stacking or piling.
3. Fire hazard.
4. Safety regulations.
5. Quantity distance regulations.

MIXED STORAGE REGULATIONS.

General. In the early days of explosives manufacture, black powder was the only explosive used. As time went on, such explosives as smokeless powder, TNT, picric acid, amatol, and the more sensitive mercury fulminate and lead azide were developed for military use. Then too, the components in which these explosives were used became more and more varied, resulting in many different types of containers and packing for the components. The entrance of chemical ammunition into warfare further complicated the situation. Bitter experience in the form of serious explosions taught the lesson that these various types of components had to be stored and handled according to the hazards connected with them.

The fact became evident that explosive materials had to be separated in storage. This problem of separation was solved as far as Ordnance Depots were concerned by setting up a storage chart. This chart divides ammunition and explosives into groups for storage, each group showing similar hazards, as regards:

1. The results of an explosion. For example, black powder stored in or near a magazine containing H.E. shell would obviously be endangered by fragments if an explosion occurred.

2. The ease of deterioration. For example, smokeless powder is liable to spontaneous combustion due to deterioration. If this action did take place, materials stored with the smokeless powder would be destroyed.

3. The sensitivity of initiation. For example, mercury fulminate may be initiated by a slight shock or jar. Demolition bombs stored with mercury fulminate would be subjected to the same hazard.

4. The type of packing. For example, components packed in metal crates stored with components packed in wood crates would also be subjected to the additional fire hazard of wood crating.

5. Action in case of fire. Fire fighters would not attempt to put out a fire in a magazine containing black powder because of the extreme danger of explosion. Any materials stored in the same magazine would be lost in case of fire.

6. The quantity of explosives in each unit. For example, demolition bombs are regarded as extremely dangerous because of the large amount of explosives contained (30 to 75 percent of total weight). H.E. shell contain approximately 15 percent of explosive filler. They should not be subjected to additional hazard by storing them with GP bombs.

Deviation From Storage Chart. The only deviation from mixed storage regulations on the Ordnance Depot is in the case of temporary storage in shipping and receiving buildings. Subject to certain limitations, ammunition and explosives may be stored in accordance with the Shipping and Storage Chart of Explosives and Other Dangerous Articles. This chart is contained in the Interstate Commerce Commission Regulations for the transportation of explosives and other dangerous articles. Such storage will be in buildings specifically designated and used as packing or shipping buildings. The limitations under which storage according to ICC Regulations is permitted are as follows:

1. Incoming shipments will not be allowed to accumulate but must be distributed as soon as practicable after receipt.

2. Items for outgoing shipment will not be accumulated prior to receipt of orders covering each specific shipment.

3. Special rooms will be provided for the temporary storage of ammunition and explosives awaiting shipment, and for their preparation for shipment by assembling, crating, marking, etc. These rooms will be separated from each other and from offices and rooms in which inert operations such as the preparation of stencils, packing, and crating materials are performed by substantial dividing walls so constructed that they will act as fire walls.

4. Not more than three cars of ammunition or explosives, including both incoming and outgoing cars, will be permitted at a shipping or receiving building or at a building used for both shipping and receiving. In no case shall the total amount of explosives contained in cars and buildings combined exceed that authorized by the intra-

985616 O 52 50

AMMUNITION INSPECTION GUIDE

The letter X at an intersection of a horizontal and vertical column shows that the item in the horizontal column may be stored with the item in the vertical column.

| | A. Aluminum powder | Magnesium powder | B. Ammonium nitrate | DNT | C. Cyclonite | Pentolite | Tetryl | D. Cord detonating (primacord) | Explosive D | Picric Acid | TNT (bulk) | Demolition blocks | E. Lead azide (wet) | Mercury fulminate (wet) | PETN (wet) | F. Adapters, boosters, and bursters | Detonators, blasting, and percussion caps | Fuse, blasting, time | Fuzes, antitank mine | Fuze, anti-tank mine, practice, with smoke charge | Fuzes, detonating and time | Fuzes, grenade | Primers and primer detonators | G. Antitank mines, practice | Antipersonnel mines | Ball and A.P. ammunition, 20-mm | Blank ammunition for cannon | Bombs, fragmentation (in wood crates) | Bombs, practice, packed with spotting charge | Grenades, hand and AT—excepting training | H.E. ammunition, 20-mm | Light mortar shell (81-mm and less) | Rockets, AT, AA, and artillery (including practice) | Separate loading shrapnel | Shell and shrapnel, fixed and semifixed | Small-arms ammunition | H. Bombs, demolition | Bombs, fragmentation (in metal crates) | Shell, H.E. Livens | Torpedo, bangalore | I. Pyrotechnics | Antitank mines, H.E. | Black powder, bulk, saluting, spotting and smoke puff charges | Bombs, photoflash | Chemical amm. gr. A (persistent vesicants) | Chemical amm. gr. B (toxic and smoke) | Chemical amm. gr. C (phosphorus) | Chemical amm. gr. D (burning) | Chlorates, perchlorates, and peroxides | Dynamite | Flashlight powder | Nitrocellulose | Separate loading shell | Smokeless powder, bulk or charges | Tracer mixture |
|---|---|---

plant quantity-distance table for the distance to the nearest magazine or operating building.

5. These shipping and receiving buildings must also comply with prescribed safety distances with respect to inhabited buildings, public railways and public highways, based on the ammunition and explosives in buildings and cars combined.

Use of Storage Chart for Ammunition and Explosives. The X in the intersection of a horizontal row and a vertical column indicates that these items may be stored together. As one example, small arms may be stored with pyrotechnics. Where X appears in all of the intersections within a group, any or all of the items in a group may be stored together. For example, any or all of the items in group C may be stored in one magazine. Where X does not appear at the intersection of a row and a column, the two items may not be stored together in one magazine.

All of the materials within a group may be stored together and may not be stored with the materials in any other group. Such groups are lettered A through I. The only exception is in the case of small-arms ammunition (including 20-mm ball and armor-piercing ammunition) which may be stored with materials in groups F, G, and I. Items which must be stored alone in a magazine are listed at the bottom of the chart following the groups.

It should be noted that all components should be separated in storage except where the possibility of losing an entire stock of one item is decreased by dividing the stock into two or more magazines. For example, fuzes are limited to 50,000 of any one type to a magazine. The storage chart is to be used only in the case of such exceptions and where storage problems make it necessary to store more than one type of ammunition or explosive within a magazine. This is especially true at depots where small amounts of various types of ammunition are stored.

The storage chart does not list all ammunition components and explosives. Where items are not covered in the chart, it should be used as an indicator. Semi-armor-piercing bombs, for example, are not included. However, they are loaded with amatol as are general purpose or demolition bombs and are shipped and stored similarly. Therefore, presenting like hazards, the two types of bombs where the situation warrants such action may be stored together. Armor-piercing bombs are not included in the chart. They are loaded with explosive D and present the same hazards as artillery shell loaded with explosive D. Therefore, it may be assumed that the two items may be stored together in one magazine. Inert materials are not listed in the storage chart and should not be subjected to explosive hazards by storing them with loaded components. Neither should explosive materials be subjected to the additional fire hazards of inert compo-

nents packed in cardboard or wooden containers. These inert items should be stored preferably in weatherproof warehouses. If warehouses are not available, inert items may be stored in magazines, but not with explosive materials.

PILING AND STACKING.

General. Specific methods of piling or stacking of all types of ammunition are described on ordnance drawings. Before making an examination of any specific type of ammunition or explosives in storage, the inspector should read the drawing carefully to determine exactly how the item should be stored. There are certain rules to remember in addition to the information obtained from the drawings which apply to all types of storage. These are as follows:

1. Explosives or ammunition in piles will be separated by type and by lot.

2. Adequate dunnage will be used on the floor to protect the material in the pile from water and dampness.

3. Methods of piling or stacking will provide for good ventilation to all parts of the pile. Dunnage will be used as required.

4. Unless otherwise specified on ordnance drawings, aisles will be maintained so that units in the pile can be inspected, inventoried, and removed for shipment or surveillance tests.

5. Lids or opening ends of containers should face the aisles.

6. Partly filled boxes will be marked plainly and placed in conspicuous places on top of the piles containing the lots to which they belong.

7. Nomenclature on containers should be in such a position as to be easily read.

8. Inflammable material, such as dunnage and boxes, will be eliminated or reduced to an absolute minimum in magazines containing class 9 and class 10 materials (quantity-distance tables).

9. Quantity-distance requirements with regard to separation within magazines or other buildings will be observed carefully.

10. The piles or stacks of ammunition or explosives will be stable. Usually a level pile is a stable pile. Therefore, the stability of the pile may be checked by observing how straight the rows are horizontally and how straight the tiers are vertically.

Numbers of drawings of representative types of storage and information pertinent to inspection that may be obtained from the drawing will follow. This discussion will pertain mainly to storage in arch type earth-covered (igloo) magazines because their use for storage of all ammunition and explosives except small arms is required in future depot construction. All of the drawings referred to are for permanent storage. In wartime, when metal dunnage cannot be obtained, wood will be substituted and methods of stacking suitable to storage on wood will be used. Ways of stacking which deviate

from those specified on ordnance drawings will conform in so far as possible, to the regulations contained herein. Such deviations should also provide for maximum storage and for maximum speed in getting components ready for shipment.

Bulk Black Powder Storage. Drawing 19-48-179 shows storage of black powder in metal containers (25 lb of explosive per container). The containers are stacked in double rows, pyramid fashion on floor dunnage only, running the length of the igloo. Aisles are maintained on all sides of the double rows and the tops of all cans are toward the aisles. Wooden floor dunnage is required because it is nonsparking. The detail indicating the proper position of the container seam in storage, shows it on the side, lip downward. This position is important because water will run over rather than into the seam and will drop off. The stops on the ends of the dunnage must be securely fastened in order to bear the weight of the pile. The maximum amount of explosive allowed is 250,000 pounds.

Bulk Smokeless Powder Storage. Storage for smokeless powder contained in the steel box in igloo magazines is shown on drawing 19-48-92. The boxes are stacked in double rows across the magazine and are held in place by steel dunnage made up of flat, angle, and channel irons. The floor dunnage is elevated on the aisle sides so that the containers lying on their sides are on a 20-degree angle with the lids to the aisles. The lid, which is off center in the can, should be uppermost so that methyl violet inspection may be made without spilling the powder. The containers being slanted inward make for a more stable pile and also permit any accumulated moisture to run off. Aisles are maintained on all sides of the double stacks except at the side walls of the magazine. A center aisle is left in order to give access to all containers. The boxes on the center aisle are stacked straight up in block form while those at the sides follow the contour of the magazine. No containers should touch the walls as condensation often occurs there and may result in rust and deteriorated powder.

Cloverleaf Bundle Storage. Many ammunition components and explosives are packed in fiber drums which are in turn assembled into a cloverleaf. Such items include fixed and semifixed artillery ammunition, trench mortar ammunition, separate loading propelling charges and rockets. Drawing 19-48-21 showing storage of 60-mm mortar shell in igloo magazines is typical of bundle storage.

The bundles are stacked in double rows on metal dunnage consisting of channels on the floor and angle iron supports on the center aisle. The bundles are stacked so that the tiers form a straight line perpendicular to the magazine at the center aisle and follow the contour of the magazine at the side walls. There is a single row in the extreme rear of the magazine, commonly called the back stack,

which is piled on floor dunnage only. The wing nuts on all packages should face the aisles and should be secured with an ordnance seal. Aisles are maintained between all double rows, at the center, in front, and between the last double row and the back stack. The bundles are nested together in the stack so that each bundle on the bottom tier rests on the dunnage and every other bundle is inverted.

Bundles Crated for Export. Due to conditions of war, it is deemed advisable to have all types of ammunition crated for export. Even propelling charges, which are stripped of wooden crating when placed in the magazine during peacetime, are stored crated in order to facilitate shipment to foreign theatres of operations. There is no occasion for inspection of long time storage under these conditions so the crates are stacked in intimate contact leaving only center and front aisles. Drawing 19-48-185, illustrating storage of 105-mm shell crated for export is typical of this type of storage. Every other crate is inverted and dunnage is used between each tier to give the pile stability. The crates are stacked solidly across the magazine from the back stack to the front aisle leaving aisle space in the center.

Box Storage. Ammunition or explosives packed in boxes are piled in block form following the contour of the igloo at the side walls. There may or may not be aisles between rows of boxes, depending upon the component. For instance, TNT is subject to sympathetic detonation and consequently is stacked solid on either side of a center aisle. If one box catches fire or explodes, all boxes in the magazine will be lost. Inspectors should be certain that boxes containing TNT or like explosives are stored with top side up so that the explosives will not sift out. Dunnage necessary for proper ventilation will depend upon the types of boxes. Storage of TNT is shown on drawing 19-48-55.

Storage of Separate Loaded Shell. Drawing 19-48-22 shows storage of separate loaded shell of 10 inches or less in caliber. There are no provisions made for inspection within the magazine. The piles consist of a back stack and double rows across the magazine leaving center and front aisles. The shell are stacked nose to nose and base to base leaving from 2 to 4 inches between noses. The shell in the back stack are piled with their noses to the wall. The dunnage consists of channels on the floor and bar steel between each tier with stops at the end to keep the shell from rolling. Care must be taken to keep the rotating bands from being injured by resting on the dunnage. Since the shell cannot be inspected during storage, a 100-percent inspection of fuze cavities should be made before shipment. All unfuzed shell must be fitted with fuze hole plugs adjusted to hand tightness. All piles of separate loaded shell should be grounded for lightning protection.

AMMUNITION INSPECTION GUIDE

Quantity-distance regulations are not observed in the igloo magazine, the shell are regarded as liable to mass detonation for quantity-distance purposes. Chemical shell are separated by aisle spaces however because they must be readily accessible to facilitate the handling of leakers. Separate loaded shell in the standard magazine are stacked in single rows, nose to nose, with aisle spaces which conform to quantity-distance. When the number of shell to be stored in a magazine is less than the quantity shown on ordnance drawings, quantity-distance separation between piles will be observed in the igloo and the number of shell in a pile in the standard magazine will be reduced rather than making an increase in the distance between piles.

Projectiles for fixed and semifixed ammunition, not assembled to or packed with cartridge cases and propelling charges, will be treated as separate loaded shell in regard to both piling or stacking and mixed storage.

Shell of Over 10 Inches in Caliber. Shell larger than 10 inches are stored on their bases on appropriate floor dunnage. Shell loaded with TNT or amatol must be separated by caliber distance. For example, shell of 12-inch caliber must be placed so that no shell will be within 12 inches from it. Shell loaded with explosive D may be stored in intimate contact.

The principles discussed above for storing separate loaded shell are based on the results of comprehensive tests at Aberdeen Proving Grounds. The following conclusions were reached as a result of these tests:

1. An explosion of shell loaded with TNT or amatol could be confined to one pile if ample distances were maintained between piles in a magazine.

2. Distance between piles at which an explosion would be transmitted increases with the number of shell in the pile in which the explosion originated.

3. All shell in the pile in which an explosion starts will explode. Piles should be reduced to the smallest practicable size if the effects of the explosion are to be limited.

4. Distances to be maintained between piles to prevent an explosion from being transmitted must be greater for shell fitted with die-cast white metal fuze hole plugs than for shell fitted with steel or iron fuze hole plugs.

5. It is practically impossible to explode a pile of shell loaded with explosive D. Explosions are usually of a very low order and limited to one shell.

6. Shell should be arranged in single piles, nose to nose or base to base. The lateral distance at which explosions are transmitted is several times greater than the nose to nose or base to base distance.

MAGAZINE AREA

7. If piles are knocked down or disarranged by the explosion of one pile, or of an enemy bomb, or any similar occurrence, it is possible that a subsequent explosion will cause a mass detonation of the disarranged piles.

Bomb Storage. Chemical bombs are packed in boxes and follow the block form of storage with a back stack in the rear of the magazine and aisles between double rows. Aisles are also left in the center and in front. Armor-piercing bombs are stored similarly to separate loaded artillery shell filled with explosive D.

Demolition bombs (general purpose, semi-armor-piercing and depth bombs) and fragmentation bombs are subject to mass detonation and because of the large amount of explosive in each unit are regarded as one of the most hazardous types of ammunition. Safety can be obtained only by reducing the possibility of fire to an absolute minimum since no feasible way has been found of separating bombs or of barricading piles of bombs in a magazine to reduce the hazard of mass detonation. If igloo magazines are available, they should be used for storage of general purpose and semi-armor-piercing, depth, and fragmentation bombs. Wood dunnage will be used only in cases where metal dunnage cannot be obtained.

Drawing 19-48-1 is representative of storage of general purpose and semi-armor-piercing bombs from 250 to 2,000 pounds in weight. 100-pound bombs are stored as complete unassembled rounds in metal crates which are stored similar to boxed ammunition. Bombs larger than 100 pounds are stacked crosswise of the magazine in single rows leaving aisle space in the center and aisles between stacks. None of the bombs will be fuzed but will be fitted with shipping plugs screwed to hand tightness. These shipping plugs should be unscrewed, the fuze cavities inspected, and the plugs reassembled to hand tightness. The floor dunnage consists of channel irons and the dunnage between tiers is made up of I-beams. The shipping bands fit into the channel irons and I-beams. The above drawing shows shipping bands interlocked. Due to a change in the width of shipping bands, this practice is discontinued and the dunnage is made to fit the width of one band. The bombs are kept from rolling by placing iron wedges under the shipping bands at either end of the stack and backing them up with a piece of wood of appropriate length between the wedge and flat steel welded across the end of the channel or I-beam.

4,000-pound bombs are also stored on channels and I-beams, but the stacks consist of single rows, 2 bombs high on either side of the magazine (drawing 19-48-85). The noses of the bombs face the center aisle. Seven bombs are stored in the center aisle on the floor and 3 bombs are on the floor on each side of the center aisle in the front of the igloo. This storage just fits the 60-foot igloo with

77 bombs containing approximately 250,000 pounds of explosive which is the maximum permitted in the magazine.

FIRE HAZARDS.

Relative to Storage Within the Magazine. Magazines are constructed for the sole purpose of storing ammunition and explosives. Materials that are unnecessary, such as excess dunnage, trash, etc., are not to be permitted in the magazine. Materials crated for protection during shipment, such as propelling charges in wooden crates, must have the crates removed before they are stored because the wood is not necessary for protection during storage and constitutes an additional fire hazard. Extremely hazardous materials, such as general purpose and semi-armor-piercing bombs should be stored on metal dunnage if it can possibly be obtained. Black powder will not be stored on metal dunnage because of its sensitivity to sparks.

Any oil stains or exudate will be eliminated immediately. Materials subject to exudation, such as separate loaded artillery shell which are liable to exude on the floors, will never be stored in magazines floored with wood. Neither will chemical ammunition be stored on wooden floors.

There should be signs placed at the approaches to the magazines indicating the types of ammunition or explosives stored within, so that depot firemen will know what action to take in case of fire. In some cases, firemen will not attempt to extinguish the fire but will limit their efforts to preventing it from spreading. In other cases, depending on the components stored and the extent of the fire, they will attempt to extinguish the fire at its origin. If evidence of fire is detected by personnel in the area, they will turn in the fire alarm before making any investigation. Fire extinguishers, water barrels, buckets, and other auxiliary fire fighting equipment such as gunny sacks and brooms, at or near magazines, will be arranged in a neat and orderly manner and will be protected against undue deterioration. They will be placed uniformly in position where they are in plain sight and readily available. The inspector should make a periodic inspection of such equipment to see that it is in good order.

Fire Hazards With Regard to Storage Area Operations. Operations in the storage area will be accompanied by applicable fire-fighting equipment. Inspectors should examine fire extinguishers carefully to see that they are properly filled and in good working order. Any paints, oils, or solvents carried into a building in which explosives are stored should be kept in safety containers. Rags soaked with these liquids will not be allowed to accumulate. Safety tools will be used as designated in the Ordnance Safety Manual. Wood left from crating or loading must be removed at the close of the day's operation or as soon as possible thereafter. If a portable light

source is needed for the inspection of a magazine or other operations, it should be an explosion proof type of electric light.

Fire Hazards Relative to the Repair of Magazines. The following special regulations with regard to safety are particularly applicable to the repair of magazines:

1. All work will be done by careful, experienced workmen under competent supervision.

2. Safety tools will be used when indicated.

3. The floor in the immediate vicinity of the repair work will be swept carefully.

4. No work requiring soldering, the melting of asphalt, or the use of blowtorches will be done in a magazine containing explosives or ammunition.

5. No repairs will be made to the interior of a magazine containing bulk explosives such as black powder, TNT, tetryl or explosive D, until all explosives have been removed.

6. Magazines in which repair work has been done will be inspected by competent authority upon completion of the work.

7. When melting pots or any other heating apparatus, electrical or otherwise, are authorized by the commanding officer in any magazine or explosives area in connection with repair work on buildings, all such equipment should be kept at least 100 feet from any magazine or building containing explosives or ammunition and should be baffled or screened as necessary to prevent danger from sparks or flame.

The Fire Break. The area within a radius of 50 feet of the magazine is designated as the fire break. The vegetation within this area must be controlled to a height of not more than 10 inches. This space must also be free of all dry grass, leaves, rubbish, lumber, left-over dunnage, conveyors, etc.

SAFETY REGULATIONS.

Regulations for the safe manufacture, handling, shipment, and storage of any particular type of ammunition or explosives are contained in the Ordnance Safety Manual. The following are safety regulations that apply generally to the storage of ammunition and explosives:

1. Containers will be free from loose dirt and grit when stored. Dirty containers will not make a stable pile. Cleanliness runs hand in hand with safety.

2. Containers will not be opened or repaired in a magazine. This will be done in a building specifically set aside for this purpose or, in clear weather, in the open at sufficient distance to comply with intraplant quantity-distance tables (pages 802 to 806), but at least 100 feet from any building containing explosives.

3. Explosives and ammunition in damaged containers will not be stored in a magazine. Such containers will be repaired or the contents transferred to new or serviceable containers.

4. Open containers and containers with covers not securely fastened will not be allowed in magazines. Containers that have been opened will be closed again as effectively as is required upon manufacture or ordnance drawings.

5. Loose rounds or loose components will not be stored in the magazines.

6. The temperature in a magazine will be kept as even as possible. Sudden changes in temperature may damage airtight containers, or may result in excessive condensation of moisture in the air. If the temperature in a magazine exceeds 100 F for a period of more than 24 hours, the magazine will be cooled by wetting the exterior of the building with water or by opening the doors and ventilators after sunset and closing them in the morning. If these methods do not prove effective in lowering the temperature, the commanding officer will decide if the stores are to be removed to some other magazine, and will report such cases to the Chief of Ordnance. Maximum and minimum or recording thermometers are placed in representative magazines, and the records of the temperatures in those magazines are included in the monthly report of the ammunition inspector.

When temperature is controlled by opening the doors after sunset, effective measures will be taken to protect the stores against fires, and provision will be made for closing the doors in case of rain.

7. Two or more doors, when available, must be unlocked when personnel is working in a magazine in order that more than one means of escape will be available.

QUANTITY-DISTANCE REGULATIONS.

General. Storage areas, manufacturing and loading areas, administration buildings and other facilities at ordnance establishments, and such public installations as railroads, highways, and inhabited buildings bordering the depots must be separated from any point of which an explosion may occur by safe distances. These distances are dependent upon the type and quantity of the ammunition or explosives and upon the construction of the buildings in which they are stored. The ammunition or explosives within an area must also be separated by distances that will not permit explosions or fires to be propagated from one point to another.

The distances and maximum quantities set forth in this section are based on the following basic data:

1. Records of fires and explosions involving military explosives and ammunition.

2. Reports covering a comprehensive series of tests at Aberdeen Proving Ground.

3. The American Table of Distances, published by the Institute of Makers of Explosives, United States of America.

4. Chapter 87, Laws of 1925, State of New Jersey. Where, under quantity-distance, explosives and ammunition are grouped into classes, it is not meant or implied that the articles in a particular class are to be stored together, but merely that the hazards involved are similar for all articles in each group. The materials that may be stored together are designated in the storage chart on pages 786 and 787. The quantity-distance tables are based on three hazards: namely, fire, missile, and concussion. The table for a particular class of ammunition will be based on the hazard causing destruction at the greatest distance.

EXPLOSIVES HAZARDS AND QUANTITY-DISTANCE REQUIREMENTS.

Fire is the most common hazard incident to the manufacturing, processing, handling, and storage of ammunition, propellent powders, and other explosives. Except under unusual circumstances relating to methods of packing and heights of column for certain types and granulations (Ordnance Safety Manual, par. 94), smokeless powder is considered a fire hazard only. Consequently, in the smokeless powder tables (class 2) the quantities and distances shown are for fire protection only. Pyrotechnics, excepting flashlight powder and photoflash bombs, small-arms ammunition, and chemical ammunition are also considered fire hazards only, as regards quantities and distances. Most other items of ammunition and explosives may, as a result of fires, detonate and spread disaster to distances considerably in excess of fire-protection distances.

Missile hazards are introduced by explosions involving high-explosive shell or loaded ammunition components. Missiles may be projected either as pieces of broken shell cases or other components, or as complete projectiles which may and often do explode on impact or as a result of heating in burning explosives or other fires. Some of the worst disasters have resulted from high-explosive shell spreading explosions from building to building. Missile distances prescribed in the quantity-distance tables for classes 3, 4, 5, 6, and 7 are based upon tests made at Aberdeen Proving Ground. These distances do not take into account occasional missiles which may be thrown a mile or more. They are based upon the distance within which most missiles will fall.

Concussion effect which is produced by the detonation of explosives constitutes the commonest hazard associated with explosives. The distances given in the tables 8, 9, and 10 are expected to give protection against the concussion effect of explosions. They are identical with the American Table of Distances published by the

Institute of Makers of Explosives. Concussion hazards have been divided into three separate classes.

Structural damage to inhabited buildings. The distances shown in tables 8, 9, and 10 for inhabited buildings represent the distances at which buildings will be safe from substantial structural damage. Minor damage such as the breaking of window glass or the shaking down of plaster and possible damage from flying missiles is not considered as substantial structural damage. The term "substantial damage" is defined as follows: In stone or brick buildings, the serious weakening of or displacement of portions of supporting walls (i.e., foundations, side walls, or interior supports) and the breaking of rafters or other important roof supports or floor joists; in frame buildings, the serious weakening of or displacement of foundations, the breaking of any of the main supports in the side walls or interior supporting walls, and the breaking of any main supports of the roof or floors.

Structural damage to railroad equipment. The distances at which railroad cars are considered safe from the concussion effects of explosions have been fixed in the American Table of Distances at 60 percent of the inhabited building distance. These distances have been used in tables 8, 9, and 10. The use of the lesser distances was based on the following considerations: The lesser height and smaller area of railroad trains exposed to concussion, and the greater strength of railroad cars to resist concussion, as compared to buildings; and the fact that while a building is stationary and subject to any risk constantly, the presence of a train is only temporary.

Injury to persons on public highways. The public highway distances shown in tables 8, 9, and 10 were taken from the American Table of Distances. They represent the distances at which persons in the open are safe from the concussion effects of explosions. The cases tabulated by the Institute of Makers of Explosives did not conform to a fixed pattern, and in arriving at distances which would be safe and well beyond the distances at which injuries have actually occurred, public highway distances were fixed in the American Table of Distances at one-half the railroad distance or 30 percent of the inhabited building distances.

Explanation of terms used in quantity-distance.

Inhabited building. Any building customarily used as a habitation, church, schoolhouse, hospital, railroad station, or for other purposes of assembly; including general purpose buildings such as offices, barracks, shops, and power plants. Buildings pertaining to an explosives line or magazine area such as operating buildings, watchmen's shelters, field offices, and packing and shipping buildings are not considered as inhabited buildings. Lands outside of and adjacent to boundaries of military reservations will be considered as possible

sites for inhabited buildings. Watchmen's shelters, field offices, surveillance inspection buildings and bombproofs or shelters for personnel in the magazine area will not be located closer to magazines than the magazine to magazine distance for the quantity and classes of ammunition or explosives involved.

Public railway. Any steam, electric, or other railroad which carries passengers for hire.

Public highway. Any street, alley, road, or navigable stream. A navigable stream is one capable of extensive navigation by barges, tugboats, and other large vessels.

Nearest magazine. The nearest magazine containing explosives or ammunition. The amount of explosives or ammunition permitted in a magazine can sometimes be increased if the nearest magazines are filled with inert materials, thus greatly increasing the distance to the nearest magazine containing explosives or ammunition.

Measurements. Measurements for determining quantities of explosives will be made from the nearest point of the building containing explosives to the nearest point of the magazine, inhabited building, public railway, public highway, or channel of the navigable stream under consideration.

Operating building. Any structure in which operations pertaining to manufacture, processing, packing or shipping of explosives or ammunition are performed.

Maximum permitted. The maximum quantity of explosives or ammunition permitted in any magazine. Maximum quantities are based on limiting losses of military stores as well as on quantity-distance considerations.

Sympathetic detonation. A sympathetic detonation is one which immediately follows as a direct result of an initial explosion. It may be the result of propagation, or it may be the result of missiles from the initial explosion. In any case, it is an explosion that so closely follows the initial explosion as to be indistinguishable from it. The magazine to magazine distances and the intraplant distances shown in this section for all classes of ammunition and high explosives are expected to give protection against propagation from explosions in adjoining buildings or magazines. It will be noted that these distances are in all cases substantially less than those required to protect inhabited buildings, against structural damage, and it is not expected that intraplant or magazine to magazine distances will give protection against structural damage.

Barricades. Whenever an explosives manufacturing building or magazine is effectively screened from another explosive manufacturing building or magazine, railroad or highway, either by natural features of the ground or by efficient artificial barricades of such

height that any straight line drawn from the top of any side wall of the factory building or magazine to any part of the explosives plant building or building to be protected will pass through such intervening natural or artificial barricade, and any straight line drawn from the top of any side wall of the factory building or magazine to any point 12 feet above the center of the railroad or highway to be protected will pass through such intervening natural or artificial barricade, the applicable distance (except missile and smokeless powder distances) as prescribed by the quantity-distance table, and the intraplant quantity-distance table, and the distances separating magazines, may be reduced one-half.

When protected by barricades at the door end, approved, reinforced-concrete, arch-type, earth-covered (igloo) magazines are considered barricaded in all directions, and "barricaded distances" may be used as minimum safe distances in locating them with references to inhabited buildings, public railways, public highways, operating buildings, or other magazines. No other type of magazine is considered barricaded unless separate barricades are provided. Where concrete igloo magazines are not barricaded at the door end, "unbarricaded distances" will be used in locating them from structures and facilities which lie in front of the magazines and within the area bounded by lines drawn from the door and inclined by 30 degrees from a line drawn perpendicular to the front of the magazine.

A barricade used for the purpose of reducing safety distances must be constructed separate from the building it is to screen and must be located at a minimum distance of 4 feet from such a building. It may be either natural or artificial. If artificial, it should consist of earth or sand-fill with a minimum width of 3 feet at the top. Either one or both sides may be riveted, or supported by concrete, timber, or masonry walls. Barricades are authorized for use in reducing both intraplant distances and structural damage distances, but not for reducing missile distances. Approved reinforced-concrete, arch-type, earth-covered (igloo) magazines are considered barricaded with respect to missiles. Other types of magazines are not considered barricaded in any respect unless separate barricades are provided.

Flash barricades which are authorized for the purpose of preventing the spread of fires will not be used for the purpose of reducing safety distances.

Dividing walls. A definition of the words "within substantial dividing walls" with reference to intraplant distances between factory buildings is illustrated by the following example. If a building contains 4,000 pounds of explosives and is provided with a "substantial dividing wall," dividing the building into two rooms, one containing 3,000 pounds of explosives and the other 1,000 pounds, the distance between the room containing 3,000 pounds of explosives and the near-

est operating factory building is based on the distance required for 3,000 pounds of explosives. To describe it otherwise, "a substantial dividing wall" would, in the event of a detonation of the larger quantity of explosives, prevent the sympathetic detonation of the lesser quantity of explosives in the adjoining room. The distance to the next building is governed by the 3,000 pound instead of the total of 4,000 pounds.

Substantial dividing walls used to separate buildings into individual rooms will not be added to existing buildings except by authority of the Chief of Ordnance. It is not expected that substantial dividing walls will materially limit structural damage. If all of the explosives on both sides of a substantial dividing wall are prevented from exploding en masse, the purpose for which the wall was provided has been accomplished, even though the wall may be demolished and structural damage in the plant may be severe. A substantial dividing wall must extend to the roof and to the side walls of the building or room which is divided into separate rooms. It must consist of concrete at least 12 inches thick, reinforced on both sides by rods at least ½ inch in diameter, located on maximum centers of 12 inches both vertically and horizontally. This paragraph should not be interpreted as discouraging the use of barricades of the bench or wing-wall type to cut down operating hazards; but for the purpose of establishing safety distances, such barricades should not be considered as dividing the explosives contained within the building or room into separate lots.

Classes and Quantity-distance Tables for Military Explosives and Ammunition. The explosive contents of ammunition and components are shown on ordnance drawings and in the complete round chart; but if these are not available, the information desired should be requested from the Chief of Ordnance. The quantities shown in the tables herein were computed in the following manner:

For smokeless powder, the quantity in pounds in the net weight of the powder in the boxes (bulk powder) or propelling charges.

For pyrotechnics, the quantity is the gross weight of the boxes and contents.

For fixed ammunition, the pounds of explosives are computed as follows:

If a magazine contains 200,000 pounds of 75-mm H.E. Shell M48, the amount of explosives in the magazine is 200,000 x 1.47 = 294,000 pounds. (1.47 pounds is the approximate weight of the high explosive in the shell.) The smokeless powder in the cartridge case is not classed as an explosive in this case and is not included in the computation.

For separate loading shell and bombs, the pounds of explosives are computed as follows: If a magazine contains 30,000 rounds of

985160 O - 52 - 51

AMMUNITION INSPECTION GUIDE

155-mm Howitzer Shell M102, the amount of explosives in the magazine is as follows: 30,000 x 15.56 = 466,800 pounds. (15.56 is the approximate weight of the high explosives in the shell.)

When military explosives and ammunition are not packed in accordance with the provisions of approved drawings and specifications, they will be stored in accordance with special instructions issued by the Chief of Ordnance. When military explosives and ammunition are packed in accordance with the requirements of approved drawings and specifications, and are stored in accordance with storage drawings, or as prescribed by the Ordnance Safety Manual, they are classified as indicated below, and will be stored in accordance with the quantity-distance tables shown.

Class 1. Small-arms ammunition, excepting 20-mm H.E.-I cartridge, fuzes without boosters, and antitank practice grenade. These materials are principally fire hazards. No limit is placed on the storage of small-arms ammunition, but the quantity limits imposed on class 3 material mentioned below apply also to mechanical time fuzes.

Class 2. Smokeless powder in containers[1], pyrotechnics, and chemical ammunition filled with phosphorus. These materials may become unsafe under extreme conditions of moisture and high temperature. They burn with intense heat.

CLASS 2 QUANTITY-DISTANCE TABLE

Quantity		Unbarricaded Distance[2] in Feet From Nearest			
Pounds Over	Pounds Not Over	Inhabited Building	Public Railway	Public Highway	Magazine[3]
100	1,000	75	75	75	50
1,000	5,000	115	115	115	75
5,000	10,000	150	150	150	100
10,000	20,000	190	190	190	125
20,000	30,000	215	215	215	145
30,000	40,000	235	235	235	155
40,000	50,000	250	250	250	165
50,000	60,000	260	260	260	175
60,000	70,000	270	270	270	185
70,000	80,000	280	280	280	190
80,000	90,000	295	295	295	195
90,000	100,000	300	300	300	200
100,000	200,000	375	375	375	250
200,000	300,000	450	450	450	300
300,000	400,000	525	525	525	350
400,000	500,000[4]	600	600	600	400

[1] Smokeless powder in containers is intended to mean any smokeless powder stored in boxes, powder cans, cartridge storage cases, or any container used for the storage of smokeless powder.
[2] Unbarricaded distances as shown always will be used when considering above-ground magazines in which smokeless powder is stored. One-half the above distances are authorized for separation of igloo type magazines containing smokeless powder.
[3] Distances shown are applicable to operations succeeding the graining operation in smokeless powder plants.
[4] Maximum quantity permitted in any one magazine.

MAGAZINE AREA

Class 3. Point-detonating fuzes, minor caliber base-detonating fuzes, powder train and antitank-mine fuzes, packed separately in boxes; bomb fuzes, packed with fin assemblies; antitank mine, practice, with smoke charge. The amount of explosives in articles of this class, including the booster, varies from 30 to 500 grains, except in the case of bomb fuzes packed with fin assemblies, which contain a charge of approximately 1,000 grains. These fuzes usually explode progressively, not more than a box or two at a time. Pressures which would cause serious structural damage to adjacent magazines are not usually generated, and missiles are small and of light weight, usually falling within 300 feet. The quantity of fuzes stored in a single magazine will be kept to the minimum, consistent with available storage, capacity. The storage of more than 50,000 fuzes of any one model, or a total of more than 150,000 fuzes of all models in a single magazine will not be permitted except by specific authority of the Chief of Ordnance.

CLASS 3 QUANTITY-DISTANCE TABLE

Quantity, Pounds of Explosives (Not Over)	Unbarricaded Distance[1] in Feet From Nearest			
	Inhabited Building[2]	Public Railway[2]	Public Highway[2]	Magazine
10,000[3]	400	400	400	300

[1] These distances will not be reduced by barricades. One-half the above distances are authorized for concrete igloo magazines, except at the door end.
[2] Missile distance.
[3] Maximum permitted in any one magazine.

Class 4. When packed in accordance with ordnance drawings and specifications: Fixed and semifixed high-explosive shell (complete rounds); light mortar ammunition; hand and antitank grenades; shrapnel of all calibers (fuzed or unfuzed); blank ammunition for cannon; 20-mm H.E.-I cartridge; AT, AA, target, and practice rockets. Articles in this class usually explode progressively, only a few boxes at a time, many explosions of individual rounds being of a very low order. Pressures which would cause serious structural damage to adjacent magazines are not usually generated, and most missiles would fall within 600 feet.

CLASS 4 QUANTITY-DISTANCE TABLE

Quantity, Pounds of Explosives (Not Over)	Distance[1] in Feet From Nearest			
	Inhabited Building[2]	Public Railway[2]	Public Highway[2]	Magazine
500,000[3]	1,200	1,200	1,200	300

[1] These distances will not be reduced by barricades. One-half the above distances are authorized for concrete igloo magazines, except at the door end.
[2] Missile distance.
[3] Maximum permitted in any one magazine.

Class 5. Separate loading shell of all calibers, loaded with explosive D, fuzed or unfuzed; and shell loaded with explosive D, fuzed or

unfuzed, not assembled to or packed with cartridge cases. These shell usually explode one at a time, and in practically all cases with low order. As only one shell should be involved in an explosion, the missiles are limited both as to number and range, and most missiles will fall within 1,200 feet.

CLASS 5 QUANTITY-DISTANCE TABLE

Quantity, Pounds of Explosives (Not Over)	Distance[1] in Feet From Nearest			
	Inhabited Building[2]	Public Railway[2]	Public Highway[2]	Magazine
650,000[3]	1,200	1,200	1,200	300

[1] These distances will not be reduced by barricades. One-half the above distances are authorized for concrete igloo magazines, except at the door end.
[2] Missile distance.
[3] Maximum permitted in any one magazine.

Class 6. Major and medium caliber base-detonating fuzes, bomb fuzes; and adapters and boosters for high-explosive shell, bursters for chemical shell, and for bombs, packed separately in boxes. The amount of explosives in single items of this class usually does not exceed ½ pound. They usually explode progressively, by piles. The number involved in any explosion is limited by making the piles small and separating them by prescribed distances determined by actual detonation tests. Structural damage caused by the pressure generated usually is limited to adjacent magazines and the missiles are light and usually fall within 600 feet. The quantity of fuzes stored in a single magazine will be kept to the minimum consistent with available storage capacity. The storage of more than 50,000 fuzes of any one model, or a total of more than 150,000 fuzes of all models in a single magazine will not be permitted except by specific authority of the Chief of Ordnance.

CLASS 6 QUANTITY-DISTANCE TABLE

Quantity, Pounds of Explosives (Not Over)	Unbarricaded Distance[1] in Feet From Nearest			
	Inhabited Building[2]	Public Railway[2]	Public Highway[2]	Magazine
100,000[3]	1,500	900	450	300

[1] These distances will not be reduced by barricades. For concrete igloo magazines (except at the door end), one-half the above distances are authorized. When items of this class are stored in igloo magazines (except when segregated into piles in accordance with drawing No. D-8361), the quantity and distance requirements prescribed for classes 9 and 10 will apply, except that no distances smaller than one-half the distances quoted in the above class 6 Quantity-distance Table are authorized.
[2] Missile distance.
[3] Maximum permitted in any one magazine.

Class 7. Separate-loading loaded shell of all calibers, fuzed or unfuzed, except those loaded with explosive D; and loaded shell except those loaded with explosive D, fuzed or unfuzed, not assembled to or packed with cartridge cases. Shell in this class usually explode

progressively by piles. The number involved in any one explosion is limited by making the piles small and separating them by prescribed distances which have been determined by actual detonation tests. Structural damage caused by the pressures generated is usually limited to adjacent buildings. Most missiles will fall within 1,500 feet.

CLASS 7 QUANTITY-DISTANCE TABLE

Quantity, Pounds of Explosives (Not Over)	Unbarricaded Distance[1] in Feet From Nearest			
	Inhabited Building[2]	Public Railway[2]	Public Highway[2]	Magazine
500,000[3]	1,800	1,800	1,800	300

[1] These distances will not be reduced by barricades. For concrete igloo magazines (except at the door end), one-half the above distances are authorized. When items of this class are stored in concrete igloo magazines (except when segregated into piles in accordance with drawing No. 19-48-12), the quantity and distance requirements prescribed for classes 9 and 10 will apply except that no distances less than one-half the distances quoted in the above class 7 Quantity-distance Table are authorized.
[2] Missile distance.
[3] Maximum permitted in any one magazine.

Class 8. Primers, detonators, primer-detonators for bombs, grenade fuzes, and blasting caps, packed in accordance with ordnance drawings and specifications. All in a magazine may explode at one time but as the total amount of explosives is limited, structural damage usually is limited to adjacent magazines. This class of ammunition forms light missiles which have a very limited range.

CLASS 8 QUANTITY-DISTANCE TABLE

Quantity, Pounds of Explosives (Not Over)	Unbarricaded Distance in Feet From Nearest			
	Inhabited Building[1]	Public Railway[1]	Public Highway[1]	Magazine
2,000	980	590	300	300
5,000	1,200	720	360	300
10,000	1,500	900	450	300
15,000	1,610	970	490	300
20,000[2]	1,740	1,040	520	300

[1] American Table of Distances, requirements for explosives in the form of blasting caps.
[2] Maximum permitted in any one magazine.

Class 9. Flashlight powder, demolition blocks, spotting charges, black powder, bulk priming explosives; bulk initiating explosives such as tetryl, and bulk high explosives such as TNT and explosive D. Priming explosives such as mercury fulminate and lead azide will be stored in accordance with special instructions to be issued by the Chief of Ordnance. In a fire, black powder usually explodes and TNT and explosive D usually burn, but may explode. Since these explosives are similar to commercial explosives on which the American Table of Distances was based, they are stored in accordance with this table.

AMMUNITION INSPECTION GUIDE

CLASSES 9 AND 10 QUANTITY-DISTANCE TABLE

Quantity of Explosives		Unbarricaded Distance in Feet From Nearest			
Pounds Over	Pounds Not Over	Inhabited Building[1]	Public Railway[1]	Public Highway[1]	Magazine[2]
.....	500	720	430	220	140
500	1,000	1,020	610	310	180
1,000	1,500	1,060	640	320	210
1,500	2,000	1,200	720	360	230
2,000	3,000	1,300	780	390	260
3,000	4,000	1,420	850	420	280
4,000	5,000	1,500	900	450	300
5,000	6,000	1,560	940	470	300
6,000	7,000	1,610	970	490	300
7,000	8,000	1,660	1,000	500	300
8,000	9,000	1,700	1,020	510	300
9,000	10,000	1,740	1,040	520	300
10,000	15,000	1,780	1,070	530	300
15,000	20,000	1,950	1,170	580	300
20,000	25,000	2,110	1,270	630	300
25,000	30,000	2,260	1,360	680	300
30,000	35,000	2,410	1,450	720	300
35,000	40,000	2,550	1,530	760	300
40,000	45,000	2,680	1,610	800	300
45,000	50,000	2,800	1,680	840	300
50,000	55,000	2,920	1,750	880	400
55,000	60,000	3,030	1,820	910	400
60,000	65,000	3,130	1,880	940	400
65,000	70,000	3,220	1,940	970	400
70,000	75,000	3,310	1,990	1,000	400
75,000	80,000	3,390	2,040	1,020	400
80,000	85,000	3,460	2,080	1,040	400
85,000	90,000	3,520	2,120	1,060	400
90,000	95,000	3,580	2,150	1,080	400
95,000	100,000	3,630	2,180	1,090	400
100,000	125,000	3,670	2,200	1,100	800
125,000	150,000	3,800	2,280	1,140	800
150,000	175,000	3,930	2,360	1,180	800
175,000	200,000	4,060	2,440	1,220	800
200,000	225,000	4,190	2,520	1,260	800
225,000	250,000[3]	4,310	2,590	1,300	800

[1] American Table of Distances, requirements for bulk explosives.
[2] Magazine distances conforming with the requirements of basic magazine quantity-distance rule page 810 may be authorized in special cases.
[3] Maximum permitted in any one magazine.
a One-half the above distances are authorized for concrete igloo magazines, except at the the door end.
b Distances applicable to fragmentation bombs will not be less than those stated in class 4 Quantity-distance Table.

Class 10. Demolition bombs; fragmentation bombs; photoflash bombs; H.E. antitank mines; offensive hand grenade, bangalore torpedo; Livins H.E. shell. All in a magazine may explode. In this case, structural damage will be limited to the distances specified for inhabited buildings in the American Table of Distances for similar quantities of commercial bulk explosives, and most missiles will also fall within these distances. Quantities of class 10 explosives will be stored in accordance with the table for class 9 and 10.

MAGAZINE AREA

Class 11. Chemical ammunition (except ammunition containing phosphorus). This ammunition is not considered an explosive hazard, and no limit has been placed on the storage of this material, except that storage must comply with the requirements presented in the chapter on storage of chemical ammunition.

Class 12. Explosives such as ammonium nitrate, DNT, and wet nitrocellulose. These materials are insensitive and can be detonated only by very strong initiation. When stored in an explosive area where there is a possibility that explosives may be projected into them, they will be stored in accordance with the regulations for class 9 explosives. When stored in an area with fire hazards only, and separated by inhabited building distances from areas containing explosives or ammunition, these materials may be stored in accordance with the regulations for smokeless powder.

Separation Within Magazines or Other Buildings. The quantity-distance tables for ammunition and ammunition components of classes 3, 4, 5, 6, and 7 are based on the assumption that on initiation, mass detonations will not occur, and that missile distances are the controlling consideration.

On initiation, ammunition of classes 3, 4, and 5 may be expected to explode progressively, a few boxes at a time, whether or not the piles are separated within the magazine.

Ammunition of class 6 stored in above-ground magazines, will be spaced in piles containing not over 5,000 pounds of explosives each, with the piles spaced a minimum of 2 feet apart. Otherwise, it must be assumed that, on initiation, the ammunition in the magazine will detonate en masse, and quantity-distance requirements including the maximum permitted in each magazine, will be those prescribed for classes 9 and 10. However, the limit per magazine will be 100,000 pounds, but not more than 50,000 fuzes of one model, nor a total of over 150,000 fuzes of all models will be stored in a single magazine.

Ammunition of class 7, stored in above-ground magazines, will be placed in piles containing not over 15,000 pounds of explosives each, and spaced in accordance with ordnance drawing 19-48-12. Otherwise, it will be assumed that, on initiation, all ammunition in the magazine will detonate en masse, and quantity-distance requirements including the maximum permitted in each magazine, will be those prescribed for classes 9 and 10.

When ammunition of classes 6 and 7 is stored in igloo magazines in accordance with ordnance drawings, aisle spacing is not sufficient to preclude mass detonation; therefore, quantity-distance requirements including the maximum permitted in each magazine will be those prescribed for classes 9 and 10.

Special Area Distances. In the lay-out of explosives manufacturing and ammunition loading plants, each operating line, storage area,

and administrative area will constitute a separate group of buildings and facilities, so located that any group is separated from all the others by inhabited building distances. The distance to be used in each case will be the greater of the following: Inhabited building distances based on the missile hazards for the particular type of ammunition being loaded (tables for classes 3 to 8, inclusive); or inhabited building distances based on structural damage for the total amount of high explosives involved (table for classes 9 and 10).

Public railways which do not carry passengers will be permitted to pass not closer than 400 feet from magazines. However, they must be separated by railway distances from operating buildings.

In future construction, railroad classification yards designed to receive explosives or ammunition will be separated from inhabited buildings, administration areas, magazines containing explosives or ammunition, and operating buildings containing explosives or ammunition, by a minimum distance of 1,800 feet. However, this distance may be decreased to a minimum of 1,400 feet in the case of concrete igloo magazines.

New depot storage areas will be divided into blocks of not to exceed 100 igloo magazines each, the blocks to be separated by minimum distances of 1,400 feet. Each block will contain not more than 25,000,000 pounds of explosives. Storage areas will be separated from administration and other inhabited building areas by inhabited building distances based on the quantities and types of ammunition and explosives contained in the magazine.

Renovation plants and reconditioning plants must be located at inhabited building distances from magazine areas. However, the inhabited building distance governing the location of such plants may in some cases be based upon the amount of explosives in the renovation or reconditioning plant rather than upon the amount of explosives in magazines in the magazine area.

In arranging the storage of hazardous material in above-ground (not concrete igloo-type) magazines, the following general principles should be followed as guides for preventing the spread of damage throughout an entire area in case of fire or explosion in one part of the area:

1. Smokeless powder or other materials which may become hazardous if the buildings in which they are stored are damaged or demolished, or which may be ignited or exploded by burning or exploding missiles, should be stored at inhabited building distances from high explosives and ammunition magazines.

2. Bulk high explosives, general purpose, or semi-armor-piercing bombs, should be stored so they will be protected from missiles which may be thrown from ammunition magazines as a result of explosions. This principle requires a magazine in which bulk high

explosive is stored to be at missile distance from a magazine in which ammunition is stored.

Loaded Railroad Cars. Cars of loaded ammunition such as shell, complete rounds, smokeless powder in containers, or propelling charges in containers, if alongside an operating building, are considered as separate rooms of that building. The space in the car opposite the open doors will not be used for storage, except under the following conditions:

1. Where it is possible to spot the car so that its doors are opposite a blank wall with a minimum of 5 feet on either side of the car door to the doors or windows of the building, such cars may be fully loaded.

2. Where doors and windows in a building prevent the solution suggested above, the car door adjacent to the building may be closed. Thus a dividing wall is interposed and the car may be fully loaded through the opposite car door.

If more than one car is located at an operating building, a separation of at least 10 feet between cars is required.

If nearer than magazine distance to an operating building, motor trucks or railway cars containing classes 2, 9, or 10 ammunition and explosives will be considered as part of the building and not within separate substantial dividing walls unless such walls are interposed between car and building. Cars containing these materials will not be located beside buildings unless the amount in the car plus the amount within all separate rooms or bays not protected by dividing walls against propagation through influence by the car, is within the explosive limit bases on distances to adjacent buildings.

Cars or trucks containing ammunition or explosives will not be spotted between magazines or other buildings where they reduce effective safety distances and may act to transmit fires or explosions from building to building.

Railroad cars used for picking up or distributing shipments in a magazine area must be loaded in accordance with the storage table, pages 870 and 871. Except when the quantity involved is very small, trucks so used will be loaded in accordance with the storage table referred to. The use of the Interstate Commerce Commission loading table is restricted to cars spotted at shipping or receiving buildings or moving between the shipping and receiving buildings.

Intraplant Distances. All high explosives and black powder operating buildings must be located one from the other, and from other buildings on explosives plants in which persons are regularly employed; all service magazines will be located from buildings on explosives plants in which persons are regularly employed in conformity with the intraplant quantity-distance table.

If the hazards involved require dividing an operating line into separate buildings, such hazards are great enough to require the use

of full intraplant distances between buildings unless effective separate barricades are provided, in which case these distances may be halved.

In cases in which it is impracticable, or undesirable from a production point of view, to separate operating buildings by prescribed safety distances, their separation by lesser distances may be approved by the commanding officer in special cases. Buildings so located will be considered as separate rooms within a single building, and the total

INTRAPLANT QUANTITY-DISTANCE TABLE[1]

Quantity of Explosives[2]		Unbarricaded Distance in Feet, Separate Building, or Within Substantial Dividing Walls
Pounds Over	Pounds Not Over	
.....	50	60
50	100	80
100	200	100
200	300	120
300	400	130
400	500	140
500	750	160
750	1,000	180
1,000	1,500	210
1,500	2,000	230
2,000	3,000	260
3,000	4,000	280
4,000	5,000	300
5,000	6,000	320
6,000	7,000	340
7,000	8,000	360
8,000	9,000	380
9,000	10,000	400
10,000	12,500	420
12,500	15,000	450
15,000	17,500	470
17,500	20,000	490
20,000	25,000	530
25,000	30,000	560
30,000	35,000	590
35,000	40,000	620
40,000	45,000	640
45,000	50,000	660
50,000	55,000	680
55,000	60,000	700
60,000	65,000	720
65,000	70,000	740
70,000	75,000	770
75,000	80,000	780
80,000	85,000	790
85,000	90,000	800
90,000	95,000	820
95,000	100,000	830
100,000	125,000	900
125,000	150,000	950
150,000	175,000	1,000
175,000	200,000	1,050
200,000	225,000	1,100
225,000	250,000	1,150

[1] New Jersey State law for intraplant quantities and distances.
[2] Applies to high explosives or items loaded with high explosives.

amount of explosives contained in all buildings so located will not exceed the maximum authorized for a single building.

In operating lines of explosives manufacturing or ammunition loading plants, subbuildings in which persons are not regularly employed or which are visited only intermittently by operators may be placed adjacent to operating buildings without affecting the safety distances determined by the main operating building, provided the maximum amounts of explosives contained in each subbuilding are limited by its distance from the nearest main operating building in accordance with the intraplant quantity-distance table.

The maximum amount of explosives permitted in operating buildings or between substantial dividing walls as prescribed by the intraplant quantity-distance table is the top limit for the distance specified, and this limit must not be exceeded under any circumstances without the specific approval of the Chief of Ordnance. In many cases, the quantity specified will be excessive in view of conditions surrounding individual operations; therefore, it is mandatory that local limits be established at amounts no greater than those consistent with continuous and efficient operation. Local limits must specify the maximum number of specific units or items in addition to the quantity in pounds. In cases where the weight of items is too small, or where operations are changed too frequently to make it feasible to express the limits in units, the limits may be specified in pounds only. These limits must be posted in a conspicuous place in each room or building. If the operation is changed to another item of ammunition, the unit limits must be changed accordingly before operations may proceed.

Operations will be so arranged, and personnel will be utilized in such a manner that the least number of men consistent with continuous and efficient operation will be exposed to any one explosion hazard. Local limits for personnel will be established for each room, and will be posted in a conspicuous place in the room.

Basic Magazine Quantity-distance Rule. The laws of New Jersey (latest revision, ch. 27, Laws of 1941, March 28 1941) require a distance of 200 feet separation for magazines containing 5,000 to 25,000 pounds of explosives, plus 2⅔ feet additional distance for each 1,000 pounds of explosives in excess of 25,000 pounds. This rule is the basis for the table shown for quantity-distance classes 9 and 10, but for reasons of policy the latter table shows only three magazine distances for quantities varying from 5,000 to 250,000 pounds. This basic rule is restricted to intraplant use in locating service magazines from each other and to such other uses as may be authorized by the Chief of Ordnance in specific cases.

FURTHER REFERENCES: Ordnance storage drawings; Ordnance Safety Manual: TM 9-1900, Ammunition General.

AMMUNITION INSPECTION GUIDE

Chapter 3

Storage of Chemical Ammunition

GENERAL.

The term "chemical ammunition" is used to designate a variety of forms of artillery shell, chemical mortar shell, Livens projector shell, bombs, grenades, candles, and containers which contain chemical agents.

Grouping of Fillings. For the purpose of storage, chemical ammunition is divided into four groups according to the nature of the fillings. These groups together with their fillings, are as follows:

C.W.S. Symbol	Name
Group A—Persistent Vesicants	
H	Mustard
L	Lewisite
ED	Ethyldichlorarsine
Group B—Toxic and Smoke	
PS	Chlorpicrin
DP	Diphosgene
CG	Phosgene
Cl	Chlorine
CN	Chloracetophenone
CA	Brombenzylcyanide
DM	Adamsite
DA	Diphenylchlorarsine
FS	Sulphur trioxide solution
FM	Titanium tetrachloride
Group C—Spontaneously Inflammable	
WP	White phosphorus
Group D—Incendiary and Readily Inflammable	
TH	Thermite
HC	Hexachlorethane mixtures
CN	CN burning mixture
DM	DM burning mixture
CN-DM	CN-DM burning mixture

CN and DM as listed in group B refers to these chemicals in bulk or as chemical filling in shell. In group D, the chemicals are mixed with small-grain smokeless powder as a filling for grenades.

General Rules. The general rules as to magazines and storage, as set forth in the preceding chapters must be followed with the exceptions and additions which apply specially to chemical ammunition.

Whenever possible, each kind of material must be stored separately. However, unless specifically prohibited, munitions of the same group may be stored together. Munitions of two or more groups of

MAGAZINE AREA

fillings may not be stored together except upon the specific approval of the Chief of Ordnance.

Chemical ammunition must be stored in accordance with current ordnance drawings except for those lots for which special instructions are issued by the Chief of Ordnance.

Ammunition must be handled carefully. It must not be dropped or unnecessarily jarred. The same mechanical equipment for handling may be used as that used for high-explosive shell of the same size and weight.

In any temporary emergency necessitating storage outdoors overnight or for a longer period, chemical ammunition must be covered with a tarpaulin to protect it from the direct rays of the sun and from rainfall. Ammunition must be piled to permit free circulation of air.

The 1-ton containers should be stored, preferably under a shed or other open side protection, to allow handling with a crane. The shed should be of sufficient size to protect containers from rain. If stored in an open shelter, containers must be supported from the ground.

Chemical ammunition must be inspected at regular intervals, at least semiannually, to determine the condition of the paint or other rust-preventing covering. If deterioration is found, immediate corrective methods must be taken.

Report on Leaking Ammunition. Any chemical ammunition found to be damaged or leaking, must be reported immediately to the officer in charge of the magazines.

A report must be made to the Chief of Ordnance on all chemical ammunition found in a damaged or leaking condition. This report will include the following data:

1. Type and amount.
2. Lot number.
3. Date discovered.
4. Detailed information covering the nature of the leak, and whether it appeared to have been caused by defective material or improper handling or packing.
5. Disposition, or in the event that immediate disposition is not required, recommendations for such disposition.

A copy of this report must be forwarded direct to the Chief, Chemical Warfare Service.

Report of Injuries. Injury reports in duplicate prepared in accordance with existing regulations are forwarded promptly to the Chief of Ordnance, who will forward one copy to the Chief, Chemical Warfare Service.

Special Equipment. The extreme danger involved in working with chemical ammunition cannot be overemphasized. Because of this

danger all personnel who work in magazines or buildings assigned to chemical storage must be provided with appropriate protective equipment.

Where special equipment is placed as called for under the special rules for the storage of the various groups of chemical ammunition, a list is posted showing the quantity of each item required. This special equipment must be replenished as required to maintain the full quantity in serviceable condition.

All required special equipment must be so marked as to preclude possible misapplication.

Special equipment should be inspected to note condition and compliance with rules at each regular inspection of the magazines for which the equipment is provided.

Protection of Personnel. Protective and first aid equipment must be provided for those employees handling defective or leaky chemical ammunition.

Protective equipment which has become unserviceable will be promptly replaced. The officer in charge of each establishment in which protective equipment is on hand will have this equipment inspected as often as is necessary to insure serviceability.

Personnel must wash their hands thoroughly with soap and water after handling chemical ammunition and particularly before eating.

Signs on Magazine Doors. There must be posted on the doors of all magazines containing chemical ammunition appropriate signs such as shown below:

Signs for group A chemical ammunition magazines. "This magazine contains chemical ammunition of group A (blistering agents). Complete protective equipment must be worn to avoid burns, if leaking ammunition is present."

Signs for group B chemical ammunition magazine. "This magazine contains chemical ammunition of group B (toxic and smoke agents). Mask must be worn if odor is present."

Signs for group C chemical ammunition magazines. "This magazine contains group C chemical ammunition (spontaneously inflammable). If fire breaks out, put on asbestos or heavy leather gloves and place burning component in water."

Signs for group D chemical ammunition magazines. "This magazine contains group D chemical ammunition (incendiary and readily inflammable). Don't use water on fires in this building."

GROUP A CHEMICAL AMMUNITION (PERSISTENT VESICANTS).

Description of Group A Fillings. Mustard (H) as filled in munitions is a liquid, dark brown to black in color, melting at 46 F to 50 F. Its odor is rather faint and somewhat like horseradish or garlic. Its

action is that of a vesicant or blistering agent. The liquid or vapor causes intense inflammation which may proceed to blistering of any skin or membrane with which it comes in contact. It causes reddening of the eyes, burning of the nose and throat, inflammation of the trachea and lungs, and burning or blistering of the skin. These symptoms develop 4 to 24 hours after exposure, thus giving no warning that a person is being burned. An extremely slight concentration will cause very severe burns. It can be detected by its odor in any concentration likely to produce burns. However, one rapidly becomes accustomed to the odor so that after a few minutes' exposure the smell is no longer noticed. When a dangerous concentration of mustard is detected, it is absolutely essential that all unprotected personnel leave the magazine at once. Any work done thereafter should be performed by men completely protected, wearing gas masks, protective clothing, protective gloves or mittens, and protective shoes or boots.

Lewisite (L) like mustard has strong vesicant properties and is a powerful lung irritant. Its vesicant action is not delayed, however, and the blisters differ in appearance from those produced by mustard. Lewisite, being an arsenous compound, has the additional property of entering and poisoning the blood stream. It is classed as a persistent agent, but is readily hydrolized by water. However, the hydrolysis product formed is itself a vesicant and very toxic, and contaminated areas will remain dangerous for a long time. Lewisite when pure is a colorless or slightly yellow liquid, but the product as usually prepared is a dark green oily liquid. It has a faint but unpleasant odor which resembles geraniums. The vapor causes a very disagreeable burning sensation in the nose and throat, and sometimes violent sneezing. This material is practically insoluble in water, but is readily soluble in absolute alcohol, benzene, kerosene, olive oil, liquid petrolatum, and other solvents. Woolen clothing gives some protection against L vapor. Wet wool absorbs more than dry wool, hydrolysing the L. Most closely woven rubberized fabrics, as well as leather and rubber, offer little resistance to penetration by liquid L. Lewisite is destroyed by an alcoholic solution of caustic soda. Chloride of lime may be used to destroy it in the field. L does not attack steel appreciably, and no special lining is necessary for shells.

Storage. Ammunition and components with group A filling may not be stored in magazines with wooden floors. They, preferably, should be stored in magazines with concrete floors. The floor should be treated with sodium silicate to render it nonabsorbent. The use of rubberoid or other such floor covering is prohibited. At all ordnance depots and storage points, ammunition of class A must be stored in fireproof magazines.

The slight odor of mustard or Lewisite in a magazine may not always indicate the presence of leaking ammunition. However, excessive concentrations of fumes do indicate leaking ammunition.

AMMUNITION INSPECTION GUIDE

Foremen, inspectors, or other authorized persons who are thoroughly familiar with work in magazines containing these agents must be present when a magazine is opened in order to determine whether or not the magazine contains leaking ammunition.

If it is decided that a magazine contains leaking ammunition, all personnel must put on protective clothing and equipment before they enter the magazine. All windows and doors of the magazine must be opened and a search conducted under the direct supervision of some responsible officer or foreman until the leaking ammunition is located.

Unboxed ammunition or containers filled with H (or L) must be handled only by personnel wearing protective gloves or mittens.

The officer in charge of the storage of munitions in this group will cause frequent inspections to be made to insure compliance with regulations and to ascertain if leaking ammunition is present.

Some unboxed shell now in storage are covered with cosmoline. These should not be set on readily combustible material such as wood because, in warm weather, this coating impregnates the wood, thereby increasing the fire hazard.

Special Equipment. The following protective equipment will be made available when men are working in magazines where this material is stored:

1. Service gas masks.
2. Protective clothing.
3. Protective footwear.
4. Protective gloves or mittens.
5. Commercial bleach or chloride of lime (calcium oxychloride containing not less than 35 percent chlorine). 100 pounds for each ton of H up to a total of 2 barrels of bleach should be supplied.
6. Iron tanks of such size as will readily contain the largest shell or container in storage.
7. First aid equipment to include: 20 tubes Protective Ointment M1 or M4; 3 dozen clean flannel, or cotton cloths, 1 square foot or equivalent; 1 pint of a solution consisting of 10 percent sodium hydroxide, 30 percent glycerin, and 60 percent water, to be labeled, "For Removal of Lewisite—External Use Only. Do not Use In Eyes"; one syringe, or douche cup; 1 nose cup; a supply of soap and water, a 1 percent sodium bicarbonate solution, a saturated solution of boric acid.

The sodium bicarbonate solution and the boric acid solution will freeze during the winter months. In this case, the requisite amounts of sodium bicarbonate or boric acid should be kept in a 1 pint bottle or jar; labeled and corked. To use, fill with water and shake thoroughly, after which it may be applied as directed.

MAGAZINE AREA

First Aid. In case of exposure to any of the agents in group A, the proper first aid measures must be observed as set forth in the section covering the agents themselves. First aid must be prompt, however, for little can be done later than 20 to 30 minutes after exposure.

Leaking Ammunition. When leaking ammunition or components are located, they will be disposed of at the direction of the officer in charge.

At all times during the handling or disposal of leaking ammunition, adequate protective clothing and equipment will be worn by each person so engaged.

A leaking shell or component will be immersed in freshly prepared bleach solution and then removed down wind from the magazine area. The bleach solution should be prepared in iron tanks large enough to contain the shell in question. The solution is made up 3 pounds of chloride of lime to each gallon of water thoroughly mixed.

The methods for the final disposal of the leaking shell will be found in the section covering demolition.

Leaking Containers. The officer in charge of the magazine, or other responsible officer, will be notified whenever a shipping container is found to be leaking. He will take direct personal charge of removal.

In general, shipping containers are too large to immerse and handle like a leaking shell. Therefore, an attempt should be made to stop the leak by one of the methods set forth in the Ordnance Safety Manual.

Leaking containers will be disposed of, in general, by transferring the contents to a serviceable container. The transfer of contents will be done only by specially trained depot personnel after authorization from the Chief of Ordnance, or when in the opinion of the commanding officer of the depot immediate action is required. A leak which cannot be stopped should be considered as requiring immediate transfer of the contents of the container.

Removal of Spilled Material.

Mustard. If mustard from a leaking shell or container has contaminated the floor or other containers, it should be removed by washing thoroughly with freshly prepared bleach solution. If woodwork is stained, it should be removed and burned, as no simple treatment will remove mustard from wood.

After washing metal containers, shell, or concrete floor with bleach solution, dry bleach should be applied and allowed to remain for several days, after which it should be swept up and daily applications of alcoholic caustic made over a period of 2 weeks. If it is impracticable to use alcoholic caustic, freshly prepared bleach solution may be substituted.

985616 O 52 32

Alcoholic caustic should not be used without consideration of possible later danger from the contact of loose high explosives with caustic, which undoubtedly will remain in the floor.

The doors and windows of the magazine should remain open until the odor of mustard has disappeared. Complete protective equipment must be worn while conducting any of this work and at all times thereafter until the mustard and its odor have been removed from the magazine.

In the event that the above-described treatment does not remove all mustard from the floor, the treatment must be repeated. If repetition does not suffice, the only course available is to remove the contaminated portion of the floor and replace with new material. Protective clothing must be worn during such removal.

Lewisite. Decontamination for lewisite essentially parallels that for mustard. Like mustard gas, lewisite is almost immediately decomposed in the presence of alkalies such as caustic soda (5 percent solution) or ammonia, and by active oxydants, such as chloride of lime and the hypochlorites. While lewisite is readily decomposed with water, the reaction product is a vesicant solid that will cause severe burns upon contact with the body.

GROUP B CHEMICAL AMMUNITION (TOXICS, IRRITANTS, AND SMOKE).

Description of Group B Fillings. Phosgene (CG) is normally a colorless liquid. It boils at 47 F and has an odor resembling ensilage, or fresh-cut hay. On inhalation, it causes pulmonary edema, or an accumulation of water in the lungs, as a result of the irritant action of the chemical. The first symptoms noted in a strong concentration are a choking sensation and a feeling of constriction in the chest. However, the danger lies in the fact that low concentrations that are not particularly irritating may, after an interval of hours, produce serious symptoms, and even death. Among these symptoms are difficulty in breathing, rapid pulse, weakness, coughing with watery expectoration, and cyanosis (a blue color of the skin), caused by the inability of the lungs to oxygenate the blood.

The delayed action of phosgene makes it imperative that masks be worn whenever the odor is present. Further, because of its extremely rapid action in high concentrations, gas masks always must be readily available while working with shell or containers filled with phosgene.

Chlorpicrin (PS) is a colorless liquid boiling at 234 F. It has a sweet odor like sticky flypaper and causes irritation of the eyes with lacrimation and some irritation of the nose and throat. Its action is that of a lacrimator and suffocant. In a strong concentration, it is nauseating. The first effects are followed by pains in the chest, abdominal discomfort, and vomiting. The principal action, however, is

on the lungs (pulmonary edema). Prolonged exposure to very low concentrations may cause serious symptoms. Pulmonary edema does not develop until several hours after exposure to the gas.

The delayed effect of this agent necessitates the same availability of masks as prescribed for phosgene. A distinct odor and irritation of the eyes is noticed readily in any concentration which would be dangerous.

Brombenzylcyanide (CA) is a liquid, dark brown in color, which causes intense irritation of the eyes, followed by a prompt flow of tears. Lacrimation does not produce any permanent damage to the eyes, and this chemical has apparently no other effect on the system. Comfort of the worker will require wearing of the mask when in any concentration of this material.

Adamsite (DM) is a greenish-yellow to black solid melting at 383 F. It causes irritation in the nose and throat even in minute concentrations. Longer exposure causes tightness of the chest, sneezing, headache, coughing, intense nausea, and weakness. The symptoms increase in severity some time after exposure. The irritation produced by the smoke of this agent while burning is so intense that an intolerable concentration is reached long before it becomes dangerous to life. The effects may last for several hours, but no permanent injury is caused.

Diphenylchlorarsine (DA) is a solid varying in color from white to black which melts at 111 F. The crude material may be liquid in some cases. Its properties and action are the same as those of Adamsite.

Titanium Tetrachloride (FM) is a heavy, colorless liquid with a pungent odor. It can be readily detected by the large quantity of smoke produced when it leaks. It is used solely as a smoke-producing agent and has practically no toxic effects. Large quantities of the smoke produce a choking sensation and difficulty in breathing, requiring a gas mask for the comfort of the worker.

Chloracetophenone (CN) is a white to gray or black solid, melting at 138 F. It is a powerful lacrimator and has a somewhat fruity odor. Usually it is put in candles with smokeless powder to cause it to burn, or filled in liquid form in which CN is dissolved in suitable solvents. In solution, the odor of the solvent is usually discernible in addition to that of the chloracetophenone itself. In any case it is a strong lacrimator but does not cause permanent damage to the eyes. Its lacrimatory effects require the use of masks for the comfort of workers.

Chlorine (Cl) is a greenish-yellow liquid or gas boiling at 30 F. It has a pungent odor. The first effects produced by the inhalation of small proportions of chlorine is an active irritation of the upper respiratory passages, causing coughing and a sensation of suffocation which is extremely disagreeable. The odor of chlorine is very strong

in any concentration that would cause irritation or symptoms of poisoning. When present in amount strong enough to cause irritation, masks should be worn and all personnel not so equipped should leave the vicinity.

Sulphur trioxide-chlorsulphonic acid mixture (FS) is a heavy mixture which fumes strongly in air, and decomposes above 68 F. It has an acid odor. It is used solely as a smoke-producing agent, and there is no evidence that it is harmful to man in concentrations normally attained in the field. Inhalation of concentrated fumes causes coughing and strangulation; a feeling of constriction around the chest, burning of the nose and throat, and hoarseness. When the mixture comes in contact with moisture, it forms hydrochloric acid and sulfuric acid, thus making it very corrosive to metals and to fabrics of various kinds. If applied directly to the skin, a burning sensation is felt at once and an acid burn follows.

Chloracetophenone-chloroform-chlorpicrin (CNS) is a solution of chloracetophenone, chlorpicrin, and chloroform. Its odor is somewhat like that of sticky flypaper. In strong solution, it may cause nausea in addition to severe lacrimation. An individual exposed to extremely high concentrations for a relatively short time may suffer serious effects such as pains in the chest, abdominal discomfort, vomiting, and an action upon the upper air passages and bronchial tubes similar to, but less than that of chlorine. Prolonged exposure, even to a very low concentration, may cause these effects. CNS has only a slight action on metals.

Chloracetophenone-benzol-carbon tetrachloride (CNB) is a solution of chloracetophenone in benzene and carbon tetrachloride. This solution should not be permitted to come in contact with the skin or eyes because of the considerable discomfort and possible injury that may result. It has no appreciable action on metals.

Storage. Ammunition and components with group B filling may not be stored in magazines with wooden floors. Preferably, they should be stored in magazines with concrete floors. The floor should be treated with sodium silicate to render it nonabsorbent. The use of rubberoid, or other such floor covering is prohibited. At all ordnance depots and storage points, munitions of group B must be stored in fireproof magazines.

Whenever a magazine containing group B chemical ammunition is opened, a foreman or other responsible person familiar with work in magazines containing this material must be present to determine whether munitions in the magazine are leaking. If it is decided that munitions in the magazine are leaking, masks must be worn and the doors and windows must be opened after which the leaking component should be located.

Masks should be readily available to all men working in these magazines. Unboxed shell and containers may be handled without

protective gloves unless contamination is noted. However, in some cases, a small amount of filling may be left on the outside of a shell during the filling of group B munitions. Protective gloves or mittens should be worn when handling contaminated material.

Special Equipment. The following protective equipment will be made available when men are working in magazines where this material is stored:

1. Service gas masks.
2. Protective gloves or mittens.
3. Stretchers or litters.
4. Woolen blankets.
5. Eight ounces of a mixture consisting of 4 ounces of pure grain alcohol (95 percent), and 4 ounces of chloroform, U.S.P., to which is added a few drops of ammonia.
6. One carboy of a saturated solution of sodium sulphite in pure grain alcohol (95 percent). This carboy must be kept sealed to prevent evaporation. This solution is for use in treating burns on the skin from liquid chlorpicrin and chloracetophenone.

One carboy of a saturated solution of sodium hydroxide (caustic soda) in pure grain alcohol (95 percent). This carboy must be kept sealed to prevent evaporation. This solution is for use in removing brombenzylcyanide from magazine floors or munitions, but is not to be used on personnel under any circumstances.

Leaking Ammunition. When leaking ammunition or components are located, they must be disposed of at the direction of the officer in charge.

A gas mask and protective gloves will be worn whenever handling leaking ammunition filled with group B material. Care should be observed that the leaking material does not come in contact with skin or clothing.

Pending final disposition, leaking ammunition will be removed from the magazine.

If the number of leaking shell or components is small, they should be disposed of by one of the methods described in the chapter on demolition. If a large number of shell is involved, the magazine should be ventilated, placed under guard, and the Chief of Ordnance notified by telephone or telegraph.

Leaking Containers. The officer in charge of the magazine will be notified whenever a shipping container is discovered to be leaking. He will inspect the container involved to determine proper disposition.

As soon as possible after discovery of a leaking container, and pending arrangements for its removal, attempt should be made to place the container in a position to prevent the contents from spilling

on the floor or on other containers. If possible, this should be done by the man discovering the leak.

If the leak is stopped easily without allowing a large quantity of the filler to escape, the container may remain in the magazine. If the leak is not stopped promptly, the container must be transported downwind from the magazine area.

Containers in which the leaks have been stopped in such manner as, in the opinion of the magazine officer, renders them serviceable for continued storage may remain in the magazine. Containers which cannot be repaired satisfactorily with the facilities at hand will have the contents transferred to serviceable containers under the direct supervision of the magazine officer. The method of transferring contents will vary with existing conditions and the nature of the material.

Removal of Spilled Material. Gas masks and protective gloves must be worn when removing group B chemical fillings which have spilled.

Phosgene if spilled will, if left alone, quickly and completely evaporate. The addition of water will cause the phosgene to break down into other substances not harmful.

Chlorpicrin can be removed only with great difficulty, especially from woodwork. The most effective treatment is by means of scrubbing with a liberal application of alcoholic sodium sulphite solution.

Brombenzylcyanide is extremely difficult to remove from any surface which absorbs it. The liberal use of alcoholic caustic soda solution tends to reduce the nuisance caused by the presence of the lacrimatory material in a magazine. It should be noted that under many conditions the use of caustic soda in a magazine will be impossible because of the possible effect of the caustic on high explosives which might later be stored in this magazine, or on the bursting charge of chemical munitions.

Adamsite, if spilled, may be removed by first wetting thoroughly and then sweeping up with a broom. It should not be swept or handled in any way to cause dust formation.

Titanium tetrachloride can be removed easily by the application of large quantities of water.

Chloracetophenone can be removed best by scrubbing with soap and water, followed by liberal applications of alcoholic sulphite solution, or by the use of sulphite solution alone.

Chlorine can be removed by ventilation.

Sulphur trioxide-chlorsulfonic acid mixture can be removed by the application of large quantities of water.

GROUP C CHEMICAL AMMUNITION (SPONTANEOUSLY INFLAMMABLE).

Description of Group C Fillings. White phosphorus (WP) is a yellowish, translucent, wax-like substance, melting at 111 F. Its most

characteristic property is that of spontaneously igniting upon exposure to air, burning with an intensely hot flame, and giving off large volumes of white smoke. The fumes are not toxic except on exposure for a period of several months. Phosphorus is intensely poisonous when taken internally. Precautions should be taken to insure that none is taken into the body.

Storage. Chemical ammunition containing group C fillings must be stored in fireproof magazines with concrete floors. The preferred storage is in igloo magazines. It must be stored in accordance with current ordnance drawings, where applicable, except for those lots for which special instructions are issued by the Chief of Ordnance. In any case, ammunition containing white phosphorus must be stored in such a manner as to permit easy inspection.

The white phosphorus filling in ammunition or components becomes liquid at 111 F. At or above this temperature, defective ammunition may leak, and may catch fire, and in some cases (where a burster was in place) has been known to explode. Below 111 F the filling is solid, and shell will not leak. It is highly important, especially where this ammunition is stored on its side, that the temperature at which it is stored be kept below 111 F.

Special Equipment. There must be maintained at all times adjacent to each magazine in which group C chemical munitions are stored the following special equipment:

1. Heavy rubber gloves (gauntlet type).
2. Rubber boots.
3. Rubber aprons (ankle length) or leather blacksmiths' aprons.
4. A number of tubs, barrels, or tanks large enough to contain the storage unit. During the summer months, when fires are most likely in this type of ammunition, these tanks must be kept filled with water.
5. Two sponges and a pail or other vessel holding approximately 5 gallons.
6. A bathtub or similar container for first aid, and a means of heating water for use therein, must be maintained in some heated building as close as possible to the magazine of this group. Also a small number of gauze sponges should be maintained.
7. One bottle containing at least 1 gallon of 3 percent copper sulphate solution.

Leaking Ammunition. With leaking shell of this group, the great risk is that of fire. This can be combatted successfully only by prompt action. In general, the time elapsing from the time the fire is reported until the arrival of the fire department is sufficient to allow the fire to get beyond control.

A leaking shell or container of any type should be immersed immediately in one of the tubs provided at the magazine. The person discovering the leaking shell should put on rubber gloves and attempt to immerse it at once. In the event that this action is impracticable,

the hose, if available, should be used with hydrant pressure. This is important, as a low-pressure stream of water will tend to smother the fire, whereas high pressure tends to scatter the fire over a large area, and thus greatly increases the difficulty of extinguishing it.

Rubber gloves will give protection against burns only, as they prevent contact of the phosphorus with the skin. Gloves are not effective when exposed to high temperatures, such as burning phosphorus. When burning phosphorus adheres to gloves, it can be extinguished by dipping the gloved hand in water.

When a single leaking shell has been discovered and immersed in water, it should be destroyed at a place where fragmentation will not be a hazard, smoke will not create a nuisance, and there is no dry vegetation which may be ignited.

Where the ammunition is packed in a container, and is fitted with either fuze or burster, the fire will be fought with water from outside the magazine. Defective shell must be removed if and when the fire is extinguished. If the leaking shell is removed, subsequent action will be taken to destroy it.

Removal of Spilled Phosphorus. Where phosphorus has leaked on the floor or other parts of a magazine and has been extinguished, a fire guard must be stationed within the building until it has been completely removed, as the drying up of the water will permit the phosphorus to ignite again.

Small amounts of phosphorus can be removed best by first scraping off as much as possible with an implement such as a putty knife and then removing the rest with a blowtorch or similar implement. This removal of phosphorous must not be attempted until all loaded ammunition has been removed.

After treatment the magazine should be kept under surveillance for at least 2 weeks, as fire may break out again. Portions of the floor containing deep cracks or crevices must be grouted with mortar before munitions are restored in the magazine.

GROUP D CHEMICAL AMMUNITION (INCENDIARY AND READILY INFLAMMABLE).

Description of Group D Fillings. Thermit (TH) is a mixture of iron, oxide, and aluminum. It is in the form of a dark-gray granular mass. When ignited, it burns with great rapidity and the evolution of extreme heat, the iron oxide being reduced to boiling molten iron.

Hexachlorethane mixture (HC) consists largely of hexachlorethane and zinc. It is a gray solid with a camphor-like odor. It burns rather slowly with the evolution of a dense cloud of smoke. The smoke produced is harmless and can be breathed without discomfort.

Incendiary bombs comprise a combustible body of magnesium metal, inside of which is an igniter composition such as thermit. When ignited, the body of the bomb burns with intense heat.

Chloracetophenone burning mixture (CN) is a mixture of CN and small grain smokeless powder. It is employed in hand grenades. It is most effective when distilled into the air by the heat of a burning composition.

Diphenylaminechlorarsine burning mixture (DM) is a mixture of DM and smokeless powder. Like CN, diphenylaminechlorarsine is most effective when disseminated as a smoke.

Burning mixture CN-DM is a mixture of chloracetophenone and diphenylaminechlorarsine with smokeless powder.

Storage. Chemical munitions containing fillings of group D may be stored in any dry, fireproof magazine.

Inspection and guard of ammunition of this type should be the same as that maintained for high-explosive shell.

Special Equipment. Unboxed ammunition containing group D material may be handled with special protective equipment. Some suitable equipment for fighting oil fires should be maintained at all times adjacent to magazines in which material of this class is stored.

Leaking Ammunition. In the event that containers of shell containing group D materials are discovered in a leaking condition they should be segregated. Instructions as to the disposition of such shell will be requested from the Chief of Ordnance.

Leaking munitions of this group may be destroyed, if necessary, by burning in the same manner as intended for service use, but in the case of bombs, statically, in an area where fire risk is negligible.

Removal of Spilled Material. In the event that components are broken open or leaking, the material should be swept up, removed from the building, and burned.

FIRES IN MAGAZINES CONTAINING CHEMICAL MUNITIONS.

Group A. If a fire breaks out in any building in which group A fillings are stored, all personnel should be removed from the downwind side of the magazine, as the vapors will undoubtedly be carried in the smoke as soon as the shell begins to open. If any large quantity of the material is likely to be released by such a fire, all possible means must be employed to notify inhabitants downwind from the fire. If possible, they should be moved to some locality other than downwind.

If it is impossible to move personnel, they should, as a last resort, take shelter in rooms not having a flue connection, and should stuff all openings to prevent ingress of the fumes. The danger zone for unprotected personnel during a fire must be estimated at the time by careful observation of smoke and presence of fumes.

Men fighting the fire should wear complete protective outfits. The attack on the fire should be made from the upwind side, if practicable; but, in any event, the fire must be extinguished at all costs.

The immediate area in which any shell have opened during a fire

will undoubtedly be contaminated, and should be treated as such. Any shell which has been exposed to fire should be considered as dangerous and made the subject of special inspection to ascertain its condition.

Group B. If a fire breaks out in any building in which group B munitions are stored, all personnel should be removed from the down-wind side of the magazine. All personnel fighting the fire should wear gas masks.

The same precautions of notifying inhabitants down-wind from the fire should be taken as in group A. The danger to personnel down-wind is much less, however, than in the case of a fire involving group A fillings.

Any shell or container which has been exposed to fire should be considered dangerous and made the subject of special inspection to ascertain its condition. A report should be made to the Chief of Ordnance and instructions should be requested.

Group C. In the event of fire getting beyond control of the person discovering it, the following precautions, not generally necessary during ordinary fires, must be observed in order to attack the flames successfully.

Phosphorous once extinguished must either be immersed under water or must be continually sprayed to prevent the flames from breaking out anew.

Due to the great amount of smoke liberated, there is an extra hazard of men becoming lost in the magazine while attempting to fight the flames. Men with portable extinguishers should not be permitted in the magazine after a fire gains headway unless they are equipped with life lines, as they would have no hose line to follow back in order to escape from the magazine.

The fact that components becoming highly heated in a fire will explode with moderate violence, thus throwing the burning containers for some distance, tends to spread the fire rapidly.

As a high velocity stream of water tends to spread the fire, the lowest possible pressure stream consistent with possibility of approach should be used.

After a fire has been extinguished in a magazine, all adjacent shell and components must be considered dangerous and a report of the fire must be made immediately to the Chief of Ordnance.

Group D. The efforts of fire fighters should be confined to preventing the spread of the fire. Fire in a magazine containing group D material in any form should not be fought with water.

Unburned material in a magazine which has been partially destroyed by fire should be treated with the greatest caution, as HC mixture may absorb sufficient moisture to cause ignition with consequent recurrence of the fire.

SECTION 9:

FIRST AND LAST SHIPPING RECORDS FROM THE GOLDEN CARGO TRANSPORTATION UNIT FROM MCALESTER ARMY AMMUNITION PLANT DEFENSE AMMUNITION CENTER, OF THE JOINT MUNITION COMMAND'S MOBILE AMMUNITION RENOVATION, INSPECTION, AND DEMILITARIZATION (MARID) TEAM

JMC Mobile Ammunition Renovation, Inspection and Demil
(RAVENNA AAP SITE)

WEEKLY REPORT

13-Dec-04

REPORTING DATES: DEC 5 -DEC 11, 2004

PRODUCTION		PERSONNEL	
TRAILERS LOADED	65	ASSIGNED	28
TRAILERS SHIPPED	59	HOURS	21112
BUILDINGS EMPTIED	0	TRAVEL	40
BUILDINGS CLEANED	0	HOLIDAY	0
NEW	1,044,384	ACTUAL WORKED	21072
GROSS	1,369,584		

CUMMULATIVE TOTALS for 2003

TRUCKS	NEW	GROSS	M/H
396	8,411,601.00	10,721,793.00	18,418.15

CUMMULATIVE TOTALS for 2004

TRAILERS LOADED	1975		M/H
TRAILERS SHIPPED	1954		83,711.00
BUILDINGS CLEANED	358		
TOTAL NEW	53,046,928		
TOTAL GROSS	63,078,706		

CUMMULATIVE TOTALS 2003-2004

TRAILERS LOADED	NEW	GROSS	M/H
2371	61,458,529	73,800,499	102,129.15

TOTAL BLDGS EMPTIED AND CLEANED 2003 - 73

TOTAL BLDGS EMPTIED AND CLEANED 2004- 330

CUMM. BLDGS EMPTIED AND CLEANED 2003-2004 - 431

* TRUCKS SHIPPED NOW REFLECTS ALL CONSIGNEES

** TOTAL SHIPPED AS OF DEC 11, 2004 =2349

WEEKLY PRODUCTION REPORT

DATE: 25 Aug 03

WEEKLY PRODUCTION

TRAILERS LOADED	**12**
TRAILERS SHIPPED	**2**
BUILDINGS EMPTIED	**0**
BUILDINGS CLEANED	**6**
TONNAGE (NEW)	**67,680**
TONNAGE GROSS	**72,192**

PERSONNEL ASSIGNED

27

HOURS WORKED

1824

CUMMLATIVE TOTALS

TRAILERS SHIPPED	**2**
BUILDINGS CLEANED	**6**
TOTAL TONNAGE (NEW)	**67,680**
TOTAL TONNAGE GROSS	**72,192**

CUMMLATIVE HOURS WORKED

1824

MISC/COMMENT

SECTION 10:

HISTORY OF RAVENNA ARMY AMMUNITION PLANT PREPARED BY GAIL HARRIS (VISTA SCIENCES CORPORATION)

History of the Ravenna Army Ammunition Plant

1940

- On August 26, 1940 contract W-ORD-463 was entered into between the United States Government and the Atlas Powder Company[1]. The Ravenna Ordnance Plant was built in the northeastern portion of Ohio in Portage and Trumbull Counties.
- In September, 1940 the Atlas Powder Company became the first operating contractor of the plant.
- Under Title I of this contract, the Atlas Powder Company received a lump-sum fixed fee for management services in planning, designing and organizing the Ravenna Ordnance Plant for operation.[2]
- Under Title II, the Atlas Powder Company, as an independent contractor, operated the plant and received operating costs plus a fixed fee.[3]
- August 30, 1940 collateral contracts were awarded by the Government to Wilbur Watson and Associates and the Hunkin-Conkey Construction Company, both of Cleveland, Ohio.[4]
- The original property of the Ravenna Ordnance Plant comprised about 17,000 acres. Later purchases included 283 acres and 1,405 acres, the latter located in Trumbull County. These additions do not include land purchased by the Field Service Branch for the Portage Ordnance Depot.[5]
- The government selected the Atlas Powder Company to operate the plant and to manage, supervise, direct and control the engineering, design and construction, due to their technical knowledge and manufacturing experience in the explosives industry.[6]
- Instead of Atlas building up an organization large enough to handle the architectural, engineering and construction work on such a large job the War Department appointed Wilbur Watson and Associates as Architect Engineer and the Hunkin-Conkey Construction Company as Construction Contractor.[7]

1941 – 1942

- The first issue of the "R.O.P." the official plant publication appeared on July 10, 1941.[8]
- August 18, 1941 the first 75mm complete round was produced on Load Line 1. The rest of the other lines were physically completed and accepted by March 23, 1942 on which date the Atlas Powder Company's operating contract was put into effect.[9]
- October, 1941, the installation was divided into two separate units. One was designated the Portage Ordnance Plant with the primary mission of depot storage activities. The other unit was the Ravenna Ordnance Plant, with the primary mission of ammunition loading activities.

---

[1] Atlas Powder Company. (1944). *History of the Ravenna Ordnance Plant.* Volume 1, page 1.
[2] Ibid.
[3] Ibid.
[4] Ibid.
[5] Ibid, page 7.
[6] Ibid, page 54.
[7] Ibid.
[8] Ibid, pp. 62-3.
[9] Ibid, pp. 319,326, 333, 335, 351-5.
[8] Ibid, page 465.
[10] Ibid, pp. 80, 90.

- Load Line 2 opened November 27, 1941. Load Line 3 opened on December 10, 1941.
- The Ammonium Nitrate Line began production November 25, 1941.

1942

- The Detonator Line began operations February 9, 1942.
- Fuze Line I began production February 24, 1942.
- Artillery Primer Line production started February 25, 1942.
- Booster Line I was started March 17, 1942.
- Fuze Line II started April 17, 1942.
- Booster Line II started April 6, 1942.
- May 5, 1942 a baseball game between the R.O.P. baseball team and the Kent State University baseball team officially opened the recreation program. The Commanding Officer and the General Manager took part in the ceremonies, which included a band concert and parade.[10]
- There were a total of 13,472 employees by July, 1942.
- Percussion Element Line began production September 26, 1942.[11]
- Grounds Maintenance was given the job of building recreational facilities in the old Administration Area. These consisted of two baseball fields, two softball fields, five tennis courts, four badminton courts and twelve horse shoe courts. The recreation facilities were completed in the fall of 1942.[12]
-

1943

- Load Line 4 began production March 1, 1943.
- There were a total of 23,301 employees by July 1, 1943.[13]
- August, 1943, the installation was redesignated the Ravenna Ordnance Center.
- December 23, 1943 the last bomb was shipped from Load Line 3 and loading operations were discontinued. The personnel were transferred to Load Lines 1 and 2.[14]
- "R.O.P." the plant publication was ordered discontinued with the July 1943 issue by an Ordnance Department Order.[15]

1945

- November, 1945, it was redesignated as the Ravenna Arsenal.

1946 – 1949

[10] Ibid, page 483.

[11] Ibid, pp. 266-7.

[14] Atlas Powder Company. (1943). *History of the Ravenna ordnance center*, Volume 2. Page 76.
[15] Ibid, page 113.

- With the end of World War II production in 1945, the operation of Ravenna was turned over to the Ordnance Corps. From 1946 to 1949, the ammonium nitrate line was operated by the Silas Mason Company for the production of ammonium nitrate fertilizer.

1951 – 1982

- April 1, 1951 through September 30, 1982, the facility was operated under CPFF contract by Ravenna Arsenal, Inc., a subsidiary of the Firestone Tire and Rubber Company of Akron, OH. In July, 1954, the Plum Brook Ordnance Works on Sandusky, Ohio and the Keystone Ordnance Works of Meadville, Pennsylvania were satellites to Ravenna. The Plum Brook Plant ceased to under the jurisdiction of Ravenna in March, 1958. In July, 1959, the Keystone Ordnance Works was transferred to the General Services Administration.
- Physics International Company, a subsidiary of Olin Corporation, purchased Ravenna Arsenal, Inc. from the Firestone Company on October 28, 1982. Ravenna Arsenal, Inc., operated Ravenna AAP for the government until September 30, 1993.
- Production ended on August 30, 1957. Rehabilitation work started in October, 1960 to provide facilities in the ammonium nitrate line for the processing and melting down of bombs. Operations began on January 10, 1961, establishing the first operation of its type in the ammunition industry.
- July 31, 1961, the plant was deactivated.
- November 2, 1961, the installation was divided once again. The industrial portion was redesignated the Ravenna Ordnance Plant and the remainder became the Ravenna Depot Activity.
- August 1, 1963, the installation was redesignated the Ravenna Army Ammunition Plant.
- April 23, 1968, the plant was activated.
- June 7, 1971, the Ravenna Army Ammunition Plant received notice that scheduled production would end on or about September 1, 1971.

SECTION 11:

SELECTED EXAMPLES OF CURRENT ARMY AND NG EXPLOSIVE SAFETY AND AMMUNITION STORAGE REGULATIONS

SB 742-1

SUPPLY BULLETIN

INSPECTION OF SUPPLIES AND EQUIPMENT

AMMUNITION SURVEILLANCE PROCEDURES

Approved for public release; distribution is unlimited

HEADQUARTERS, DEPARTMENT OF THE ARMY

1 September 2008

Supersedes copy dated 15 July 2005.

Last SB 742-1 AIN update: AIN 047-13

Issued on: 27 Feb 2013

SUPPLY BULLETIN

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 1 September 2008

No. 742-1

Inspection of Supplies and Equipment
AMMUNITION SURVEILLANCE PROCEDURES

The Office of the Deputy Chief of Staff for Logistics, Headquarters, Department of the Army, is the proponent of this bulletin. Errors and omissions or other proposed changes will be reported on DA Form 2028 (Recommended Changes to Publications and Blank Forms) to Commander, U.S. Army Materiel Command, ATTN: AMCOPS-SCL, 9301 Chapek Road, Ft. Belvoir, VA 22060-5527. Information copy of each DA Form 2028 will be furnished to:

a. U.S. Army Joint Munitions Command, AMSJM-QAS, 1 Rock Island Arsenal, Rock Island, IL 61299-6000 (Conventional Munitions).

b. Commander, Aviation and Missile Command, ATTN: AMSAM-RD-SE-RA-QS Redstone Arsenal, AL 35898-5000 (Guided Missiles and Large Rockets).

c. U.S. Army Chemical Materials Command, ATTN: AMSCM-OPS, 5183 Blackhawk Road, Aberdeen Proving Ground, MD 21010-5424.

CHAPTERS

	Paragraph	Page
Chapter 1. INTRODUCTION		
Purpose	1-1	1-1
Scope	1-2	1-1
Policy	1-3	1-1
Quality Assurance Specialist (Ammunition Surveillance) (QASAS)	1-4	1-2
Technical Assistance	1-5	1-2
Chapter 2. SURVEILLANCE OF AMMUNITION BY INSPECTION		
General	2-1	2-1
Inspection Procedures for Non-Army Owned Conventional Ammunition	2-2	2-1
Selection, Inspection, and Disposition of Samples	2-3	2-2
Types of Inspection	2-4	2-4
Periodic Inspection Intervals	2-5	2-7
Ammunition Inspection Categories and Sampling Plans	2-6	2-7
Surveillance Defect Standards	2-7	2-9
Use of Gages and Precision-Measuring Instruments	2-8	2-10
Condition Codes	2-9	2-11
Chapter 3. SURVEILLANCE SUPPORT TO AMMUNITION FUNCTION TESTING		
General	3-1	3-1
Ammunition Stockpile Reliability Program (ASRP) Specific Requirements	3-2	3-1

Distribution Statement A: Approved for public release; distribution is unlimited.

*Supersedes copy dated 15 July 2005

Chapter 4. AMMUNITION QUALITY ASSURANCE PROCEDURES FOR MAINTENANCE OPERATIONS
General 4-1 4-1
Responsibilities 4-2 4-1
MIL STD 1916 ..... 4-3 4-1
Product Verification Sampling Plan 4-4 4-2
Ammunition Lot Number and Suffix Assignment 4-5 4-2
Ballistic Test of Ammunition 4-6 4-3
Reassessment of Bulk Propellant and Performance Verification of Bulk-Packed Components 4-7 4-4
Deterioration Check Test (Explosive Components) 4-8 4-4
Basic Surveillance Audit Procedures 4-9 4-4
Procedure A: Audit Checklist and Sample Plan Preparation Procedure 4-10 4-5
Procedure B: Operation Compliance and Product Acceptance 4-11 4-6
Procedure C: Procedures to Review Ammunition Maintenance Work Orders (MWOs) 4-12 4-6

Chapter 5. EQUIPMENT
General 5-1 5-1
Field Service Ammunition Gages 5-2 5-1
Equipment 5-3 5-1
Calibration Monitoring Program 5-4 5-2

Chapter 6. LARGE ROCKET AND GUIDED MISSILE AMMUNITION
Ammunition Surveillance Procedures 6-1 6-1
Storage Monitoring Inspection (SMI) 6-2 6-1
AMCOM Surveillance Test Vans 6-3 6-1

Chapter 7. TOXIC CHEMICAL MATERIEL
General 7-1 7-1
Definitions 7-2 7-1
Documenting Results of Inspections, Maintenance, Ammunition Anomalies and Ammunition Transactions 7-3 7-1
Chemical Agent and Munitions Demilitarization Operations 7-4 7-2
Types of Inspections 7-5 7-2
Detection, Isolation, and Containerization of Leaking Munitions and/or Containers 7-6 7-3
Overpacks for TCM and Agents 7-7 7-6
Reporting of Leaking Munitions 7-8 7-11
Storage Monitoring Inspection Procedures for Specific Items 7-9 7-13

Chapter 8. BASIC LOAD INSPECTION (BLI) AND TECHNICAL SUPPORT ASSISTANCE
General 8-1 8-1
Inspection Requirements 8-2 8-1
Technical Assistance Visit 8-3 8-1
Reporting 8-4 8-1
Establishment of Local Directives 8-5 8-1

Chapter 9. CLASS V MATERIEL SUPPLIED TO NON-SMCA CUSTOMERS
General 9-1 9-1
Procedures 9-2 9-1

Chapter 10. AMMUNITION SURVEILLANCE PROGRAM FOR SAFETY AND LOGISTICS FUNCTIONS
General 10-1 10-1
Storage Buildings and Areas 10-2 10-1
Ammunition and Explosive Materiel in Outside Storage 10-3 10-2
Handling, Storage, and Shipping Operations 10-4 10-3
Transport Vehicles and Vessels 10-5 10-3
Demilitarization 10-6 10-3
Protective Clothing 10-7 10-5
Handling of Treated Packing Materiel 10-8 10-5
Documentation 10-9 10-5
Ammunition Information Notices (AIN) and Missile Information Notices (MIN) 10-10 10-5
Major Training Area Operations 10-11 10-5
Prepositioned Ships 10-12 10-6
Water Port Operations 10-13 10-8
Quantity Distance (QD) Determinations 10-14 10-8
War Reserves Stocks for Allies (WRSA) Programs 10-15 10-8

Chapter 11. RECORDS AND REPORTS
Technical history 11-1 11-1
Records 11-2 11-1
Reports 11-3 11-3
Distribution of DSR's and ADC's to Army activities 11-4 11-3
Distribution of DSR's and ADC's to Other than Army Activities 11-5 11-4

Reporting of Off Shore Procured Ammunition 11-6 11-4

Chapter 12. SECURITY ASSISTANCE PROGRAM
General, Foreign Military Sales, Grant Aid, and Presidential Drawdown 12-1 12-1
Clearance Procedures 12-2 12-1
Inspection Criteria 12-3 12-2
Materiel Acceptability Criteria 12-4 12-2
Special Instructions 12-5 12-3
Shipment Procedures for SMCA Managed Materiel 12-6 12-5

Chapter 13. PROPELLANT AND PROPELLING CHARGES
Purpose 13-1 13-1
Scope 13-2 13-1
Definitions 13-3 13-1
Safety 13-4 13-2
Personnel 13-5 13-2
Surveillance 13-6 13-2
Visual Inspection and Air Test 13-7 13-2
Ammunition Stockpile Reliability Program (ASRP) Testing 13-8 13-2
Propellant Stability Program (PSP) 13-9 13-2
Propellant Reassessment Program (PRP) 13-10 13-6
Selection, Preparation and Shipment of Propellant Samples for Stockpile Propellant Program 13-11 13-7
Selection, Preparation and Shipment of Propellant Samples for Propellant Reassessment Program 13-12 13-7
Reclaimed/Derived Propellant 13-13 13-8
Lost Lot Identity 13-14 13-8
Minimum Lot Size 13-15 13-8
Reporting Requirements of Stabilized Propellant 13-16 13-8
Propellant on Prepositioned (PREPO, AFLOAT) Ships 13-17 13-9
Safety Surveillance of Navy Gun Propellant 13-18 13-9
Storage and Demilitarization of Non-Standard Propellants 13-19 13-9

Chapter 14. (AMMUNITION) LOGISTICS ASSISTANCE PROGRAM (LAP)
Purpose 14-1 14-1
Personnel 14-2 14-1
Responsibilities 14-3 14-1
Relationship to Command Surveillance Organizations 14-4 14-1
Procedures 14-5 14-1
Senior Command Representatives (SCR) 14-6 14-2
Reporting 14-7 14-2

Appendix A. REFERENCES
Department of Defense Publications ..... A-1 ..... A-1
Military Standards ..... A-2 ..... A-1
Military Handbooks ..... A-3 ..... A-1
Army Regulations ..... A-4 ..... A-1
Department of Army Pamphlets ..... A-5 ..... A-1
Technical Bulletins ..... A-6 ..... A-1
Technical Manuals ..... A-7 ..... A-2
Field Manuals ..... A-8 ..... A-3
Supply Bulletins ..... A-9 ..... A-3
Army Materiel Command Regulations ..... A-10 ..... A-3
Drawings ..... A-11 ..... A-3
Project Manager for Chemical Demilitarization ..... A-12 ..... A-3
Other References ..... A-13 ..... A-3

Appendix B. MUNITIONS HISTORY PROGRAM
General ..... B-1 ..... B-1
Application ..... B-2 ..... B-1
Web Address ..... B-3 ..... B-1
MHP Access ..... B-4 ..... B-1
User Access Levels ..... B-5 ..... B-1
MHP Modules ..... B-6 ..... B-1
New Inspections ..... B-7 ..... B-2
View Inspections ..... B-8 ..... B-2
Final Review ..... B-9 ..... B-2
Suspensions/Restrictions ..... B-10 ..... B-2
Legacy Data ..... B-11 ..... B-2
Access Levels ..... B-12 ..... B-2

Maintenance ..... B-13 ..... B-3
Help Desk ..... B-14 ..... B-3
MHP Access Problems ..... B-15 ..... B-3

Appendix C. AMMUNITION CONDITION CODES C-1

Appendix D. INSTRUCTIONS FOR SPECIFIC ITEMS
Section I. List of Specific Items D-1
Section II. Instructions for Specific Items D-1
Ammunition Identification Codes (AIC) or Other Outdated Markings ..... D-1 ..... D-1
Ammunition Manufactured for Special Purposes ..... D-2 ..... D-1
Ammunition, 40mm ..... D-3 ..... D-2
Black Banding ..... D-4 ..... D-2
Blasting Caps, Electric ..... D-5 ..... D-2
Bombs, Inspection for Heli-Coil Inserts ..... D-6 ..... D-2
Bursters, Tetrytol ..... D-7 ..... D-2
Cartridge Actuated Devices (CAD) and Propellant Actuated Devices (PAD) ..... D-8 ..... D-2
Cartridge, 90mm, HEAT, M371A1 (1315-C282) ..... D-9 ..... D-3
Cartridges, 152mm ..... D-10 ..... D-4
Charges, Supplementary ..... D-11 ..... D-4
Components, Explosive ..... D-12 ..... D-4
Conventional Ammunition in Demil Account ..... D-13 ..... D-4
Dynamite ..... D-14 ..... D-4
HERA Projectile Defect Classification ..... D-15 ..... D-5
Items Belonging to Other Services ..... D-16 ..... D-5
Items, That Have Not Been Hazard Classified ..... D-17 ..... D-5
Marker, Location, Marine, MK25 (1370-L554) ..... D-18 ..... D-5
Mine, AP, M18-series ..... D-19 ..... D-5
Mine, AT, HE, M15 ..... D-20 ..... D-6
Mine, AT Heavy M19 Non-Metallic ..... D-21 ..... D-6
Permanent Suspension of Material in SMCA Managed Accounts ..... D-22 ..... D-6
Projectile Receipt Inspection ..... D-23 ..... D-6
Projectile, 155mm, Illuminating, M485 Series (1320-D505) and
Projectile, 155mm, Infrared Illuminating, XM1066 (1320 DA49) ..... D-24 ..... D-7
Projectile, 155mm, M825 Series Defect Classification ..... D-25 ..... D-7
Projectile, 8 inch, M404 ..... D-26 ..... D-7
Rocket, 66mm, Incendiary, M74, TPA (1340-H110) ..... D-27 ..... D-8
NSNs for Electrostatic Packing Material ..... D-28 ..... D-8
Identification of Ammunition Stored in Southwest Asia (SWA)
During Desert Storm/Desert Shield ..... D-29 ..... D-8
Cartridge 105mm HE M1 (1315-C445); Projectile 155mm HE
M795 (1320- D529); Projectile 155mm HE M107 (1320- D544) ..... D-30 ..... D-9
Simulator, Pyrotechnic, Main Tank Gun M30 (1370-LA06), Simulator,
Pyrotechnic, Direct/Indirect Fire Cue (DIFCUE) M31A1 (1370-LA07) ..... D-31 ..... D-9
Smoke Pot, Floating, HC, M4A2 (1365-K867) ..... D-32 ..... D-9

Appendix E. SMALL ARMS CARTRIDGES THROUGH CALIBER .50
Item Description ..... E-1 ..... E-1
Unique Safety Precautions ..... E-2 ..... E-1
Testing and Equipment Requirements ..... E-3 ..... E-1
Inspection Category and Sampling Plan ..... E-4 ..... E-2
Specific Inspection Points ..... E-5 ..... E-2
Additional Guidance for SAA ..... E-6 ..... E-4

Appendix F. CARTRIDGE, 60mm MORTAR
Item Description ..... F-1 .....F-1
Unique Safety Precautions ..... F-2 .....F-1
Testing and Equipment Requirements ..... F-3 .....F-1
Inspection Category and Sampling Plan ..... F-4 .....F-1
Specific Inspection Points ..... F-5 .....F-1
Inspection Description and Notes ..... F-6 .....F-1

Appendix G. CARTRIDGE, 81mm MORTAR
Item Description ..... G-1 ..... G-1
Unique Safety Precautions ..... G-2 ..... G-1
Testing and Equipment Requirements ..... G-3 ..... G-1
Inspection Category and Sampling Plan ..... G-4 ..... G-1
Specific Inspection Points ..... G-5 ..... G-2
Inspection Description and Notes ..... G-6 ..... G-4

Appendix H. CARTRIDGE, 105mm HOWITZER
Item Description ..... H-1 ..... H-1
Unique Safety Precautions ..... H-2 ..... H-1
Testing and Equipment Requirements ..... H-3 ..... H-1
Inspection Category and Sampling Plan ..... H-4 ..... H-1
Specific Inspection Points ..... H-5 ..... H-2
Inspection Description and Notes ..... H-6 ..... H-2
References ..... H-7 ..... H-3

Appendix I. CARTRIDGE, 105mm APFSDS-T, M735 AND CANISTER, M1040, TP-T, M467A1 AND HEPT, M393A3
Item Description ..... I-1 ..... I-1
Unique Safety Precautions ..... I-2 ..... I-1
Testing and Equipment Requirements ..... I-3 ..... I-2
Inspection Category and Sampling Plan ..... I-4 ..... I-2
Specific Inspection Points ..... I-5 ..... I-2
Inspection Description and Notes ..... I-6 ..... I-2
References ..... I-7 ..... I-2

Appendix J. CARTRIDGE, 105mm APFSDS-T, M774, M833 AND M900
Item Description ..... J-1 ..... J-1
Unique Safety Precautions ..... J-2 ..... J-1
Testing and Equipment Requirements ..... J-3 ..... J-1
Inspection Category and Sampling Plan ..... J-4 ..... J-1
Specific Inspection Points ..... J-5 ..... J-1
Inspection Description and Notes ..... J-6 ..... J-2
Swipe (Smear) Test ..... J-7 ..... J-3
References ..... J-8 ..... J-3

Appendix K. CARTRIDGE, 4.2 inch MORTAR
Item Description ..... K-1 ..... K-1
Unique Safety Precautions ..... K-2 ..... K-1
Testing and Equipment Requirements ..... K-3 ..... K-1
Inspection Category and Sampling Plan ..... K-4 ..... K-1
Specific Inspection Points ..... K-5 ..... K-1
Inspection Description and Notes ..... K-6 ..... K-1

Appendix L. CARTRIDGES, 120mm M829, M829A1, M829A2, M829A3, M830, M830A1, M831A1, M865, M908, M1002 AND M1028
Item Description ..... L-1 ..... L-1
Unique Safety Precautions ..... L-2 ..... L-1
Gaging and Test Requirements ..... L-3 ..... L-2
Inspection Category and Sampling Plan ..... L-4 ..... L-3
Specific Inspection Points ..... L-5 ..... L-3
Inspection Description and Notes ..... L-6 ..... L-5
Swipe (Smear) Test ..... L-7 ..... L-7
References ..... L-8 ..... L-7

Appendix M. LAUNCHER AND CARTRIDGE, 84mm, HE, M136 (AT4)
Item Description ..... M-1 ..... M-1
Unique Safety Precautions ..... M-2 ..... M-1
Testing and Equipment Requirements ..... M-3 ..... M-1
Inspection Category and Sampling Plan ..... M-4 ..... M-1
Specific Inspection Points ..... M-5 ..... M-1
Inspection Description and Notes ..... M-6 ..... M-1
References ..... M-7 ..... M-1
Shelf-Life ..... M-8 ..... M-1

Appendix N. PROJECTILE, 155mm, ICM FAMILY
Item Description ..... N-1 ..... N-1
Unique Safety Precautions ..... N-2 ..... N-1
Testing and Equipment Requirements ..... N-3 ..... N-1
Inspection Category and Sampling Plan ..... N-4 ..... N-1
Specific Inspection Points ..... N-5 ..... N-1
Inspection Description and Notes ..... N-6 ..... N-1

Appendix O. PROJECTILE, 155mm, HEAT, M712 and M823
Item Description ..... O-1 ..... O-1
Unique Safety Precautions ..... O-2 ..... O-1
Testing and Equipment Requirements ..... O-3 ..... O-1
Inspection Category and Sampling Plan ..... O-4 ..... O-1

Specific Inspection Points ..... O-5 ..... O-1
Inspection Description and Notes ..... O-6 ..... O-1

Appendix P. SMOKE GRENADES
Item Description ..... P-1 .....P-1
Unique Safety Precautions ..... P-2 .....P-2
Testing and Equipment Requirements ..... P-3 .....P-2
Inspection Category and Sampling Plan ..... P-4 .....P-2
Inspection Description and Notes ..... P-5 .....P-2
References ..... P-6 .....P-2

Appendix Q. RIOT CONTROL GRENADES
Item Description ..... Q-1 ..... Q-1
Unique Safety Precautions ..... Q-2 ..... Q-1
Testing and Equipment Requirements ..... Q-3 ..... Q-2
Inspection Category and Sampling Plan ..... Q-4 ..... Q-2
References ..... Q-5 ..... Q-2

Appendix R. FRAGMENTATION GRENADES
Item Description ..... R-1 ..... R-1
Unique Safety Precautions ..... R-2 ..... R-1
Testing and Equipment Requirements ..... R-3 ..... R-1
Inspection Category and Sampling Plan ..... R-4 ..... R-1
Inspection Description and Notes ..... R-5 ..... R-1
References ..... R-6 ..... R-2

Appendix S. HAND GRENADE FUZES
Item Description ..... S-1 .....S-1
Unique Safety Precautions ..... S-2 .....S-1
Testing and Equipment Requirements ..... S-3 .....S-2
Inspection Category and Sampling Plan ..... S-4 .....S-2

Appendix T. ROCKET, 3.5 inch
Item Description ..... T-1 .....T-1
Unique Safety Precautions ..... T-2 .....T-1
Testing and Equipment Requirements ..... T-3 .....T-1
Inspection Category and Sampling Plan ..... T-4 .....T-1
Specific Inspection Points ..... T-5 .....T-1
Inspection Description and Notes ..... T-6 .....T-1
Reassessment of Rocket Motor Igniter M20A1 ..... T-7 .....T-2

Appendix U. ROCKET, 2.75 inch
Item Description ..... U-1 ..... U-1
Unique Safety Precautions ..... U-2 ..... U-1
Testing and Equipment Requirements ..... U-3 ..... U-1
Inspection Category and Sampling Plan ..... U-4 ..... U-1
Specific Inspection Points ..... U-5 ..... U-1
Inspection Description ..... U-6 ..... U-3
Repair Procedures for Missing/Damaged End Shield (MK66 MODs) ..... U-7 ..... U-4
Repair Procedures ..... U-8 ..... U-4
Lots with Suffix “AXA” or “XA” ..... U-9 ..... U-4
References ..... U-10 ..... U-4

Appendix V. CHARGE, DEMOLITION, LINEAR M58-SERIES AND CHARGE, DEMOLITION, PRACTICE, M68 SERIES
Item Description ..... V-1 ..... V-1
Unique Safety Precautions ..... V-2 ..... V-1
Testing and Equipment Requirements ..... V-3 ..... V-1
Inspection Category and Sampling Plan ..... V-4 ..... V-1
Specific Inspection Points ..... V-5 ..... V-1
Inspection Description and Notes ..... V-6 ..... V-3
Preissue Inspection of M58 Charges and M68 Practice Charges ..... V-7 ..... V-7
References ..... V-8 ..... V-7

Appendix W. CANINE EXPLOSIVE SCENT KIT
Item Description ..... W-1 .....W-1
Unique Safety Precautions ..... W-2 .....W-1
Testing and Equipment Requirements ..... W-3 .....W-1
Inspection Category and Sampling Plan ..... W-4 .....W-2
Specific Inspection Points ..... W-5 .....W-2
Inspection Description and Notes ..... W-6 .....W-2
References ..... W-7 .....W-3

Appendix X. FUZES, ARTILLERY
Item Description ..... X-1 .....X-1
Unique Safety Precautions ..... X-2 .....X-1
Testing and Equipment Requirements ..... X-3 .....X-1
Inspection Category and Sampling Plan ..... X-4 .....X-1
Specific Inspection Points ..... X-5 .....X-1
Inspection Description and Notes ..... X-6 .....X-1

Appendix Y. CARTRIDGES, 120mm MORTAR
Item Description ..... Y-1 .....Y-1
Unique Safety Precautions ..... Y-2 .....Y-1
Testing and Equipment Requirements ..... Y-3 .....Y-1
Inspection Category and Sampling Plan ..... Y-4 .....Y-1
Specific Inspection Points ..... Y-5 .....Y-1
Inspection Description and Notes ..... Y-6 .....Y-3

Appendix Z. CARTRIDGES, 25mm
Item Description ..... Z-1 .....Z-1
Unique Safety Precautions ..... Z-2 .....Z-1
Testing and Equipment Requirements ..... Z-3 .....Z-1
Inspection Category and Sampling Plan ..... Z-4 .....Z-1
Specific Inspection Points ..... Z-5 .....Z-1
Additional Guidance for 25mm Ammunition ..... Z-6 .....Z-1
Link Gaging Requirements ..... Z-7 .....Z-2
Inspection of Linked Belts ..... Z-8 .....Z-2

Appendix AA. GRENADE, LAUNCHER/DISCHARGER, 66mm
Item Description ..... AA-1 ..... AA-1
Unique Safety Precautions ..... AA-2 ..... AA-2
Inspection Category and Sampling Plan ..... AA-3 ..... AA-2
Specific Inspection Points ..... AA-4 ..... AA-2
Inspection Description ..... AA-5 ..... AA-2
References ..... AA-6 ..... AA-2

Appendix AB. DEFECT CODES AB-1

Appendix AC. STANDARD (NEW) AMMUNITION DEFECT CODES AC-1

Appendix AD. AMMUNITION CARTRIDGE, 75mm, BLANK M337 SERIES
Item Description ..... AD-1 ..... AD-1
Unique Safety Precautions ..... AD-2 ..... AD-1
Testing and Equipment Requirements ..... AD-3 ..... AD-1
Inspection Category and Sampling Plan ..... AD-4 ..... AD-1
Specific Inspection Points ..... AD-5 ..... AD-1
Inspection Description and Notes ..... AD-6 ..... AD-1

Appendix AE. ROCKET, M55, GB SPECIAL SURVEILLANCE INSTRUCTION FOR SMI PROCEDURES
Item Description ..... AE-1 ..... AE-1
Purpose, Applicability, Proponent ..... AE-2 ..... AE-1
References ..... AE-3 ..... AE-1
Definitions ..... AE-4 ..... AE-1
Safety and Environmental Guidelines ..... AE-5 ..... AE-1
Training and Certification ..... AE-6 ..... AE-1
Documentation ..... AE-7 ..... AE-2
Sample Selection ..... AE-8 ..... AE-2
Inspection Operations ..... AE-9 ..... AE-2
Sampling Operations ..... AE-10 ..... AE-3

Appendix AF. FLARE, AIRCRAFT COUNTERMEASURE M206; DECOY, INFRARED, AIRCRAFT COUNTER MEASURE, M211; FLARE, AIRCRAFT COUNTERMEASURE, M212; CARTRIDGE, IMPULSE BBU-35/B; CARTRIDGE, IMPULSE M796
Item Description ..... AF-1 .....AF-1
Unique Safety Precautions for M206 Flare ..... AF-2 .....AF-1
Inspection Category and Sampling Plan ..... AF-3 .....AF-2
Specific Inspection Points ..... AF-4 .....AF-2
Inspection Description and Notes ..... AF-5 .....AF-3

Appendix AG. NON-LETHAL GRENADES
Item Description ..... AG-1 ..... AG-1
Unique Safety Precautions ..... AG-2 ..... AG-1
Testing and Equipment Requirements ..... AG-3 ..... AG-2
Inspection Category and Sampling Plan ..... AG-4 ..... AG-2

Inspection Description and Notes ..... AG-5 ..... AG-2
References ..... AG-6 ..... AG-2

Appendix AH. PROJECTILE, 155mm, ER, PG, UNITARY, HE, XM982 (EXCALIBUR)
Item Description ..... AH-1 ..... AH-1
Unique Safety Precautions ..... AH-2 ..... AH-1
Testing and Equipment Requirements ..... AH-3 ..... AH-1
Inspection Category and Sampling Plan ..... AH-4 ..... AH-1
Specific Inspection Points ..... AH-5 ..... AH-1
Inspection Description and Notes ..... AH-6 ..... AH-1
Collection of Data from RRAPDS-Excalibur Temperature Data Recorders ..... AH-7 ..... AH-3

Appendix AJ. BRADLEY FIGHTING VEHICLE REACTIVE ARMOR TILES VEHICLE SET (BRAT)
Item Description ..... AJ-1 ..... AJ-1
References ..... AJ-2 ..... AJ-1
Components/Configuration ..... AJ-3 ..... AJ-1
Explosive Filler ..... AJ-4 ..... AJ-1
Physical Differences Between A1 and A2 Versions of Tiles ..... AJ-5 ..... AJ-1
Mounting ..... AJ-6 ..... AJ-1
Fielded Tile Serviceability ..... AJ-7 ..... AJ-3
Inspection Category and Criteria for Armor Tiles ..... AJ-8 ..... AJ-3
Inspections for Mounting Brackets and Tile Guards ..... AJ-9 ..... AJ-4

Appendix AK. MUNITION, CROWD CONTROL MODULAR, NON-LETHAL: M5 (1346-WA97)
Item Description ..... AK-1 ..... AK-1
Unique Safety Precautions ..... AK-2 ..... AK-1
Testing and Equipment Requirements ..... AK-3 ..... AK-1
Inspection Category and Sampling Plan ..... AK-4 ..... AK-1
Inspection Description and Notes ..... AK-5 ..... AK-1
References ..... AK-6 ..... AK-1

Appendix AL. CLASS V COMPONENTS OF THE SPIDER M7 DISPENSING SET, MUNITION NETWORK COMMAND
Item Description ..... AL-1 ..... AL-1
Unique Safety Precautions ..... AL-2 ..... AL-1
Testing and Equipment Requirements ..... AL-3 ..... AL-1
Inspection Category and Sampling Plan ..... AL-4 ..... AL-1
Inspection Description and Notes ..... AL-5 ..... AL-1
References ..... AL-6 ..... AL-1

Appendix AM. ANTI-PERSONNEL OBSTACLE BREACHING SYSTEM (APOBS)
Item Description ..... AM-1 ..... AM-1
Unique Safety Precautions ..... AM-2 ..... AM-1
Testing and Equipment Requirements ..... AM-3 ..... AM-1
Inspection Category and Sampling Plan ..... AM-4 ..... AM-1
Inspection Description and Notes ..... AM-5 ..... AM-1
References ..... AM-6 ..... AM-1

Appendix AN. CARTRIDGE, 40MM
Item Description ..... AN-1 ..... AN-1
Unique Safety Precautions ..... AN-2 ..... AN-5
Testing and Equipment Requirements ..... AN-3 ..... AN-6
Inspection Category and Sampling Plan ..... AN-4 ..... AN-6
Specific Inspection Points ..... AN-5 ..... AN-6
Additional Guidance for 40mm Ammunition ..... AN-6 ..... AN-6
References ..... AN-7 ..... AN 6

Appendix AO. CARTRIDGE, NON-LETHAL FIRING DEVICE, TASER, XP25
Item Description ..... AO-1 ..... AO-1
Unique Safety Precautions ..... AO-2 ..... AO-1
Inspection Category and Sampling Plan ..... AO-3 ..... AO-1
Specific Inspection Points ..... AO-4 ..... AO-1
Inspection Description ..... AO-5 ..... AO-1
References ..... AO-6 ..... AO-1

Appendix AP. CHARGES, DEMOLITION, SHAPED, 15 LB AND 40 LB
Item Description ..... AP-1 ..... AP-1
Unique Safety Precautions ..... AP-2 ..... AP-1
Testing and Equipment Requirements ..... AP-3 ..... AP-1
Inspection Category and Sampling Plan ..... AP-4 ..... AP-1
Inspection Description and Notes ..... AP-5 ..... AP-1
References ..... AP-6 ..... AP-1

Table 2-1. Periodic Inspection Intervals 2-12
Table 2-2. Periodic Inspection Category Interval 2-14
Table 2-3. Sample Sizes and Acceptance/Rejection Numbers 2-15

Table 7-1. SMI Requirements for Toxic Chemical Items 7-3
Table 7-2. Approved Overpacks for Storage of Toxic Chemical Munitions 7-9
Table 7-3. Single Round Container (SRC) Inspection Criteria (M55) 7-10
Table 7-4. Inspection Procedures for Propelling Charge Containers 7-11

Table 12-1. Sample Size and Acceptance Criteria for FMS and GRA 12-5

Table 13-1. Propellant Defect Classification and Standards 13-3
Table 13-2. Propellant Stability Category Codes 13-5
Table 13-3. Propellant Minimum Lot Size 13-8

Table E-1. Gaging Requirements E-1
Table E-2. Equipment Identification List Using Gage, Profile and Alignment E-2
Table E-3. Item Defects E-3
Table E-4. DDI DODIC/NSN E-5
Table E-5. SAA Pull Test Requirements E-5
Table E-6. CCMCK 5.56mm Ammunition by DODIC E-6
Table E-7. CCMCK 9mm Ammunition by DODIC E-6
Table E-8. Dim Tracer 5.56mm MK30 MOD 0 ..... E-7

Table F-1. Equipment Identification List F-1
Table F-2. Item Defects and Method of Inspection F-3

Table G-1. Equipment Identification List, Gage Profile and Alignment G-1
Table G-2. Item Defects and Method of Inspection G-2

Table H-1. Equipment Identification List H-2
Table H-2. Item Defects and Method of Inspection H-2

Table I-1. Item Defects and Method of Inspection for Cartridge, 105mm, APFSDS-T M735 ..... I-3
Table I-2. Item Defects and Method of Inspection for Cartridge, 105mm, CANISTER, M1040 ..... I-3
Table I-3. Item Defects and Method of Inspection for PA-117 Shipping and Storage Container I-3
Table I-4. Equipment Identification List I-4
Table I-5. Item Defects and Method of Inspection for Cartridge, 105mm, TP-T, M467A1 and HEP-T, M393A3 ..... I-4

Table J-1. Equipment Identification List J-2
Table J-2. Item Defects and Method of Inspection J-2

Table K-1. Equipment Identification List K-2
Table K-2. Item Defects and Method of Inspection K-2

Table L-1. Equipment Identification List L-2
Table L-2. PA116 and PA171 Shipping and Storage Containers L-3
Table L-3. Cartridges, 120mm APFSDS-T M829, M829A1, M829A2 and M829A3 ..... L-4
Table L-4. Cartridges, 120mm TPCSDS-T M865, TPMP-T M1002 and Canister M1028 ..... L-4
Table L-5. Cartridges, 120mm HEAT-MP-T M830 and M830A1, TP-T M831A1 and M908 ..... L-4
Table L-6. Combustible Cartridge Cases and Case Base & Seal Assembly, 120mm Tank Ammo L-5

Table M-1. Item Defects and Method of Inspection M-2

Table N-1. Projectile Stock Numbers N-3
Table N-2. Equipment Identification List N-3
Table N-3. Item Defects and Method of Inspection N-3

Table O-1. Metal Container Exterior O-2
Table O-2. Projectile and Container Interior O-2

Table P-1. Item Defects and Method of Inspection P-3

Table Q-1. Item Defects and Method of Inspection Q-2

Table R-1. Equipment Identification List R-1
Table R-2. Item Defects and Method of Inspection R-3

Table S-1. Item Defects and Method of Inspection S-2

Table T-1. Equipment Identification and Test Requirements T-2
Table T-2. Item Defects and Method of Inspection T-2
Table T-3. Nonfunctional Inspection Criteria for M20A1 Rocket Motor Igniter T-2

Table U-1. Test Requirements U-1

Table U-2. Equipment Identification List U-1
Table U-3. Complete Round U-1
Table U-4. Warhead U-2
Table U-5. Fuze U-2
Table U-6. Motor U-3

Table V-1. Packaging Defects, M58 and M68 Series V-1
Table V-2. Packaging Defects, Fuze M1134 and M1147 Series V-1
Table V-3. Item Defects, Linear Charge M58 and M68 Series V-2
Table V-4. Item Defects, Fuze M1134 and M1147 Series V-2

Table W-1. Item Defects and Method of Inspection W-4

Table X-1. Fuze Setting Torque Test Requirements X-2
Table X-2. Item Defects and Method of Inspection X-2

Table Y-1. Item Defects and Method of Inspection Y-2

Table Z-1. Ammunition Serviceability Criteria Z-3
Table Z-2. Link Gaging Requirements Z-3

Table AA-1. Defect and method of inspection AA-3

Table AD-1. Equipment Identification List AD-1
Table AD-2. Item Defects and Method of Inspection AD-1

Table AE-1. M55 GM Rocket Storage Monitoring Inspection Sampling Plans AE-2

Table AF-1. Packing Defects AF-2
Table AF-2. M206/M211/M212 Flare Defects AF-2
Table AF-3. BBU-35/B & M796 Impulse Cartridge Defects AF-3

Table AG-1. Item Defects and Method of Inspection AG-3

Table AH-1. Metal Container Exterior AH-2
Table AH-2. Projectile and Container Interior AH-2

Table AJ-1. Armor Tile Vehicle Sets AJ-1
Table AJ-2. Components of Armor Tile Vehicle Sets AJ-2
Table AJ-3. A1 and A2 Tile Specifications AJ-2
Table AJ-4. New Mounting Bolts AJ-2
Table AJ-5. Item Defects and Method of Inspection AJ-3

Table AK-1. Item Defects and Method of Inspection AK-2

Table AL-1. Item Defects and Method of Inspection AL-3

Table AM-1. Item Defects and Method of Inspection AM-2

Table AN-1. Item Defects and Method of Inspection AN-7

Table AO-1. Item Defects and Method of Inspection AO-2

Table AP-1. Item Description AP-2
Table AP-2. Item Defects and Method of Inspection for M2 Series Shape Charge AP-2
Table AP-3. Item Defects and Method of Inspection for M3 Series Shape Charge AP-3

Figure 4-1. Corrective Action Request (CAR) Status Log 4-7
Figure 4-2. Sample CARs 4-8
Figure 4-3. CAR 4-9
Figure 4-4. Sample Quality Audit Check Sheet 4-10

Figure 7-1. Leaker Label 7-6

Figure 11-1. Ammunition Lot Cluster Log 11-5
Figure 11-2. Lot Cluster Master Log 11-6

Figure S-1. Safety Lever Hinge S-3

Figure V-1. Hose Clamp Torque Specification V-4
Figure V-2. Length L Is Defined V-4
Figure V-3. Correct and Incorrect Inspection Configurations V-4
Figure V-4. Right and Wrong Positions of the Ball End of the Arming Wire V-5
Figure V-5. Positive and Negative Ranges of Distance “D” Values V-5
Figure V-6. Right and Wrong Depth Gauge Measurement Methods V-5
Figure V-7. Defect Classification of the L and D Combination V-6

Figure AE-1. Stainless Steel Union Placed at the End of the Unheated Sample Line..... AE-4
Abbreviations..... Glossary-1

CHAPTER 1.
INTRODUCTION

1-1. Purpose.

The procedures in this supply bulletin (SB) implement the Department of the Army (DA) ammunition surveillance policy established by AR 702-6. Additionally, SB 742-1 describes the functions that constitute the DA Ammunition Surveillance Program as defined in AR 740-1, chapter 3. The SB also prescribes the policies and procedures to assure quality requirements are met for Class V materiel supplied to foreign governments under the Army Security Assistance Program.

1-2. Scope.

This bulletin encompasses conventional, chemical, rockets, guided missile ammunition, and research and development stocks in storage. The procedures contained herein apply to supply Class V materiel in the wholesale, retail, combat support, and user stockpiles worldwide. Use of this publication is mandatory for each DA activity that has a receipt, storage, issue, maintenance, disposal, surveillance, or test mission for ammunition. This includes, but is not limited to, ammunition depots, ammunition supply points, basic load storage areas, ammunition plants, research development test and evaluation laboratories, and proving grounds.

1-3. Policy.

a. Single Manager of Conventional Ammunition (SMCA) DODD 5160.65.

(1) The inspection of the other services' (Navy, Marine Corps, or Air Force) stocks will be conducted according to the specific inspection requirements of the owning or configuration managing service.

(2) See paragraph 1-5 for SMCA technical assistance, paragraph 2-2 for inspection procedures for non-army owned ammunition and Appendix D, paragraph D-16, for further guidance on items belonging to other services.

b. QASAS functions. Functions identified by this SB must be accomplished by Department of the Army Civilian (DAC) Quality Assurance Specialists (Ammunition Surveillance) QASAS, GS-1910 series (career program 20). Under the direction of a QASAS, military ammunition inspectors SSG/SFC (MOS 89B) and properly trained and designated civilian technicians (including local nationals outside the continental United States (OCONUS) locations) may supplement and assist the QASAS in the accomplishment of ammunition surveillance functions.

c. QASAS in charge. Throughout this bulletin, the term "QASAS in charge" is defined as the senior or chief QASAS of the local surveillance organization. For application in organizations without an assigned QASAS, the term relates to the "QASAS in charge" of the supporting ammunition surveillance organization.

d. Technical publications. Supply bulletins (SB), technical manuals (TM), drawings, specifications, and instructions issued by appropriate materiel developers will be used to supplement this bulletin. When needed documents and publications are not available, they will be requisitioned promptly.

e. Tests and inspections. The only tests and inspections authorized for ammunition surveillance operations are those covered by applicable SBs, approved Depot Maintenance Work Requirements (DMWRs), or specific written authorization from the appropriate major command (MACOM) or major subordinate command (MSC).

(1) Test, measurement, and diagnostic equipment (TMDE); tools and gages; and ammunition peculiar equipment (APE) used in these operations will be limited to those specifically authorized for the item under test or examination.

(2) Modification or function of ammunition items will not be attempted unless specifically authorized by the abovementioned publications or documents or by the appropriate major commodity command.

(3) Disassembly and reassembly of ammunition items may be authorized as part of the visual inspection provided that:

(a) There is reasonable cause to justify disassembly of samples.

(b) Disassembly and reassembly is conducted according to approved procedures.

(c) Approved facilities and equipment are available and used.

(d) Disassembly and reassembly will be conducted by a QASAS or under the direction of a QASAS.

(e) Approval of the QASAS in charge must be obtained prior to the start of such an operation.

f. Word usage. The words "will" and "must" are used in this bulletin to indicate mandatory requirements. The word "should" indicates a normally required method of accomplishment, which can be deviated from only upon the documented authorization of the QASAS in charge. A written record of the justification or rationale for the deviation must be maintained. The term "may" indicates an acceptable or suggested means of accomplishment.

g. Ammunition explosives safety.

(1) The ammunition and explosive safety standards of DOD Manual 6055.09-M, AR 385-63, AR 385-10, DA PAM 385-64, and AMC-R 385-100, as applicable, must be followed.

(2) All personnel engaged in operations involving explosive, radioactive, or other hazardous material will be thoroughly knowledgeable of the applicable standing operating procedures (SOP) and formally trained in safety.

(3) Prompt action will be taken to control any hazard. If a dangerous item or situation is encountered, all operations in the immediate area will be shut down (see paragraph 10-1). Personnel will be evacuated to a safe site. The incident will be reported immediately through the proper chain of command. Explosive Ordnance Disposal (EOD) or other authorized personnel will be called for help in

eliminating the hazard. Operations will not be resumed until the hazard has been eliminated.

(4) All serious or repetitive situations adversely affecting the explosive safety of the installation/organization will be made a matter of record to installation's/organization's commanding officer.

h. Ammunition surveillance workload priorities.

(1) Explosive safety inspections or functions; e.g., inspections for toxic leakers, safety in storage inspections on potentially unsafe munitions, monitoring of demilitarization operations, magazine inspections and actions in support of the Propellant Stability Program.

(2) Periodic inspections of required stocks.

(3) Shipping and receiving operations to include pre-issue inspections and receipt inspections.

(4) Test sample preparation and function or trace testing.

(5) Maintenance operations, area operations inspection.

(6) Basic load/technical assistance visits.

(7) Special inspections.

(8) Storage monitoring inspections.

(9) Safety in storage inspections of munitions not covered above.

1-4. Quality Assurance Specialist (Ammunition Surveillance) (QASAS).

The qualifications, physical requirements, training, and development requirements for QASAS and management of the QASAS civilian career program are defined in AR 690-950 and AR 702-12.

1-5. Technical Assistance.

a. Request for technical assistance concerning implementation of this bulletin or supplements will be directed to the appropriate command (listed below) having management responsibility for the commodity involved.

(1) US Army Aviation and Missile Research & Development Engineering Center
ATTN: AMSAM-RD-SE-RA-QS
5400 Fowler Rd
Redstone Arsenal, AL 35898-5000.
DSN: 645-7988; COMM: 256-955-7988

(2) US Army Joint Munitions Command
ATTN: AMSJM-QAS
1 Rock Island,
Rock Island, IL 61299-6000.
DSN: 793-6982

(3) US Army Chemical Materials Agency,
ATTN: AMSCM-OPS, 5183 Blackhawk Road,
Aberdeen Proving Ground, MD 21010-5423.
DSN: 584-8752 COMM: 410-436-8752

b. Queries concerning the surveillance of items under SMCA will be directed to JMC surveillance office. This includes items in industrial and field service accounts, regardless of the owning service.

c. Request for information on non-commodity problems will be addressed to Commander, U.S. Army Materiel Command, ATTN: AMCOPS-SCL, 9301 Chapek Road, Ft. Belvoir, VA 22060-5527.

d. References below are given for ease of use with this manual. Throughout the manual, when you are directed to reply to or through an organization, you will use the address or website listed here.

(1) Joint Munitions Command Surveillance Office: Headquarters US Army Joint Munitions Command
1 Rock Island Arsenal
ATTN: AMSJM-QAS
Rock Island, IL 61299-6000
FAX: DSN 793-7136 COMM: 309-782-7136
e-mail: amc.rock.org.jmc-amsjm-qas@mail.mil

(2) US Army Aviation and Missile Command Munitions Team:
US Army Aviation and Missile Command
ATTN: AMSAM-MMC-MM-M
Redstone Arsenal, AL 35898-5000
e-mail: AMSAM-MMC-LS@redstone.army.mil
DSN: 746-3106/3108/9819

(3) US Army:
US Army Pacific USARPAC,
ATTN: APLG-MUS,
Fort Shafter, HI 96858-5100
DSN 315-438-8118 COMM: 808-438-8118
FAX 315-438-7119
e-mail: aplgmu@safter.army.mil

(4) Navy Ships Parts Control Center:
US Navy
Navy Ships Part Control Center (INSPCC),
Box 2020 ATTN: 853a,
Mechanicsburg, PA 17055-0788
DSN: 430-2000

(5) Drawings can be obtained thru the following addressees:

(a) Army: (except chemical and GM/LR):
Headquarters, US Army
Joint Munitions Command
ATTN: AMSJM-QAS
Rock Island, IL 61299-6000

(b) Army guided missiles and large rockets:
US Army Aviation and Missile Command
ATTN: AMSAM-CIC-E-A
Building 4722
Redstone Arsenal, AL 35898-5000
DSN: 788-8911

(c) Army toxic chemical munitions:
US Army Chemical Materials Agency
ATTN: AMSCM-OP-SM
5183 Blackhawk Road
Aberdeen Proving Ground, MD 21010-5424
DSN: 584-2972
COMM: 410-436-2972
FAX: DSN 584-5415 COMM 410-436-5415

(d) Air Force:
US Air Force Hill Air Force Base
ATTN: 00-ALC-TIED
Hill Air Force Base, UT 84056-5609
DSN 777-0889

(e) Navy, Marine Corps:
US Navy
NAVSURFWARCEN Crane Division Code 4021,
Bldg 2084
300 Highway 361
Crane, IN 47522
DSN: 482-5588

(f) Defense Ammunition Center
McAlester, Oklahoma
https://www3.dac.army.mil/

(6) Test , Measurement, Diagnostic Equipment Office Headquarters:
US Army
Joint Munitions Command
1 Rock Island Arsenal
ATTN: AMSJM-CTM
Rock Island, IL 61299-6000
DSN: 793-8583/1446
COMM: 309-782-8583/1446
e-mail: JMC-OFC-CTM@osc.army.mil

(7) Chemical Command:
U.S. Army Chemical Material Agency
ATTN: AMSCM-OPS,
5183 Black Hawk Road,
Aberdeen proving Ground, MD 21010-5424
DSN: 584-6382/7604/3361
COMM: 410-436-6382/7604/3361
FAX DSN 584-5415 COMM: 410-436-5415
e-mail:cmasmt@apgea.army.mil

(8) Army National Guard:
Army National Guard Reserve Component,
ATTN: NGB-ARL-E,
111 South George Mason Drive,
Arlington, VA 22204-1382

(9) Army Sustainment Command:
US Army Sustainment Command (ASC),
ATTN: AMSAS-FSL,
1 Rock Island Arsenal
Rock Island, IL 61299-6500
(DSN 793-6670/7796)
COMM: (309) 782-6670/7796
FAX DSN 793-1750
COMM: (309) 782-1750

(10) Naval Ordnance Center:
OIC Naval ORD Center
Pacific Division
Fallbrook Det CODE 5133
700 Ammunition Road
Fallbrook, CA 92028-3187
DSN 873-3601 COMM: 760-731-3601

(11) JMC Marine Corps Liaison:
Marine Corps Liaison
ATTN: MCLNO-LMA
Rock Island, IL 61299-6500
DSN 793-5549/4808.
COMM: (309)782-5549/4808

(12) Air Force Afloat Preposition Force Program
APF Superintendent
OOALC/WMR
Hill AFB, UT 84056
DSN 777-9411

(13) Air Force:
OO-ALC/LIWGE,
6034 Dogwood Avenue,
Hill Air Force Base, UT 84056,
e-mail: harrisb@gateway.hill.af.mil, or fax
DSN: 777-2186

(14) Navy:
US Naval Surface Weapons Support Center
Crane Division Code 402,
300 Hwy 361
Crane IN 47522-5900
e-mail: burns_chuck@crane.navy.mil or fax
DSN 482-1883.

(15) Gun Systems Branch at the National Center for Energetics,
Indian Head Division,
Indian Head, MD 20640

(16) Propellant sample shipments:

(a) Army:
US Army Armament Research,
Development and Engineering Center
Ammunition Receiving Office Bldg 806
ATTN: APSL Bldg. 938
Picatinny Arsenal, NJ 07806-5000

(b) Navy:
Naval Surface Warfare Center
Indian Head Division
Explosive Scales Bldg 1103
ATTN: E17 X6521
5021 Safe Haven Way
Indian Head, MD 20640-5032.

(17) PRP propellant samples shipped to:

(a) Radford Army Ammunition Plant
ATTN: SJMRF-OP-Q
Radford, VA 24141-0099

(b) US Army Armament Research,
Development and Engineering Center
Ammunition Receiving Office Bldg 806
ATTN: APSL Bldg. 938
Picatinny Arsenal, NJ 07806-5000

(18) JMC Safety Office:

(a) Headquarters
Joint Munitions Command
ATTN: AMSJM-SF, Safety/Rad Waste
Rock Island, IL 61299-6000
e-mail: usarmy.ria.jmc.mail.army-amc-org-jmc-amsjm-sf@mail.mil
DSN: 793-2113. COMM: (309) 782-2113

(b) Headquarters,
Joint Munitions Command,
ATTN: AMSJM-SF/Radiation Safety Officer (RSO)
e-mail: usarmy.ria.jmc.mail.army-amc-org-jmc-amsjm-sf@mail.mil
Rock Island IL. 61299-6000
DSN: 793-0338, COMM: (309) 782-0338
After normal duty hours contact:
JMC Operations Center.
DSN: 793-0223 or 7270 or 6321
COMM: (309) 782-0223/7270/6321

(19) TACOM-ARDEC
Picatinny Arsenal, NJ 07806-5000

(a) ATTN: AMSTA-AR-QAT-A

(b) ATTN: AMSTA-AR-QAC-T

(20) Mailing Address:

HQ, Joint Munitions Command
ATTN: AMSJM- (Insert last two or three letter of applicable office symbol below)
1 Rock Island Arsenal
Rock Island, IL 61299-5500

(a) CDL

(b) CDS

(c) QAP

(d) CDA

(e) LID

(f) SA

(g) LIT

(h) QAE

(i) LIM

(j) CDP

(k) QAS

(21) Recommended web sites:

(a) Propellant Information:
http://www.jmc.army.mil/DCG/Quality/Propellant.aspx

(b) Publications:
http://armypubs.army.mil/

(c) Quality Deficiency Reports:
https://www.pdrep.csd.disa.mil/

(d) Joint Hazard Classification System:
https://www3.dac.army.mil/es/usatces/default.asp?page=8

(e) CAD Disposition Worksheet:
https://jmcsp.osc.army.mil/sites/MLRC/QA/QAS/QAsurveillance/Policies%20%20Procedures/Forms/AllItems.aspx

(f) Special Packaging Instructions:
https://jmcsp.osc.army.mil/sites/MLRC/QA/QAS/QAsurveillance/Special%20Packaging%20Instructions/Forms/AllItems.aspx

(g) Conventional Ammunition Inspection Interval and Priority Listings:
https://jmcsp.osc.army.mil/sites/MLRC/QA/QAS/QAsurveillance/Policies%20%20Procedures/Forms/AllItems.aspx

(h) Ammunition Data Cards (NAVY):
https://apps.cran.nmci.navy.mil/corp/MainPage.cfm

(i) AMCOM Electronic ordering of drawing hard copies:
http://www.edms.redstone.army.mil/homepage.asp

(j) Ammunition Data Cards (ARMY). Use the Munitions History Program (MHP):
https://mhp.redstone.army.mil/DefaultMain.aspx

(k) Intentionally left blank.

(l) Intentionally left blank.

(m) Outloading/Unitization Drawings:
https://www3.dac.army.mil/det/

(n) Functional/Overhead Fire Clearance Request:
https://www6.osc.army.mil/fcr/

(22) Commanding Officer,
Naval Surface Warfare Center,
Indian Head Division,
ATTN: CODE 5240A,
Building 221,
Indian Head, MD 20640-5035.
301-744-2325

(23) TACOM-ARDEC
Bldg 62
ATTN: RDAR-EIL-TP
Rock Island, IL 61299-6000
e-mail: usarmy.ria.ardec.mil.ardec-ppfsb@mail.mil

CHAPTER 2.
SURVEILLANCE OF AMMUNITION BY INSPECTION

2-1. General.

a. The ammunition surveillance inspection program is structured to ensure that materiel in the stockpile meets established explosives safety and serviceability criteria and is properly classified. Trained and certified personnel using statistical sampling techniques and procedures accomplish inspections. The program identifies items for timely maintenance, disposal, priority of issue, and restricted use. The classification of defects and standards in this publication provides the QASAS with necessary guidance to accomplish program goals and assigned missions.

(1) Required vs. non-required stocks. The ammunition stockpile is separated into two parts: required stocks (JMC Priority 1 and 2) and non-required stocks (JMC Priority 3) pursuant to the provisions of DOD Directive 5160.65-M. Required stocks satisfy both power projection and training requirements. Retail stocks are required stocks. Non-required stocks include long supply held stocks for economic and contingency purposes, assets held above requirements and potential reutilization/disposal assets.

(a) JMC will update as required, the SMCA priority listing identifying whether an item is required or non-required. Use of the priority listing when scheduling inspections is mandatory for all JMC locations storing conventional munitions. SMCA ammunition not listed on the current priority listing should be considered non-required stocks (JMC Priority 3). Questions as to the proper priority of new stocks will be directed to JMC Surveillance (paragraph 1-5.d.(1). Use of this listing by MACOMs other than AMC is at their discretion. See paragraph 1-5.d.(21)(g) for web page address for SMCA (JMC) priority listing.

(b) Type of inspection and inspection intervals for required and non-required stocks will be IAW paragraph 2-4d and 2-4e. Specific owning service requirements will take precedence to the priority requirements.

(2) The SMCA index of items assigned to the Single Manager for Conventional Ammunition (SMCA) is available on the web. It lists conventional ammunition assigned to SMCA and indicates using services and is pursuant to the provisions of DOD Directive 5160.65-M. This listing is available on the Web as referenced in paragraph 1-5.d.(21)(b).

b. Use the general inspection policy of this chapter supplemented by the guidance for specific items in Appendices D through AE and Ammunition Information Notices. This supplemental guidance is based on known potential problem areas and may include exceptions and additional requirements for each specific item. Therefore, in the event of apparent conflict between general requirements and requirements for specific items, the specific requirements will have precedence.

2-2. Inspection Procedures for Non-Army Owned Conventional Ammunition.

a. Navy owned (SMCA managed) stocks will be inspected IAW NAVSUP P-805 and this SB. In the event that Navy procedures do not meet SB 742-1, safety-in-storage criteria, both procedures SB 742-1 and NAVSUP P-805 will be used. Receipted ammunition will have a normal Receipt Inspection (RI) performed IAW this SB. All outer packs opened for RI that were received with a traceable seal will be resealed using a traceable seal IAW NAVSUP P-805. All other procedures related to the samples will be accomplished as directed by this SB. All assets will then be scheduled for next inspection using safety-in-storage scheduling procedures IAW paragraph 2-4e and NAVSUP P-805, Chapter 1, paragraph 1-2.7. Defect classification and assignment of condition code will be IAW NAVSUP P-805. Navy unique stocks will be inspected and scheduled for inspection IAW NAVSUP P-805.

b. Marine owned (SMCA managed) stocks will be inspected IAW NAVSUP P-805 and this SB. Receipted ammunition will have a normal Receipt Inspection (RI) performed IAW this SB. All outer packs opened for RI that were received with a traceable seal will be resealed using a traceable seal IAW NAVSUP P-805. All receipted assets will then be scheduled as normal for Periodic Inspection (PI) as directed by this SB. Defect classification and assignment of condition code will be IAW NAVSUP P-805. Marine Corp unique stocks will be inspected and scheduled for inspection IAW NAVSUP P-805.

c. Following are clarifications/exceptions to specific requirements of NAVSUP P-805:

(1) A Depot Surveillance Record (DSR), will be maintained for each lot of ammunition. SMCA installations will use the DSR as the "receipt inspection record form".

(2) Where the NAVSUP calls for a certification stamp; SMCA installations may use an authorized signature.

(3) Tags/labels and or bar codes are not required on serviceable stocks of Navy or Marine Corps ammunition in storage at SMCA installations. When ammunition is shipped to a Navy installation, bar codes encoded with National Item Identification Number (NIIN), owner and condition code will be affixed to the shipment. Material condition tags (DD Forms 1574 through 1577) will also be applied before shipment.

(4) SMCA installations should certify and seal empty containers being issued to Navy or Marine Corps activities. When empty containers cannot be sealed, SMCA installations may follow current army policy on identifying empty containers.

(5) Navy owned conventional ammunition not condition code A quality due to packaging deficiencies, but serviceable for intended purpose, will be assigned condition code J and reported by an Ammunition Condition Report (ACR), DA Form 2415, to reference 1-5.d.(4).

(6) Conventional ammunition suitable for Navy training use only will be assigned condition code B or condition code C as directed by a Navy Notice of Ammunition Reclassification (NAR).

d. Air Force owned (SMCA managed) stocks will be inspected IAW TO11A-1-10, this SB and applicable specific item technical order; if a conflict in guidance exists, the specific item TO will take precedence. Receipted ammunition will have a normal Receipt Inspection (RI) performed IAW this SB. All receipted assets will then be scheduled as normal for Periodic Inspection (PI) as directed by this SB. Defect classification and assignment of condition code will be IAW TO 11A-1-10. Air Force unique stocks will be inspected and scheduled for inspection IAW TO 11A-1-10 and the specific item TO.

e. Following are clarifications/exceptions to specific requirements of TO 11A-1-10 (Air Force stocks):

(1) A DSR will be maintained for each lot of ammunition. SMCA installations will use the DSR in lieu of AFTO Form 15.

(2) AFTO Form 15's received from Air Force units in support of munitions shipments contain valid inspection results. JMC surveillance organizations will utilize these inspections when determining date of next inspection. If AFTO Form 15 indicates that item being received has a current inspection then any receipt inspection performed will be limited to a damage in transit inspection.

(3) Hermetically sealed containers will NOT be opened for inspection purposes unless item TO specifically directs containers to be opened or the outer appearance of container indicates signs of damage or corrosion that may have penetrated the container. Items in previously opened hermetically sealed containers will be 100% inspected. Defects found on these items will not be considered for determining lot serviceability, nor will they be considered for sample selection for PI. Review TO 11A-1-10, paragraph 2.4, and 3.5 for detailed instructions.

(4) If specific item technical order requires testing of stocks with equipment not available contact servicing Air Force liaison or JMC Surveillance Office for guidance.

(5) Air Force owned munitions in an unserviceable, economically repairable condition code (CC/E, F, G), will be inspected at their normal periodic cycle for defects that may cause progressive deterioration IAW TO 11A-1-10.

(6) Certain AF owned items are exempt from normal periodic inspection IAW TO 11A-1-10; see paragraph 3.5 for detailed instructions. The requirements of this SB, paragraphs 2-4d and e will apply.

f. All service owned/service managed stocks will be inspected IAW with the owning services' criteria and scheduled for inspection IAW the owning services inspection criteria.

g. Lot clustering is applicable to all conventional stocks with the exception of navy owned stocks (see paragraph 2-6c(1)) and shall be used.

h. Ammunition containing depleted uranium will be scheduled for inspection IAW owing services criteria or this SB whichever is more restrictive.

2-3. Selection, Inspection, and Disposition of Samples.

a. Sample selection.

(1) Sample will be selected and tagged in storage for inspection by a QASAS and must be representative of the entire lot or lot cluster under evaluation. The evaluation will include overall condition of the lot/lot cluster in storage and will be recorded on the inspection report. Judgment must be exercised by the QASAS to ensure maximum representation without unnecessary re-warehousing.

(2) Samples of items that cannot be feasibly returned to the original package configuration (e.g., hermetically sealed containers, small arms ammunition packed in metal (terneplate) lined M1917 boxes, and heat-sealed barrier bags) will be used on a recurring basis if sampled lot is not part of a cluster. If the recurring samples indicate progression of deterioration type defects, lot acceptability will be determined by inspection of an additional sample from original sealed containers. If the sampled items are part of a lot cluster, such samples will not be used on a recurring basis until all lots in the cluster have been inspected and the inspection cycle is repeated. The criteria in paragraph 2-7 will apply.

(3) Selection and preparation of stockpile laboratory test program samples will be accomplished according to instructions contained in this bulletin, the applicable SB for the particular item, and instructions from the appropriate headquarters.

(4) Selection and preparation of function or trace test samples for shipment to a test facility will be accomplished according to instructions contained in this bulletin, the applicable SB for the particular item, and instructions from the appropriate headquarters.

(5) Selection and preparation of propellant samples for shipment to a test facility will be accomplished IAW paragraph 13-11.

b. Sample Inspection.

(1) All inspections and tests will be conducted by or under the supervision of a QASAS.

(2) The use of applicable Appendices D through AM, drawings, Ammunition Information Notices (AIN), specifications, SOPs, and Ammunition Data Cards (ADC) during all prescribed inspections is required and will be supplemented by related technical publications. Deviation from standards delineated in these references must be made a matter of record in reports to other agencies and the DSR.

(a) Ensure that the item being inspected is compared with a drawing or specification with the same revision under which it was manufactured or modified.

(b) In the event of a conflict between defect classifications in surveillance SBs and the specification, information in the SB will take precedence when classifying defects for ammunition.

(c) The specific item information contained in the appendices, supplement the criteria contained in the body of this bulletin. The use of the appendices is mandatory for the conduct of the

surveillance inspections for applicable items. Each appendix is tailored to a specific item or family of items. They are intended to enhance readiness of the U.S. Army by providing a standardized basis for the conduct of surveillance inspections worldwide; place emphasis of surveillance inspections on those components which are most susceptible to deterioration or change during long-term storage; and identify potential problem areas as early as possible during the life cycle, so that corrective action can be planned and accomplished in a timely manner.

(d) The appendices are written, staffed, and approved for ammunition that has been accepted into the field service account. The primary emphasis is the detection of defects that would adversely affect the safe storage, transportation, or reliable use of the item. Therefore, in some instances, acceptance and rejection criteria, defect classification, and permissible measured tolerances contained in the appendix will conflict with criteria contained on drawings and in specifications. Where this occurs, the criteria contained in the appendix will take precedence (verification inspection conducted at time of renovation excluded).

(3) Requests for ammunition drawings will be made to the applicable command as referenced in paragraph 1-5.d.(5).

(4) Ammunition Data Cards for conventional ammunition should first be checked for availability through the Munitions History Program (MHP). If unavailable, request from the consignor or JMC surveillance office (reference paragraph 1-5.d.(1). Ammunition Data Cards for guided missiles and large rockets should be requested from the consignor or AMCOM Munitions Team Office (reference paragraph 1-5.d.(2).

(5) The examination of samples will normally be conducted at the ammunition surveillance workshop building; however, examinations may be performed at the storage site or elsewhere when in conformance with an approved SOP. Refer to DA PAM 385-64 for permissible operations inside and outside of storage structures.

(6) Lots will normally be inspected for deterioration, damage, unsafe conditions, and gross manufacturing defects. Use of gages and precision-measuring instruments during the conduct of sampling inspections will be according to paragraph 2-8.

(7) Inspection results for each lot or serial number (SN) inspected must be considered in conjunction with the results of previous inspections for that lot/lot cluster or SN. Trends in the serviceability of the lot/lot cluster must be analyzed to determine if action is required in addition to the condition coding of the lot/lot cluster inspected. Analysis could indicate that the inspection interval for the lot/lot cluster needs to be expanded or reduced (see paragraph 2-5).

(8) The appropriate sampling plan of Chapters 2, or 12, or applicable appendix will be used in sampling inspections.

c. Sample disposition.

(1) Hermetically sealed containers will be resealed with reinforced tape. The tape will be minimum of 1½ inch in width and will be applied using three wraps with a 1 inch pull-tab. Lot inspection samples will be used on a recurring basis for subsequent inspections. Exterior package of samples will be marked or tagged as surveillance samples that are not to be shipped unless the total lot quantity is being shipped.

(2) Inspection samples of small arms ammunition packed in metal-lined (terneplate) M1917 boxes will be used on a recurring basis. Terneplate lids will be resealed using tape. Boxes will be identified as surveillance samples not to be shipped.

(3) Barrier bags opened for inspection should have the air evacuated and be resealed with a sealing iron. Detailed instructions for sealing barrier material are contained in MIL-STD-2073-18 and MIL-B-117. New bags must be prepared if the original bag cannot be resealed and equivalent barrier material is available. Samples that have been properly resealed should not be used on a recurring basis.

(4) Samples in jungle pack and those in barrier material, which cannot be properly resealed for any reason, must be resealed using pressure-sensitive adhesive tape. Inspection samples will be used on a recurring basis. Outer packs will be identified as surveillance samples not to be shipped. When the entire lot is scheduled for shipment, samples in barrier material must be resealed, if possible, according to paragraph 2-3c(3) above.

(5) Due to extreme hygroscopic nature of styrofoam, following procedures will be implemented when unpacking or repacking M2A1 containers with styrofoam supports:

(a) M2A1 containers with styrofoam inserts will remain open for an absolute minimum.

(b) When possible, desiccant packed in M2A1 container will be replaced with fresh desiccant prior to repack. As an alternate method of minimizing moisture absorption, place removed desiccant and styrofoam inserts in an approved desiccant container. Removed desiccant and supports will not be returned to M2A1 container until immediately prior to material repack and container closing.

(c) If neither procedure in paragraph 2-3c(5)(a) and (b) above is possible, then repack the desiccant and all inner packing in the M2A1 can immediately after removal of material. The M2A1 can will be closed until time of repack.

(d) Packs selected for item inspection will be the minimum number prescribed by this supply bulletin. All packs which are opened for inspection will be marked or tagged "Surveillance Samples: Not to be shipped until entire lot quantity is exhausted." and used on a recurring basis for future individual lot inspections only.

(6) Serviceable samples will be returned to storage with the parent lot.

(7) Ammunition with critical defects, considered hazardous to store, will be segregated with like items and destroyed as soon as possible according to approved procedures. When applicable,

ammunition with critical defects will be rendered safe to permit safe handling.

(8) Emergency disposal of lethal and incapacitating chemical munitions will comply with applicable public laws. Disposal of lethal or incapacitating chemical munitions by detonation is prohibited unless specifically authorized by higher headquarters.

(9) Munitions are sometimes assigned condition code H or placed in the RRDA or disposal account. Such munitions must be identified at time of classification for more extensive inspection or priority for demilitarization (see paragraph 2-4e).

(10) When a lot is rejected the defective samples will be tagged or otherwise marked for identification and returned to the parent lot.

(11) Only serviceable samples will be returned to serviceable parent lots. Defective samples in insufficient quantities to cause rejection of a serviceable lot will be either repaired or stored separately.

(12) Sample inspection will apply to the entire lot or lot cluster and the accept or reject criteria in Table 2-3 will be used for lot classification. For inspections involving lot clusters, disposition of inspection results will be in accordance with paragraph 2-6c(15).

(13) Rejected lots/lot clusters or samples must be reported according to the requirements of DA PAM 750-8. In addition, lots and lot clusters containing critical defectives will be locally suspended, assigned CC-J, and reported to the appropriate commodity command by the most expeditious means (by message or e-mail for OCONUS or by telephone during duty hours within the continental United States CONUS). Item nomenclature, National Stock Number (NSN), lot or serial number, defect(s) encountered, number of defectives, and number of samples examined must be included in the report. One copy of the ammunition data card(s) and the depot surveillance record card(s) will also be forwarded to the appropriate commodity command. If possible and appropriate, photographs will be included.

2-4. Types of Inspection. The principal types of inspections to be performed on ammunition materiel are defined below.

a. **Initial Receipt Inspection (IRI)**. Initial receipt inspection will be performed within 30 days after receipt or prior to shipment (whichever comes first) on materiel received directly from the manufacturer, vendor, or Government activity and has been inspected and accepted by the Government at the point of origin. This inspection is expected to identify gross manufacturer errors and is not intended as manufacturer's acceptance type inspection. An IRI includes Damage in Transit (DIT) inspection (see paragraph 2.4l) expanded to include inspection for gross manufacturer errors, certain type manufacturing defects, and includes inspection of item.

(1) DIT (see paragraph 2.4l) is required for materiel that has a current periodic inspection IAW this SB received from a JMC plant with an assigned QASAS.

(2) Lot Clustering procedures will be used according to instructions of paragraph 2-6c. All lots received will be individually inspected for damage in transit (see paragraph 2.4l). One lot of each cluster will receive an IRI.

(3) For materiel that cannot be lot clustered, inspection will be on a sampling basis by individual lot and will receive an IRI.

b. **Receipt Inspection (RI).**

(1) Condition Code K will be assigned to all ammunition lots received without a valid inspection. AR 725-50 limits the assignment of Condition Code K to a period not to exceed 45 days.

(2) When materiel is received from an activity with an assigned QASAS (see paragraph 1-3b) and the DSR stipulates that required inspections/tests were performed on the lot within the specified time interval, inspection will be for damage in transit only (see paragraph 2.4l). If additional inspection is indicated, the scope will be determined by the QASAS in charge. Lot Clustering provisions of paragraph 2-6c will be used whenever possible. If munitions are received without a current DSR, request it from the shipping activity. If a DSR is not available follow procedures listed in paragraph 2-4b(3).

(3) Materiel received without a current DSR will be inspected as follows:

(a) Containers will be inspected 100 percent for presence of seals. Contents of unsealed containers will be inspected 100 percent. Gaging will be performed as required by paragraph 2-8.

(b) Sealed containers and their contents will be inspected on a sampling basis by lot for damage in transit, deterioration, and nonstandard conditions.

(c) The extent of inspection will be altered by the QASAS in charge when the documentation received or the condition or configuration of the materiel indicates that an increase or decrease in the scope of inspection is required or justified.

(4) Used packaging material (i.e., boxes, fiber containers, filler material, eyebolt lifting plugs, closing plugs, etc.) will be inspected as follows:

(a) Receipts from storage installations, posts, camps, and stations with qualified ammunition surveillance personnel (assigned QASAS, military ammunition inspectors, MOS 89B, and properly trained and designated civilian technicians) and with documentation that certifies the materiel has been subjected to 100 percent inspection for serviceability and explosive contamination should be accepted in the condition assigned by the inspecting installation. Material certified free of explosive contamination by the shipping installation is suitable for storage in inert areas.

(b) Assignment of condition code K and 100 percent receipt inspection is not required for on-post accumulation of materiel generated from maintenance, demilitarization, load, assembly, and pack (LAP) operations which is stored in segregated areas set aside for the exclusive storage of class V materiel. The materiel shall be given a 100-percent

inspection prior to shipment, use, disposal, or storage in an inert area.

(c) Materiel placed in inert storage areas or offered to Defense Reutilization Management Office (DRMO) must have had a 100 percent inspection, verified on a sampling basis by a QASAS, and be certified as explosive free according to DODI 4140.62 and DOD 4160.28-M-V3. Certifications and inspection records must be maintained for materiel held in inert storage areas. Storage area and materiel must be controlled to ensure inspected and certified stocks are separated from materiel not properly inspected and certified as being free of explosive contamination.

(d) Serviceability will be determined using appropriate criteria given in paragraph 2-7. Degree of explosive contamination, if any, will be determined in conjunction with foregoing inspections. Wooden packing materials treated with pentachlorophenol (referred to as PCP or PENTA) must be properly identified. Containers that have contained depleted uranium cartridges will be tested according to AR 385-10 to ensure that they are free of radioactive contamination.

(e) The extent of inspection will be altered by the QASAS in charge as required.

(f) Materiel received with proper certification or documentation described in paragraph 2-4b(2) above can be shipped to other depots or plants without additional inspection prior to shipment. Copies of the certification and/or documentation will be provided to the consignee.

c. **Acceptance Inspection (AI)**. Acceptance inspection is performed on materiel received from contractor or plant requiring inspection and acceptance at destination, materiel inspected at origin and requiring acceptance at destination, and components from demilitarization to be reused or restored to stockpile. Instructions for AI will be furnished by the applicable commodity command, when required. Depots receiving materiel from procurement for stock will process DD Form 250 (Materiel Inspection and Receiving Report) according to Defense FAR Supplement (DFARS), Appendix F.

d. **Periodic Inspection (PI) (cyclic)**. All serviceable required (condition codes A, B, C, D and N) will be inspected periodically for deterioration and nonstandard conditions for classification of true level of serviceability. Periodic inspection interval requirements in accordance with paragraph 2-5. Lot clustering procedures per paragraph 2-6c will be used.

(1) Where a previous inspection has established a static condition; e.g., a rocket continuity test failure that has established a requirement for 100-percent replacement or inspection of igniters), such tests should not be performed during subsequent inspections. Disassembly for inspection of manufacturing type defects (measuring, weighing, etc.) will not be performed unless required by a specific procedure or directed by the appropriate commodity command (see paragraph 1-3e(3)).

(2) For SMCA managed required stocks in condition codes A, B, C, D and N, PIs will be performed at the time intervals specified in the Conventional Ammunition Inspection Interval Listing as provided on the JMC Surveillance Office website (see paragraph 1-5d(21)g); Table 2-1 will be utilized for NSNs/DODICs not in the listing; these NSNs/DODICs will be reported to the JMC Surveillance Office for a listing update. PIs (not including propellant) will be performed on unserviceable/suspended SMCA managed required stocks at twice the listed inspection interval. Interval for US Army Aviation and Missile Command (AMCOM) managed items will be as directed by the item SB. PIs will not be performed on stocks in the Resource Recovery and Disposition Accounts (RRDA) and on unserviceable, non-repairable ammunition.

(3) If stocks are stored under adverse conditions, the materiel must be examined more frequently as determined necessary by the QASAS in charge.

(4) All stocks of propellant items, including all owners and condition codes, stored at JMC locations will receive a PI at intervals specified in the Conventional Ammunition Inspection Interval Listing as provided on the JMC Surveillance Office website (paragraph 1-5d(21)g).

e. **Safety in Storage Inspection (SIS)**.

(1) SIS assures stocks are safe for continued storage and handling. Inspections will be performed on:

(a) Non-required stocks.

(b) Navy owned/ SMCA managed.

(c) Unserviceable, non-repairable ammunition

(d) All stocks in the Resource Recovery and Disposition Accounts (RRDA), whether serviceable or unserviceable.

(2) Handling includes those preparatory actions necessary to demilitarize or transport the item. The QASAS will determine whether the conditions noted are immediately hazardous or could result in a hazardous situation for handling, storage, or transportation. SIS inspections are not required for inert ammunition. When performing SIS inspections, ammunition materiel will only be inspected for defects that could affect further safe storage and handling, such as exposed explosives, corrosion that could lead to exposed explosives, or missing safety devices.

NOTE

In some cases, the time and effort required to perform a periodic inspection is the same or is marginally more than required for an SIS inspection. The decision to perform a PI in lieu of an SIS is at the discretion of the QASAS in charge. If a PI is performed, record inspection as a PI on the DSR and schedule a SIS for the next inspection.

(3) Lots determined to pose an immediate threat to life, health, or government property will be reported for emergency destruct.

(4) Lots or lot clusters determined to be potentially hazardous will be inspected as frequently as necessary to assure continued safe storage of the lot.

Necessary actions will be taken to identified and ensure demilitarization of this materiel before it becomes hazardous. Intervals in the Conventional Ammunition Inspection Interval Listing as provided on the JMC Surveillance Office website (paragraph 1-5d(21)g) will be utilized. QASAS in Charge may reduce interval as required. Classify this materiel to Condition Code (CC) H and assign defect code C018EZ.

(5) Lots or lot clusters determined to be non-hazardous in terms of normal storage and handling will receive an SIS at twice the designated PI interval.

(a) Lots in SIS status will remain in the appropriate condition code. Defect code C018DH (old) CAA843 (new) will be assigned when the lot exceeds one SIS assigned interval. The SIS assigned interval is twice the interval in Table 2-2 of this manual. Lots in SIS status may require a serviceability inspection IAW 2-4h prior to issue.

(b) Navy owned, SMCA managed stocks will receive SIS inspections and be maintained in their appropriate condition code, defect code C018DU (old); CAA874 (new) will be assigned to these stocks.

(6) Unless a periodic inspection is elected IAW paragraph 2-4e(2) note, condition code "J" will be assigned to lots that are not inspected by the time they reach twice the SIS assigned interval and defect code C018TM (old), CAA88B (new) applied. An item in SIS status is assigned an interval of twice the interval in Table 2-2 of this manual. Condition code "J" is not assigned until the inspection is overdue by twice the SIS assigned interval (i.e. a category Z item in Table 2-2 would have an SIS assigned interval of 4 years and CC-J would be applied after 8 years). AR 725-50 limits the assignment of condition code "J" to a period not to exceed 270 days. An inspection will be performed within 270 days of the date that condition code "J" is assigned.

(7) Sampling plans for SIS inspections will be determined by the QASAS in charge. The minimum sample size for potentially hazardous items is that indicated in Table 2-3. The minimum sample size for non-hazardous items is one-half that indicated in Table 2-3.

(a) Accept-reject criteria will not be used. The QASAS will determine whether the lot can be expected to remain non-hazardous during the SIS inspection interval. For lot clusters; defects found within the sampled lot which could affect safe storage or handling will cause a change in the status of the sampled lot IAW paragraphs 2-4e(2), (3), and (4) above and selection of additional samples IAW paragraph 2-6c(15).

(b) Testing or gaging is not required

SIS inspections will normally be performed in the surveillance workshop and must include inspection of outer pack, inner pack, and item. Palletized projectiles and small arms ammunition (except cartridges with chemical or explosive projectiles) may be inspected in the storage location. Examination of outer packs in storage is normally sufficient for small arms ammunition up to .50 caliber.

f. **Storage Monitoring Inspection (SMI).**

(1) Storage monitoring inspection is performed as required by applicable technical instructions for specific items or as determined necessary by the QASAS in charge. It is performed on items while in the storage site and includes but is not necessarily limited to:

(a) Inspection of lethal chemical agent munitions containers of bulk lethal chemical agent, or containerized lethal chemical agent munitions to detect leakers and other visual defects.

(b) Reading and recording pressure and relative humidity of items packaged in pressurized or desiccated containers.

(2) Frequency of SMI will be as required by the technical instructions for the specific item. SMI may also be conducted when determined necessary by the QASAS in charge.

g. **Special Inspections (SPI).** These inspections are performed at the direction of higher headquarters or to satisfy special or local requirements when approved by the QASAS in charge. Reason(s) for conducting SPI must be entered in the inspection remarks.

h. **Preissue Inspections (PII)**. This is an inspection other than a PI that must be performed prior to issue. Examples are ammunition requiring a special check for specific defects as determined by QASAS in charge or as directed by higher headquarters; or lots in SIS status, which require a serviceability inspection prior to issue. A lot or lot cluster overdue for PI will be given a PI prior to shipment, not a PII. The appropriate sampling plan in paragraphs 2-6, or Chapters 7, 8 and 12 will be used. Reasons for conducting PII must be entered in inspection reports. Navy owned munitions in SIS status will receive a PII prior to shipment.

i. **Verification Inspection (VI).** This inspection is performed on materiel processed during preservation and packaging (P&P) and maintenance (renovation, modification, overhaul, etc.) type operations. Verification inspection will be performed according to paragraphs 4-3 and 4-4.

j. **Basic Load Inspection (BLI)**. Basic load inspection is performed on stocks of munitions (to include training, security, and contingency stocks) maintained by a military unit or civilian security forces. This includes security forces at installations where AR 50-6 applies. Chapter 8 of this SB contains additional instructions.

k. **Surveillance Function Test Inspection (SFTI).** Function test of ammunition will be conducted IAW Chapter 3 and the item's supply bulletin or ammunition surveillance test procedure (ASTP). The visual inspection conducted in conjunction with the preparation of function test samples may satisfy the PI required for the lot(s) tested, however, additional samples may be required.

l. **Damage in Transit (DIT).** Damage in transit may be performed during IRI or RI inspections (see paragraphs 2.4a and 2.4b(2). DITs include inspection of exterior packaging and marking for deficiencies, correct unitization procedures, and nonstandard conditions on packaging based on applicable

documents.

2-5. Periodic Inspection Intervals.

a. The normal interval of inspection for required stocks is based on the expected rate of deterioration for specific item types. These deterioration rates have been developed into inspection interval categories that are assigned to items as appropriate. For items in outside storage see paragraph 10-3.

b. The normal interval of inspection for each category is given in Table 2-2. This interval is to apply unless specified otherwise in the inspection procedures for a specific item or is adjusted according to paragraphs c through e below. Serviceable lot(s) will be assigned defect code C018DH (old), or CAA843 (new) (overdue for inspection) when the elapsed time since the date of the last inspection exceeds the assigned interval by 6 months. The lot/lot cluster will remain in the previously assigned condition code until either the required inspection is performed or the lot/lot cluster reaches twice the assigned interval. Condition code J will be assigned to the lot(s) that are not inspected by the time they reach twice the assigned inspection interval and defect code CO18TM (overdue for inspection by twice the interval) applied. AR 725-50 limits the assignment of condition code "J" to a period not to exceed 270 days. An inspection will be performed within 270 days of the date that condition code "J" is assigned.

c. When the inspection results of a specific lot or lot cluster reveal progressive degradation of such degree that the lot may become unserviceable before expiration of the assigned category interval, the QASAS in Charge will schedule the next inspection at a shorter interval based on conditions detected, storage conditions, and materiel involved.

d. The normal interval of inspection may be expanded whenever local storage conditions, climatic conditions, and previous inspections justify. A prime concern in the area of climatic conditions must be the degree of relative humidity. The QASAS in charge is responsible for determining those items, specific lots and lot clusters that will be placed in an expanded inspection interval status. As a minimum, adjusting an interval of inspection for items, specific lots or lot clusters will be based on the following criteria:

(1) Each lot or lot cluster being considered for expanded interval status must have had an IRI, RI, or VI.

(2) Data from previous inspections must indicate that no appreciable degradation has occurred.

(3) Lots and lot clusters will be stratified by Department of Defense Identification Code (DODIC), and any other criteria determined applicable (such as manufacturer, age, condition, storage history) and each stratum considered as a whole for possible interval expansion. This procedure is not intended to be used on a one-time basis to extend intervals on lots or lot clusters overdue for inspection. It is intended to identify types of ammunition that can be considered for change of category based on actual inspection history.

(4) An expanded inspection interval may consist of an increase of up to one whole interval. The QASAS in charge is authorized to implement an expanded inspection interval. A brief history of the lots involved and rationale for the expanded interval implemented must be furnished to JMC, Surveillance Office for use in future inspection interval research.

e. For operational efficiency, all similar items should be programmed during the same month of a given year's PI schedule. To establish and maintain a schedule by like items, it is permissible to vary the date of next inspection (DNIN) by decreasing or increasing the interval as much as 12 months. Adjusting the schedule in this manner will have no effect on the provisions of paragraph 2-5b above.

f. Priorities for periodic inspection:

(1) Materiel with high turn over rates, needed to fill issue requirements.

(a) Lots in CC-J for past due inspection by twice the interval.

(b) Lots six months or more past due inspection (but less than twice overdue).

(2) All other required materiel at normal inspection interval.

g. Lots and lot clusters overdue for PI will not be issued. Shipments to Posts, Camps, and Stations location will have a minimum of six months remaining on their inspection cycle. Ammunition lots issued to OCONUS locations and to users/installations without a QASAS must have at least 18 months remaining on the inspection cycle. Ammunition lots transferred between two OCONUS theaters or ammunition lots retrograded back to CONUS also must have 18 months remaining on the inspection cycle (exception: ammunition being retrograded back to CONUS from a Theater Support Area supply point supporting on-going combat operations must have 9 months remaining).

2-6. Ammunition Inspection Categories and Sampling Plans.

a. Ammunition items (except toxic chemical and AMCOM-managed items) are separated into categories for assignment of PI intervals as listed in the Conventional Ammunition Inspection Interval Listing (paragraph 1-5d(21)g). Category determination is based primarily on susceptibility to and rate of deterioration. Items not listed under one of the existing categories will be reported to JMC Surveillance Office and be considered as category Z until a category is assigned. Change to a category will be disseminated by message pending formal change to this bulletin. Changes in categories are effective immediately and intervals for inspections must be adjusted at time of change. Categories for specific items covered by the Conventional Ammunition Inspection Interval Listing (paragraph 1-5d(21)g) supersede guidance given for general items in Table 2-1.

b. Table 2-3 will be used to determine the inspection sample sizes for IRI, RI, PI, and PII.

c. Lot Clustering.

(1) Ammunition lot clustering procedures are used to administratively combine ammunition lots into homogeneous groupings for conducting classification

(serviceability) inspections. This procedure is applicable to inspection of Army, Air Force and Marine Corps owned conventional ammunition stocks. This procedure also applicable to Navy owned conventional stocks for safety in storage inspection purposes. Those lots that do not meet the criteria for clustering will be evaluated using applicable guidance for individual lot inspections. Lot clusters may not contain more than 50 individual lots.

(2) Clustering will be performed within individual installations. The QASAS in charge is responsible for implementing the lot-clustering program and is the final authority on acceptability of lots for clustering. Lot clusters exist only on the installation where they have been created to perform inspections. Receiving installations will re-establish a lot cluster as required/necessary.

(3) When a cluster is being formed the date of next inspection will be based on the lot having the most recent date of last inspection (does not include inspection for damage in transit). If all lots within the new cluster are past due inspection, one lot must be inspected. This date then becomes the date of last inspection for the cluster.

(4) Lot clusters will use normal periodic inspection intervals of the Conventional Ammunition Inspection Interval Listing (paragraph 1-5d(21)g).

(5) Lots may be added (up to 50 lots) or deleted from a cluster at any time. Suspension or restrictions issued by higher commands or receipt/issue of a lot at the installation may be cause for the addition/deletion, but will not alter the date of next inspection for the lot cluster.

(6) Inspection samples will be drawn from a single lot within the cluster (except as described in paragraph 2-6c(13)) and must be representative. A different lot will be selected at subsequent intervals until all lots in a cluster have been sampled. Sample size for periodic inspection of lot clustered USAF SMCA assets will be found in Table 2-3, SB 742-1. All lot clustering procedures will be applied to USAF SMCA assets. The sampling size for periodic inspection of lot clustered USAF owned, Non-SMCA items will be determined using Table 3-1, T.O. 11A-1-10.

(7) All lots within a cluster are considered equally suitable for issue. Further inspection will not be required for shipping individual lots of a cluster, which is within inspection cycle, unless directed by higher headquarters for specific PII requirement. Receiving installation will apply the results and date of last inspection to the actual lot received from a cluster.

(8) Lots deleted from a cluster for any reason will retain the date of next inspection of the cluster. DSR will show inspection results of the sampled lot from the cluster.

(9) Lot clustering of new materiel is authorized when received directly from the manufacturer. "Skip lotting" is no longer an acceptable method of inspection for initial receipts.

(a) Normally, the first lot received from a manufacturer is inspected for the lot cluster if it meets clustering criteria (cluster can be initiated when first is received). An IRI will be performed IAW paragraph 2-4a. Any cluster must have a minimum of one lot inspected at the time of receipt or prior to issue.

(b) Only materiel received directly from the same manufacturer can be added to an existing lot cluster of new materiel.

(c) Each individual lot of new materiel received will be inspected for damage in transit.

(10) Lot clustering of materiel requiring SIS inspection:

(a) Multiple condition codes may be clustered for SIS inspections as long as clustering does not affect the safe storage and handling of the lot.

(b) Lots receiving SIS will have a PI performed prior to issue.

(11) In all cases, the DSR for each lot in the cluster will be annotated with inspection results of sampled lot. Included in the inspection remark will be the cluster lot index number and the lot number sampled.

(12) Each individual lot within a cluster must be evaluated in its storage locations for visual degradation. Any indication that a particular lot is showing a different rate of deterioration will be cause for deletion of that lot from the cluster. This evaluation may be performed in conjunction with magazine inspections or at the time samples are selected in the storage structure.

(13) Lots considered for inclusion into a lot cluster must meet the clustering criteria that follow.

(a) Same model/series of ammunition. This will typically separate clusters by the Department of Defense Ammunition Code (DODAC) (e.g., 1305-A071).

(b) Same manufacturer. This will be indicated by the manufacturer prefix for ammunition lot numbers (reference MIL-STD-1461). Depot lots (e.g., RR, SRD, RHN, etc.) that are formed from grouping ammunition lots will not be considered for lot clustering.

(c) Same lot interfix. Non-standard lots (lots with lot identifier codes, i.e. A, D, E, G, H, P, PG, R, S, SP SR, and PILOT) described in MIL-STD-1168 will not be clustered. The number of lots within a particular cluster is dependent on the number of lots within an interfix at the individual installation. There is no need to limit the number of lots beyond the scope of criteria noted here. Only propelling charges for semi-fixed ammunition assigned standard ammunition lot numbers are eligible for clustering. All other propelling charges and bulk propellants whose ammunition lot number is composed of the 5-digit number representing the propellant index or serial number will not be clustered.

(d) Similar method of pack. The intent here is to separate lots within the same DODAC that have significantly different types of packaging. Examples are mortar ammunition with and without jungle wrap.

(e) Same condition code. All lots must

have the same condition code to be included in the cluster. Not applicable to SIS lot clusters.

(f) Similar lot history. DSR must be reviewed to ascertain the similarity of lot histories for the lots being considered for clustering. Lots that have been uploaded will not be clustered. A lot cluster of new materiel must only contain materiel received from a manufacturer.

(g) It is permissible to lot cluster functional packed lots ("L" lots) provided that such lots have the same composition, e.g. the same ratio of ball to tracer and meet all other lot clustering criteria.

(h) In general suffixed lots should not be clustered because of dissimilarity of their lot histories; however, on a case-by-case basis the QASAS in Charge may permit clustering of suffixed lots having very similar histories; e.g. the same maintenance performed at the same installation separated by only a short time.

(14) Record keeping for lot clusters will be in accordance with guidance of paragraph 11-2i.

(15) Disposition of inspection results. Sample inspection will apply to the entire cluster and accept/reject criteria of Table 2-3 will be used for cluster classification. If the sampled lot fails to meet serviceability criteria additional samples will be inspected.

(a) Lot clusters with 2 to 5 lots, inclusive: dissolve cluster and inspect each individual lot in accordance with this chapter.

(b) Lot cluster with 6 to 10 lots, inclusive: inspect 2 (two) additional lots. If neither of the additional lots fails to meet serviceability criteria, remove first inspected (failed) lot from cluster and retain cluster in appropriate serviceable condition code. If either of the additional lots fails to meet serviceability criteria, reject the entire lot cluster and assign condition code accordingly.

(c) Lot clusters with 11 to 20 lots, inclusive: inspect 3 (three) additional lots. If none of the additional lots fail to meet serviceability criteria, remove first inspected (failed) lot from cluster and retain cluster in appropriate serviceable condition code. If any of the additional lots fail to meet serviceability criteria, reject the entire lot cluster and assign condition code accordingly.

(d) Lot cluster with 21 to 50 lots, inclusive: inspect 5 (five) additional lots. If none of the additional lots fail to meet serviceability criteria, remove first inspected (failed) lot from cluster and retain cluster in appropriate serviceable condition code. If any of the additional lots fail to meet serviceability criteria, reject the entire lot cluster and assign condition code accordingly.

(e) Individual failed lots that are removed from the cluster due to conditions stated in paragraphs 2-6c(13)(a) through (d) above will be treated as individual lots and be assigned the appropriate condition code based upon original inspection.

(f) Sample sizes and accept/reject criteria for all lots inspected within a cluster subsequent to the failure of the first lot to meet serviceability criteria will be in accordance with cluster lot requirements of Table 2-3.

2-7. Surveillance Defect Standards.

a. Ammunition defects are classified into the following four categories:

(1) Critical. A defect that is likely to result in hazardous or unsafe conditions for individuals using, maintaining, or depending on the item, or a defect that is likely to cause the destruction of/or serious damage to the weapon or launcher under normal training or combat conditions.

(2) Major. A defect other than critical that is likely to result in failure in tactical use or which precludes or reduces materially the usability of the item for its intended use.

(3) Minor. A defect other than critical or major that is not likely to result in failure during use or reduce the intended use of the item, but which should be corrected prior to issue.

(4) Incidental. Defects not of the critical, major, or minor types will be classified as incidental and corrected when maintenance is performed on the item. Incidental defects will not normally be reported to the commodity command unless specifically requested but will be recorded on the depot surveillance record card.

b. Defectives are items having one or more defects; e.g., an ammunition item or unit having one or more major defects is considered a major defective. An ammunition item or unit having one or more critical defects and one or more major defects and one or more minor defects will be classified as a critical defective, a major defective, and as a minor defective.

c. The following criteria are furnished as a guide to assist the QASAS in classifying metal, plastic, and rubber component deterioration or corrosion; mixed ammunition; damage; packaging; and marking defects into one of the four defect categories:

(1) Metal, plastic, and rubber component deterioration.

(a) Critical deterioration is deterioration that creates a hazardous condition for persons using or maintaining the item.

(b) Major deterioration is deterioration that significantly reduces or precludes the functioning or use of the item and requires maintenance or renovation prior to issue.

(c) Minor deterioration is deterioration that does not significantly reduce the functioning or use of the item but normally requires minor maintenance to restore the materiel to an issuable condition or to prevent the progression of deterioration to a more serious degree.

(d) Incidental deterioration is superficial deterioration that affects only the surface of the item and does not affect the intended use of the item. Items with incidental defects are acceptable for issue at the time of inspection.

(2) Corrosion.

(a) Critical corrosion is rust, or corrosion that has progressed to the point that the material is hazardous to retain.

(b) Major corrosion is rust, corrosion accompanied singly or in combination with etching, pitting, or more extensive surface damage; loose or granular condition.

(c) Minor corrosion is loose rust, corrosion accompanied by minor etching and pitting of the surface.

(d) Incidental corrosion is discoloration or staining with no direct visual evidence of pitting, etching, or other surface damage.

(3) Ammunition mixed.

(a) Critical is when the types of ammunition mixed within a lot can result in hazardous or unsafe conditions for persons using or maintaining the item, e.g., ball ammunition with grenade cartridges or blank ammunition, high explosive (HE) with practice ammunition, incorrect type or color of smoke or signal, etc.

(b) Major is when the types of ammunition mixed within a lot can result in failure during tactical use, e.g., HE instead of HEAT ammunition, incorrect fuze model, etc.

(c) Minor or incidental defects – none are defined.

(4) Damage.

(a) Critical damage is a condition where the damage can cause hazardous or unsafe conditions for persons using or maintaining the item, e.g., broken safety devices, broken fins on fin-stabilized projectiles, etc.

(b) Major is a condition where the damage can cause failure or materially reduce the intended use of an item, e.g., dented or distorted cartridge cases, damaged rotating bands, misaligned components, etc.

(c) Minor or incidental defects - none are defined. Any damage other than defined above will be noted on the DSR for information. Damage other than critical or major will not be used as acceptance or rejection criteria (except for clearance of materiel pertaining to security assistance program) unless specifically required by appropriate item military standards or procedures.

(5) Packaging.

(a) Critical is a condition where the packaging or the absence of packaging components can cause hazardous or unsafe conditions for persons using, handling, transporting, or maintaining the materiel.

(b) Major is a condition where containers are damaged, weathered, or decayed to the extent that:

1. The contents cannot be adequately protected.

2. The containers require replacement.

3. The containers are damaged to the extent that contents cannot be readily removed.

4. The container cap or closure is damaged or insecure to the extent that contents cannot be adequately protected.

5. The container contents are loose to the extent that the item cannot be adequately protected during handling and transportation.

(c) Minor is a condition where containers are weathered or deteriorated to the extent that maintenance is normally required prior to issue or use. Examples of minor packaging defects are wet, moldy, or mildewed inner containers (except metal) and improper or inadequate sealing of fiber containers.

(d) Incidental is any packaging defect other than critical, major, or minor that should be corrected if and when maintenance becomes necessary. (Examples of incidental packaging defects are: broken or missing handles or cleats, and broken, missing or ineffective hardware, banding, or packing components.) However, contents must be safe and adequately protected for storage and shipment.

(6) Used packing materiel. The standards for evaluating used packing materiel are SB 725-12 and SB 755-1 for SMCA managed items and the applicable SB 742 series ammunition surveillance procedures for AMCOM items. Packing materiel that is acceptable for use will be classified as condition code B.

(7) Marking. Marking that is missing, illegible, incorrect, or misleading will be classified defective as follows:

(a) Critical is a condition where the marking can result in hazardous or unsafe conditions for persons using or maintaining the item, e.g., incorrect delay time, incorrect color or type of smoke or signal, HE ammunition with practice marking.

(b) Major is a condition where the marking can cause misuse or failure, e.g., incorrect model or type of round or fuze, HE instead of HEAT, etc.

(c) Minor marking defects are those other than critical or major that normally should be corrected prior to issue. Examples of minor marking defects are incorrect or missing lot number or Department of Transportation (DOT) name on the item or packing.

(d) Incidental marking defects are those other than critical, major, or minor that should be corrected when maintenance becomes necessary. Examples of incidental marking defects are use of ammunition identification code (AIC) versus NSN; illegible or missing marking such as nomenclature, NSN, DODIC, cube, weight; and incorrect weight format or placement. Also see Appendix D, paragraph D-1.

2-8. Use of Gages and Precision-Measuring Instruments.

a. As a general policy, every lot of ammunition which can be gaged and is classified as logistics control code (LCC) A or B must be gaged at least once during its storage life cycle. However, ammunition lots

for which the specified gages are not immediately available will not be reclassified to a lesser condition code, nor will shipments to users be denied, pending gaging. (FORSCOM, TRADOC, ARNG activities, and OCONUS commands, see paragraph 5-2a(4).

b. Gages must be requisitioned expeditiously by ammunition surveillance organizations for LCC-A or B ammunition on-hand or due in from new production (see paragraph 5-2). Retention and deployment of gages associated with the policies stated herein should be centrally managed on a theater, command, or other basis to minimize costs and maximize usage.

c. Gaging will be accomplished whenever possible during initial receipt inspection or at the next regularly scheduled periodic inspection. Sample size will be as specified in Table 2-3. For a lot that has been gaged at least once during its storage life cycle, use of gages during subsequent inspections will only be required when specifically directed by this bulletin, JMC Surveillance Office, or when conditions (i.e., damage, deterioration, or exposure to adverse conditions) impel the QASAS to direct additional gaging. When gaging, .50 cal. rounds, must not exceed 80 lbs of pressure IAW applicable MIL-STDs.

d. Precision-measuring instruments that are not ammunition peculiar (e.g., torque wrenches, feeler gap gages, micrometers, etc.) will be used to inspect for critical and major defects whenever specifically required by this bulletin, the complete round drawing, military specification, or by direction from higher headquarters, under the same terms given above for gages.

e. Results of gaging will be entered on the DSR. DSR's received from installations with active surveillance organizations that state that gaging has been performed will be honored by the receiving installation.

f. Procedures and actions listed below will apply in the event that ammunition items fail to meet gaging requirements listed in the appendix for a specific item, specification, or drawing during surveillance inspections. Gaging failures will be reported in detail and the report will contain the following information where applicable.

(1) NSN and lot number.

(2) Sample size.

(3) Type of failure.

(4) Number of failures.

(5) Gage drawing and revision number.

(6) Gage serial number.

(7) Number of passes since calibration.

(8) Gage dimensions at last calibration (if available).

(9) Actual measurements of item failing to gage.

(10) All other defects observed are to be identified.

g. Data required by paragraph 2-8f for individual items that fail to gage without causing lot rejection will be compiled and reported by letter or email on a quarterly basis to addressee in paragraph 1-5.d.(1).

h. Lots rejected for failure to gage during IRI will be reclassified to condition code L and reported on SF 368 (Quality Deficiency Report). The SF 368 will contain the information required in paragraph 2-8f and will be preceded by a priority message to addressee in paragraph 1-5.d.(1) if the defect encountered is classified as critical.

i. Lots rejected according to Table 2-3 for failure to gage during other than IRI will be reclassified to condition code D (for major or minor defects) or J (for critical defects) pending receipt of disposition instructions from JMC. The information required by paragraph 2-8f above will be reported to addressee in paragraph 1-5.d.(1) by message (for critical defects) or memo (for major or minor defects).

2-9. Condition Codes.

a. Information on the use of condition codes can be found in Appendix C.

b. All condition codes must be assigned by a QASAS. QASAS must review and approve any reclassification action.

Table 2-1. Periodic Inspection Intervals

Item	Category
Activators	X
Additive Jacket	Y
Ammunition Fixed and Semi-Fixed, 37mm through 165mm for Guns and Howitzers:	
a. AP, APERS, HE (all types), WP, TP, Canister, Blank, and Illuminating	W
b. Chemical, Colored Smoke, HC Leaflet, Pyrotechnic, Riot Control.	X
c. Cartridge, 105mm,Semi-Fixed for Howitzer Assembled with M67 Propelling Charges Less Than 15 Years Old (except M84 Series HC, Smoke, and M629 Tactical CS)	Y
d. Cartridge, 105mm, Semi-Fixed for Howitzer Assembled with M67 Propelling Charges 15 Years or Older, M84 Series HC Smoke, and M629 Tactical CS	Z
e. Cartridge, 105mm, Semi-Fixed for Howitzer Assembled with Propelling Charges Other Than M67	W
f. 120mm Tank Rounds	Y
Ammunition for Mortars (Mono Pack)	Z
Ammunition for Mortars (Jungle Pack):	
a. HE, WP, and Practice with Explosive Components	V
b. Practice without Explosive Components (Inert)	U
c. FS Smoke, Leaflet Riot Control	X
d. Illuminating	W
Ammunition for Mortars (Regular Pack):	
a. Practice without Explosive Components (Inert) and Illuminating	W
b. HE, WP, RP, Practice with Explosive Components, Chemical, FS Smoke, Leaflet and Riot Control	X
Ammunition for Recoilless Rifles	X
Ammunition, Close Combat Mission Capability Kit (CCMCK)	W
Ammunition, Inert, All Types	W
Ammunition, Small Arms, through 30mm (except through Cal .50 Packed in Steel Cans with Gaskets)	W
Ammunition, Small Arms, through Cal .50 Packed in Steel Cans with Gaskets (including Inert SAA)	R
Bag Loading Assemblies for Mortars	Y
Bangalore Torpedoes	X
Black Powder Charges:	
a. In Hermetically Sealed Containers	Y
b. Not in Hermetically Sealed Containers	Z
Blasting Caps, Electric and Non-Electric	V
Bombs:	
a. HE, Non-Cluster Type, Unfuzed	U
b. Fragmentation and WP Unfuzed	W
c. HE, Fragmentation, WP, Fuzed or Packed with Fuze, and Photoflash	Y
Boosters, All Types	X
Bursters	Y
Canisters, Smoke	Z
Cartridge Actuated Devices (CADs)/Propellant Actuated Devices (PADs)	W
Note: All CAD/PAD items listed in Appendix D of TB 9-1300-385 and TM 43-0001-39 are Inspection Category W (5 years). This includes DODICS MS80 and MS90 series Canopy Removal Det Cords and DODICS SP02 and SP03 Thin Layer Explosives.	
Cartridge, Bomb Ejection	W
Cartridge Cases, Primed:	
a. Artillery	W
b. Small Arms	Y
Cartridge, Photoflash	W
Charge, Practice, Hand Grenade	Z
Coupling Base with Primer	Y
Delay Elements and Delay Plungers:	
a. Hermetically-Sealed Elements	Y
b. Not Hermetically-Sealed	Z
Demolition Kit, Projected Charge	X
Demolition Block Charges, C4 or TNT	V
Demolition Block Charges (except C4 or TNT)	X
Destroyers, All Types (Document, Cryptographic Equipment, File)	Z
Destructors	Y
Detonating Cord:	
a. In Hermetically-Sealed Container	W
b. Not in Hermetically Sealed Container	Z
Detonation Simulator, Explosive M80	Z
Detonators	Y
Dispenser, Aircraft Mine, M56 and Practice M132 Loaded, and Reload Kits	Y
Dispenser, Riot Control	X
Dynamite, Military (see paragraph W-5 for Commercial Dynamite)	Y
Expelling Charges:	
a. Black Powder Filled	Z

b. Propellant Filled ..... Y

Explosive Bolts X

Fire Starters ..... Z

Firing Devices ..... Y

Flares ..... Z

Fuse, Blasting, Time ..... Z

Fusee ..... Z

Fuzes, All Types except Fuzes with Black Powder Time Train Rings or Unsealed Black Powder Delay Elements:

a. Artillery, All Container Types ..... W

b. Grenades, All Container Types ..... Y

Fuzes Containing Black Powder Time Train Rings or Unsealed Black Powder Delay Elements ..... Z

Grenades:

a. Practice, without Explosive Component, Inert ... W

b. TA, Riot Control X

c. HE, HEAT, Offensive, WP, Practice with Explosive Components ..... Y

d. Colored Smoke, HC and Incendiary ..... Z

High Explosives, Bulk X

Igniters, All Types ..... Z

Ignition Cylinders ..... Z

Incendiary Devices, All Types ..... Z

Increment, Propellant ..... Y

Inert Ammunition, All Types (except SAA Packed in Steel Cans with Gaskets) ..... W

Inert Components and Metal Parts for Ammunition Items ..... W

Initiators for Bomb Fuzes X

Launcher and 35mm Cartridges CS ..... Z

Launcher and Grenade, Smoke M176, M226 ..... Z

Mines:

a. APERS, AT, Practice with Explosive Components X

b. Practice without Explosive Components, Inert, Empty ..... W

Packing Materiel ..... R

Primers:

a. Artillery ..... W

b. Small Arms ..... .Y

Projectiles Separate Loading and Naval Separated:

a. Unfuzed non-ICM HE (except 8-inch M424) ..... U

b. Unfuzed ADAM, Baseburner, HERA, ICM HE, Illuminating, Practice with Explosive Components RAAM, WP ..... W

c. 155mm M485 (D505) ..... Y

d. Fuzed ADAM, Baseburner, HE, HERA, Illuminating, Practice with Explosive Components RAAM, WP ..... Y

e. Colored Smoke, HC X

f. 8-inch M424 X

Projectile 64mm, Riot Control M742, M743 ..... Z

Propellant, Bulk and Component Charges ..... Y

Propelling Charge, Separate Loading:

a. First Interval ..... R

b. Subsequent Interval V

Propelling Charge, Separate Loading (Navy) ..... W

Reducer, Flash ..... Y

Rocket Motors X

Rockets, Complete Rounds:

a. Flechette, HE, WP, RP, MPSM and Practice X

b. Flare and Illuminating ..... Y

c. Incendiary, Riot Control ..... Z

Shaped Charges ..... Y

Signals ..... Z

Simulators ..... Z

Smoke Pots ..... Z

Spotting Charges ..... Z

Squibs ..... Z

Supplementary Charges X

Thermal Batteries X

Thickener ..... W

Tracers, All Types ..... Y

Warheads, Warhead Sections:

a. Flechette, HE, WP, RP, and Practice with Explosive Components X

b. Flare and Illuminating ..... Y

c. Incendiary, Riot Control ..... Z

Table 2-2. Periodic Inspection Intervals

CATEGORY	INTERVAL (YEARS)
R	10
S	9
T	8
U	7
V	6
W	5
X	4
Y	3
Z	2

Table 2-3. Sample Sizes and Acceptance/Rejection Numbers.

Sample Size				Accept/Reject Numbers (Defectives)					
Item	Note	SAA	Other	Critical		Major		Minor	
				AC	RE	AC	RE	AC	RE
Outer pack	(1)	20	20	0	1	1	2	2	3
Inner pack		20	20	0	1	1	2	2	3
Belt, 5.56-mm	(2)	10		0	1	1	2	1	2
Belt, 7.62-mm	(3)	10		0	1	1	2	1	2
Belt, .30 cal.	(3)	10		0	1	1	2	1	2
Belt, .50 cal.	(3)	10		0	1	1	2	1	2
Belt, 20-mm	(3)		10	0	1	1	2	1	2
Belt, 30-mm	(3)		10	0	1	1	2	1	2
Item (Other) (Individual Lot)			20	0	1	1	2	2	3
Item (Other) (Cluster Lot)			32	0	1	1	2	3	4
Item (SAA) (Individual Lot)	(4)	300		0	1	14	15	21	22
Item (SAA) (Cluster Lot)	(4)	400		0	1	10	11	21	22

Notes to Table 2-3:

1. Inner pack and item samples must be selected from a minimum of ten outer packs. Additional outer packs must be inspected at either the inspection or storage location(s) to make a total sample size of 20.

2. If rounds are linked, a belt consisting of 6 links and 6 cartridges shall be capable of withstanding a tensile load of 19 lbs minimum without separation. Load shall be applied at a uniform rate and belt shall remain under tension for a minimum of 30 seconds.

3. If rounds are linked, a belt consisting of 25 cartridges and 25 links shall be capable of withstanding a tensile load of 25 lbs for 7.62-mm and .30 cal., 100 lbs for .50 cal. except with M2 links which should be 80 lbs, and 115 lbs for 20-mm without separation. Load shall be applied at a uniform rate and belt shall remain under tension for a minimum of 30 seconds. No test for belts of 30mm is required.

4. For the purpose of Table 2-3, SAA is defined as up to and including caliber .50.

5. Chapter 12 contains accept/reject criteria for Security Assistance Program inspections.

CHAPTER 3
SURVEILLANCE SUPPORT TO AMMUNITION FUNCTION TESTING

3-1. General.

a. Tests are performed at designated storage installations, ammunition test facilities, or laboratories according to procedures in the item's supply bulletin (SB) or ammunition surveillance test procedures (ASTP). These publications prescribe the sample size, equipment to be used, test methods, data to be recorded, and the criteria for evaluating the lot tested.

b. Lots selected for function test represent the world wide stockpile.

c. The year designation pertaining to ASRP testing will refer to the fiscal year in which funding for the testing is appropriated, regardless of the fiscal year in which testing is intended to be performed or actually conducted.

d. The primary responsibility for world-wide ammunition surveillance organizations is preparation of samples for shipment to the testing activities.

3-2. Ammunition Stockpile Reliability Program (ASRP) Specific Requirements.

a. Preparation of Ammunition Samples for Function Tests.

(1) JMC Quality Engineering Division (QAE) distributes a list of lots nominated for testing annually to each storage site/activity. The surveillance organization will notify JMC QAE regarding availability of candidate lots.

(2) The storage site/activity surveillance organization will monitor shipping actions to ensure arrival of surveillance samples at the test facility on or before the required delivery date (RDD).

(3) Selection and preparation of samples for shipment to a test facility will be as follows:

(a) Samples selected will represent the entire lot in storage at the specific site/activity.

(b) Ammunition lots will be in their current condition code at the time of test. Lots selected for shipment may not be CC-A. To ensure that the nominated lot has had no significant change since the last inspection, all lots with inspection intervals expiring prior to the RDD for the samples will undergo a readiness inspection prior to or during sample selection.

(c) It is permissible to ship two or more lot samples within one shipping container provided each lot sample is fully identified and separated. Different models and types are also permissible within the same shipping container, provided positive identification of samples is maintained.

(d) Correct NSN and DODIC for the functional lot will be stenciled on the outer packing boxes and must agree with the NSN/DODIC shown on the shipping documents. Shipping documents and containers will be annotated "FOR ASRP FY__".

(e) Samples will be maintained on stock records under the NSN/ DODIC of the functional lot.

(f) The sample size required for Small Caliber Ammunition (SCA) surveillance testing will be furnished with the request for samples. It is permissible to exceed the sample size by shipping full metal containers in sufficient quantity to provide the required sample. It is not necessary to delink and repack samples.

(g) Candidate lot test samples at the installation will be assigned condition code D (CC-D) and obligated for shipment. The material release order (MRO) for shipment of test samples to the test facility will normally be issued by the JMC Munitions and Logistics Readiness Center (MLRC).

(h) The shipping container must comply with Title 49 CFR.

(i) Selection of samples and inspection results as applicable will be documented on the DSR.

(j) The DSR will be forwarded to the testing facility upon shipment of samples.

(k) All samples will be selected by or under the supervision of a QASAS.

(l) Furnish a Report of Shipment (REPSHIP) to the designated test facility and JMC QAE.

(m) Hermetically-sealed containers, waterproof bags, lead foil envelopes, etc. (that would be opened for an inspection conducted in conjunction with sample selection) will not be opened on samples requiring a wet phase test of the sealed container by the SB or ASTP.

b. Function test at designated facilities.

(1) Scheduling of function test will be coordinated with JMC QAE.

(2) Results of function test will be uploaded directly into MHP.

(3) Notify JMC QAS/QAE by the most expeditious means when a critical defect is encountered during the test.

(4) Coordinate suspension of testing with JMC QAE.

(5) Forward photographs and videotape of malfunctioned items to JMC QAE.

(6) Maintain fragments of malfunctioned items pending receipt of disposition instructions.

(7) Submit malfunction reports to JMC IAW AR 75-1.

(8) Function testing will not be discontinued at the point where sufficient functional defects have been observed to reject the lot involved. All samples shall be tested to acquire as much data as possible.

c. Laboratory Tests.

(1) The JMC QAE manages the stockpile laboratory tests of ammunition. These tests are conducted IAW the ASTP for each item tested. Destructive and/or nondestructive tests are performed to detect trends or changes in the item's quality and to determine the items serviceability or safety status.

(2) Chemical stability tests for propellant and propelling charges are conducted IAW Chapter 13 which describes the Propellant Stability Program (PSP) and Propellant Reassessment Program (PRP). Memorandums and emails nominating candidate lots for the PSP are issued to the storage sites/activities annually. Refer to Chapter 13 for specific details.

CHAPTER 4.
AMMUNITION QUALITY ASSURANCE PROCEDURES FOR MAINTENANCE OPERATIONS

4-1. General.

This chapter prescribes responsibilities and procedures to ensure that ammunition assembled, maintained, modified, disassembled for demilitarization, or renovated at installations meets the established quality requirements.

4-2. Responsibilities.

a. The USAMC commodity commanders are responsible for furnishing the technical requirements for each ammunition maintenance program. As a minimum, the technical requirements will include:

(1) Depot maintenance work requirements (DMWR) or Letter of Instruction (LOI).

(2) List of required drawings and specifications.

(3) List of required ammunition peculiar equipment (APE).

(4) Quality standards.

(5) Lot number/suffix assignment criteria.

(6) Pre-renovation requirements.

(7) Post-renovation test requirements.

(8) Data card requirement.

(9) Reports requirement.

(10) Valid restrictions which will apply post renovation.

b. The ammunition operations organization is responsible for producing a product of acceptable quality. Operations must be performed according to an SOP that contains the detailed production techniques, standards, and process control necessary to produce a quality product. A pre-operational check must be performed prior to beginning maintenance operations. Process control is critical as product quality and overall cost of the operations are determined by the process control techniques employed.

c. The ammunition surveillance organization is responsible for management of the installation ammunition quality program. It includes:

(1) Ensuring an economical system to control product quality.

(2) Reviewing the work authorization (job order), SOP, Drawings, SB's, TM's and other required reference material for use by the operations organization prior to beginning the maintenance operation. Required procedures to review work authorizations are provided in Procedure C, paragraph 4-12.

(3) Constructing a quality audit check sheet prior to start of maintenance operations. (See Figure 4-4).

d. In addition to providing other pertinent information, the SOP is the foundation of the ammunition quality control program. For this reason, it is essential that each SOP contain production techniques in detail, standards, and controls necessary to produce a quality product. As a function of quality management, the ammunition quality assurance organization's responsibility is to ensure that each SOP contains as a minimum:

(1) The required quality characteristics for each operation.

(2) Detailed description of the quality standards.

(3) Method used to assure quality characteristics conformance (gage, visual, etc.).

(4) Operator quality checks.

(5) Quality assurance audit procedures.

(6) Specific safety requirements.

e. The ammunition surveillance organization will:

(1) Review the line layout and equipment setup during the pre-operational check.

(2) Review other procedural steps of the SOP that affect the quality of the product and safety of the operation.

(3) Evaluate the implementation of the SOP.

f. The Ammunition Surveillance Organization will utilize Quality Audit Procedures (reference paragraph 4-9) to:

(1) Review procedures to control the calibration of electrical measuring and test equipment, gages, and precision measuring instruments.

(2) Review procedures for control of non-conforming materiel.

(3) Verify the Quality Control procedures of the ammunition operations element.

(4) Verify the process produces a quality item using quality audit techniques. Quality audit check sheets must be completed during each visit made to monitor the maintenance/ production operation and are the only approved source for documenting a quality audit.

g. Determining process capability and maintaining control can best be accomplished by using statistical quality control techniques, such as X and R-charts, p-charts, np-charts, and c-charts. These are effective management tools and will be used by the ammunition organization wherever possible.

4-3. MIL-STD-1916.

MIL-STD-1916 establishes movement away from an AQL based inspection strategy to implementation of an effective prevention based strategy, including a comprehensive quality system and continuous improvement. The objective is to create an atmosphere where every noncompliance is an opportunity for corrective action and improvement rather than one where acceptable quality levels are the contractually sufficient goals.

4-4. Product Verification Sampling Plan.

MIL-STD-1916 was approved for use in April 1996 and will be used as the preferred method for acceptance of product. It requires the demonstration and maintenance of an effective process-focused Quality System. Maintenance operation elements are encouraged to submit their systems as an alternative to acceptance sampling requirements.

a. The operational element must have:

(1) A Quality System Plan.

(2) Prevention based system.

(3) Process focused quality system.

(4) Objective evidence that system works.

b. Alternative acceptance can be submitted for one or more contractually specified sampling inspection requirements or for a systemic alternate acceptance method. Submission is made IAW the requirements of MIL-STD-1916. If they do not have such a system, MIL-STD-1916 provides the preferred acceptance sampling plans. When using MIL-STD-1916, the following Verification Levels (VL) should be used:

(1) VL VII should always be used for critical characteristics.

(2) At the normal level of severity, use VL IV for major characteristics and VL II for minor characteristics if not otherwise specified.

c. Continuous sampling is the preferred method of performing acceptance sampling for inspection by attributes. Lot or batch sampling will be used if continuous sampling procedures are not employed (for example, if the operations organization lacks adequate screening capability). Continuous sampling procedures are outlined in MIL-STD-1916. In addition to sampling at frequency "f", the ammunition surveillance organization will monitor the screening phases to ensure correct application of proper "i" values and verification levels.

d. Inspection by attributes – MIL-STD-1916. If for any reason the continuous sampling procedure noted above is not employed (for example, if the operations organization lacks adequate screening capability), the appropriate plan from MIL-STD-1916 will be used by the ammunition surveillance organization.

e. Each inspection batch or lot will contain homogeneous material produced in a specified time interval (normally a single shift or day).

f. Inspection by variables: variables sampling plans are provided in MIL-STD-1916. Each inspection lot or batch will contain homogeneous material produced in a specified time interval (normally a shift or day). K and F Values will be provided upon request.

g. Inspection for critical characteristics: the operations organization will perform a 100% inspection for all critical characteristics. Surveillance will inspect for critical defects using VL VII and will always accept on zero defects and reject on one. The presence of a critical defect in any ammunition surveillance sample or in any other item which has passed 100-percent inspection by operation personnel will normally require rejection of all material processed since the process was last accepted regardless of which sampling plan is used. The extent of rejection may be modified depending on the circumstances creating the critical defect. If the defect cause can be isolated to a particular quantity of material or production interval then rejection may be limited to that quantity of material or production interval as determined by the QASAS in charge. Material that has been reprocessed and resubmitted for acceptance will be inspected IAW MIL-STD-1916.

h. Lots: continuous sampling procedures will always be on a moving product basis. Selection of samples for inspection by attributes may be on either a moving lot basis or on a stationary lot basis. Inspection by variables will be on a stationary lot basis. Inspections requiring disassembly will be performed on a moving lot basis as close as practical to the operations organization process on the part or parts being inspected.

i. Maintenance type operations of short duration and limited scope (5 days or less: these operations should be inspected using continuous sampling or lot/batch sampling plans. Regardless of the duration of a maintenance operation, a spot check or roving inspection may never be used in place of a quality audit.

4-5. Ammunition Lot Number and Suffix Assignment.

a. Ammunition to be modified, inspected 100-percent for a critical defect, or renovated will have a lot suffix assigned by the commodity command, or a lot number will be assigned locally as outlined in MIL-STD-1168. Assignment of local lot number must be approved by the commodity command. Suffixes or approval of local lot number will be requested from addressee in paragraph. 1-5.d.(1) for other Class V items. Additional information can be found in MIL-STD-1168.

b. Requests for lot suffix for SMCA managed assets should be e-mailed to addressee in paragraph. 1-5.d.(1). Organizations without e-mail capabilities may submit request by facsimile, or by mail to addressee in paragraph 1-5.d.(1). Lot suffixes are to be requested no earlier than 60 days and no later than 30 days prior to the start of approved or funded programmed projects. The ideal situation is for JMC/AMCOM to have 30 days from receipt of request to furnish the suffix to the requestor. Unplanned or unscheduled maintenance operations such as those, which occur during PREPO, AFLOAT operations or other unanticipated emergencies, are exempt from this limitation. The information in the request must include:

(1) A list including lot number/serial number, quantity, model number, and NSN of materiel to be reworked.

(2) Scope of rework to be accomplished, applicable DMWR and resulting model number and NSN if changed as a result of maintenance.

(3) List of replacement/added components involved by NSN, model, lot number, and manufacture date to include, where applicable, component

reassessment/ deterioration check test date. Lot suffix will be denied if these tests are not current.

(4) Established start date and date of availability of samples for shipment to proving ground (PG) for test.

c. Should an emergency situation arise (such as a change in scope of work, a component becomes unserviceable, or a component is received at the last moment, an expedited request for a lot suffix is in order.

d. All correspondence on lot suffix requests from U.S. Army organizations in Korea, Japan, and Hawaii must provide an information copy to addressee in paragraph 1-5.d.(3).

e. Examples of operations requiring lot suffixes are:

(1) Where new components replace like components (i.e., same model number).

(2) When a component is removed or added.

(3) Where munitions were declared unserviceable or suspended by the appropriate commodity command and require 100 percent culling, testing, etc.

(4) Where a lot number is to be assigned locally, such as in creation of a regrouped lot, the information required in subparagraph b above will also be furnished to the applicable commodity command. Concurrence for assignment of local lot number wil1 be obtained from the commodity command prior to initiating maintenance.

f. When a JMC-assigned lot suffix is not used, the office in paragraph 1-5.d.(1) must be notified in writing of desire to cancel requested suffix. When an AMCOM assigned lot suffix is not used, addressee in paragraph 1-5.d.(2) must be notified.

g. When a change in the scope of work or components to be used is contemplated after a lot suffix has been assigned, the applicable commodity command must be notified of the proposed changes by an amendment to the request for the lot suffix.

h. Revised ammunition data cards will be prepared and submitted IAW MIL-STD-1168 when any rework results in a lot number change (see also paragraph 11-2d). Lot will be maintained in CC-D until data cards are submitted.

i. To ensure uniformity of inspection/ classification, the following definitions of lot 'None', 'Mixed' and 'Unknown' are provided.

(1) Lot None: ammunition items and components without a lot number assigned at time of manufacture.

(2) Lot Mixed; ammunition items and components with a lot number assigned at time of manufacture that can be separated by lot when appropriate.

(3) Lot Unknown: ammunition items and components with a lot number assigned at time of manufacture that cannot now be identified and separated by lot.

4-6. Ballistic Test of Ammunition.

The commodity command determines the requirement for testing of components and/or end items.

a. A ballistic test request (BTR) will be prepared by the commodity command for ammunition requiring PG test. Copies will be furnished the testing agency. Sample shipping instructions will be furnished to the shipping installation. On selection and preparation of samples, the installation ammunition surveillance organization will coordinate with local supply and transportation organization to assure timely shipment of samples.

b. The commodity command will determine the requirements for ballistic testing of items reworked.

(1) Information submitted according to paragraph 4-5b will be reviewed by the commodity command to determine the necessity for ballistic test of the reworked lot. The submitting installation will then be notified whether or not ballistic testing is required.

(2) The commodity command will prepare a BTR for each reworked lot determined to require test. The BTR will provide necessary direction for selecting and shipping samples, methods of test, and acceptance/rejection criteria. Copies of the BTR will be furnished the test agency and the shipping installation.

(3) An MRO will be issued by the commodity command for the movement of all test samples to a PG for ballistic test.

(4) The test facility will furnish ballistic test results to the commodity command. On acceptance notification by the commodity command, action will be taken by the installation to place the lot in the appropriate condition code for issue and use.

(a) If retest is determined appropriate by the commodity command, the installation will be requested to furnish additional samples.

(b) Special instructions as outlined in test facility request or shipping and marking instructions contained in the original BTR apply. Reference will be made to the original BTR on retest sample shipment to maintain continuity.

(c) In the event of ballistic failure, the commodity command will, if appropriate, initiate a request for waiver/deviation for subject materiel and advise each installation of the commodity command decision.

(d) The materiel involved will be retained in CC-D pending final decision and disposition.

c. Data cards for each lot shipped in a and b above will be furnished the test activity with the documentation covering the sample shipment. A data card will also be placed in box number one of each lot shipped for test. If data cards are not available, coordination will be made with the commodity command prior to release of shipment.

d. Ammunition that is restricted or remains suspended following renovation will be reported to the appropriate commodity command to provide for lot number inclusion in TB 9-1300-385.

4-7. Reassessment of Bulk Propellant and Performance Verification of Bulk-Packed Components.

Reassessment of bulk propellant and performance verification of bulk-packed components will be accomplished IAW Chapter 13. Reassessment involves the test and evaluation of stored propellant to determine functional serviceability prior to loading into a major end item. Performance verification involves the test and evaluation of bulk-packed components to verify current performance still meets the requirements of the Lot Acceptance Test (LAT) of the bulk-packed components, as specified in the Load, Assemble, and Pack (LAP) specification for the component, prior to loading into a major end item.

4-8. Deterioration Check Test (Explosive Components).

a. Specific explosive filled components including primers, ignition cartridges and delay elements require a deterioration check test (DCT) IAW the applicable military specifications. The DCT is a test of functional characteristics and moisture content of the black powder in the component. The DCT ensures suitability for use of these components before assembly into complete rounds. A successful test will allow components to be used (uploaded) for a period of three years.

b. Effective component usage planning for maintenance, renovation and production processes is critical for components requiring DCT. Installation level ammunition managers and workload planners should identify components requiring DCT at least six months prior to projected use. Notify JMC CAD/PAD Quality Manager and Maintenance Program Manager to verify suitability for uploading components and/or scheduling required assessments at the addresses in paragraph 1-5.d.(20)(h) and (j). Inventory Management Specialists for all component applications may be contacted at address in paragraph 1-5.d.(20)(d).

c. Explosive component lots requiring a deterioration check test may be tested by the storing installation for local use. Prior to performing the test, telephonic or written notification to the offices in paragraph 1-5.d.(20)(h) and (j) must be made to assure that a local test will not duplicate test efforts underway or completed elsewhere.

d. Deterioration check tests of explosive components will be reported to the offices in paragraph 1-5.d.(20)(h) and (j) by DA Form 984 with documentation necessary for test evaluation.

e. The office in paragraph 1-5.d.(20)(h) will periodically issue letter instructions. Components that require testing will be listed by model and type.

f. When subject material is shipped between CONUS installations and the item has a current test, the receiving installation should be contacted by the shipping installation. This contact is to determine that the remaining portion of the required test interval will not expire prior to the intended date of use for the item.

g. When subject material is to be shipped to an OCONUS installation, it must have a minimum of one year remaining before expiration of test or assessment interval. To ensure that remaining time is compatible with overseas command's planned usage, the following must be accomplished:

(1) All lots selected for shipment to OCONUS will be telephonically reported to the office in paragraph 1-5.d.(20)(h) for coordination with consignee.

(2) The test or assessment expiration date will be annotated on the shipping documents.

h. Component lots may be uploaded up to six months after expiration of DCT provided the operation is continuous. The JMC Maintenance Program Manager must be notified if a break in the operation of over one week occurs or at the beginning of the six months extension date.

i. Ammunition components requiring DCT and without a current test will be assigned CC-D, defect code CAA870. Tests will only be conducted when a requirement exists to upload the components.

j. Any ammunition component failing DCT will be assigned CC-H. HQ, JMC will notify storage installations of lots failing DCT.

k. Upon completion of maintenance programs, disposition of components shall be requested from the JMC Maintenance Program Manager. Disposition requests shall include NSN, part number, lot number, condition code, and quantity.

l. For a listing of DCT items, go to the address in paragraph 1-5.d.(21)(n). Notify HQ, JMC Quality CAD/PAD POC of any discrepancies between Mil-Spec requirements and the listing posted on the surveillance website.

4-9. Basic Surveillance Audit Procedures.

a. The following are standard steps to follow when conducting an audit. Prior to conducting the audit:

(1) Create and maintain audit schedules for all operations to be audited.

(2) Obtain copies of and review MWO's, SOP's, drawings, Specs, standards and prior audit reports. Place special emphasis on prior Corrective Action Requests (CAR). Review MWO's IAW Procedure C, paragraph 4-12.

(3) Prepare audit checklist and develop sample plan IAW Procedure A (paragraph 4-10) and MIL-STD-1916.

(4) Brief operation team leader on purpose and scope of audit.

b. Conduct audit and record observations. An observation is a statement of fact made during an audit and substantiated by objective evidence. Observations may be positive or negative. The terms nonconformance, nonconformities and findings will be used interchangeably to describe and report failures to comply with specified product or quality system requirements (negative observations). Objective evidence is qualitative or quantitative information, records, or statements of fact pertaining to the quality of an item or service or to the existence and implementation of a quality system element, which is based on observation, measurement, or test and which

can be verified.

c. Conduct audit of non-conforming materiel process and record results.

d. Audit Frequency: It is anticipated that ammunition maintenance operations audits will be conducted on a daily basis. When this is not possible, increase batch and sample sizes IAW MIL-STD-1916.

e. Determine operation compliance and product acceptance IAW Procedure B, paragraph 4-11.

f. Corrective Action Requests (CAR) must be completed every time a non-conformance is observed. Figure 4-2 shows sample CAR. Figure 4-3 is an example of a completed CAR. CARs must have a suspense date.

(1) The first time a checkpoint is found not in conformance, the CAR is addressed to the Operation Team Leader with a copy furnished to the QASAS in charge.

(2) If the same check point is found non-conforming during a subsequent audit, a CAR is completed referencing both the original and current non-conformance. Include the control number (CAR No.) of the original CAR. This CAR is addressed to the Director of Ammunition Operations with copies furnished to the Operation Team Leader and QASAS in charge.

(3) If the same check point is found non-conforming a third time, a CAR is completed referencing both prior non-conformances, (including CAR control numbers). This CAR is addressed to the installation commander with copies furnished to the Director of Ammunition Operations, the Operation Team Leader and the QASAS in charge.

g. After conducting audit:

(1) Brief operation team leader on findings after each audit.

(2) Distribute CARs.

(3) Complete audit and CAR status logs (Figure 4-1).

(4) File audit checklists and CARs.

h. Review CAR status log monthly for open CARs past suspense date.

i. Send memo to operation team leader, Director of Ammo Ops and QASAS in charge if CAR response not received by suspense.

j. Schedule follow up inspection to review CAR compliance. Post follow up date on CAR, CAR status log and audit schedule.

k. Conduct follow up audit. Close out CAR if corrective action is effectively implemented.

l. If corrective action is not correctly implemented, issue second CAR referencing the original CAR and failure to correct the non-conformance. Include the control number (CAR No.) of the original CAR. This CAR is addressed to the Director of Ammunition Operations with copies furnished to the Operation Team Leader and QASAS in charge.

m. Follow up the new CAR's as outlined in paragraphs i and j above.

n. If corrective action is still not effectively implemented, a third CAR is completed referencing both prior CARs and failures to correct the non-conformance (include CAR control numbers). This CAR is addressed to the installation commander with copies furnished to the Director of Ammunition Operations, the Operation Team Leader and the QASAS in charge.

4-10. Procedure A: Audit Checklist and Sample Plan Preparation Procedure.

a. Audit Checklist Preparation:

(1) Extract all check points from item SB's, SOP's, TM's, MWO's and special inspection requirements directed by higher headquarters.

(2) List checkpoints on audit checklist and classify as critical, major and minor defects.

(3) Randomly select checkpoints to monitor during the audit. Each checkpoint is a sample. List the number of times you monitor each checkpoint next to that check point on the audit checklist. Continue to select and monitor check points until your sample size is accomplished.

(4) Sign and date the audit checklist and list the sample size.

b. Sample Plan Preparation (for inspection by lot or batch):

(1) Multiply the number of inspection check points for critical characteristics by number of rounds run since completion of last audit. This yields critical characteristic batch size.

(2) Using the batch size calculated in paragraph 4-10b(1) above, determine the sample size from Table II, MIL-STD-1916 with Verification Level VII. This gives the number of critical characteristic checkpoints that will be selected for the audit.

(3) Multiply the number of inspection check points for major characteristics by number of rounds run since completion of last audit. This yields major characteristic batch size.

(4) Using the batch size calculated in 4 paragraph -10b(6) above, determine the sample size from Table II, MIL-STD-1916 with Verification Level IV. This gives the number of major characteristic check points that will be selected for the audit.

(5) Multiply the number of inspection check points for minor characteristics by number of rounds run since completion of last audit. This yields minor characteristic batch size.

(6) Using the batch size calculated in paragraph 4-10b(8) above, determine the sample size from Table II, MIL-STD-1916 with Verification Level II. This gives the number of minor characteristic checkpoints that will be selected for the audit.

(7) Continuous sampling plans are provided in MIL-STD-1916.

(8) Remember that maintenance workflow limits the maximum number of samples that can be checked during an audit. When workload is such that an audit cannot be performed for several days and sample size becomes too great to allow performance of an audit, all production will be assigned CC-D or CC-J as determined by QASAS in charge.

(9) To minimize lot rework, it is necessary to identify batches of production. Daily production runs are the recommended batch grouping.

(10) Reduced audit intervals may be applied IAW MIL-STD-1916.

4-11. Procedure B: Operation Compliance and Product Acceptance.

a. Operation compliance and product acceptance will be determined through performance of quality audits using audit checklists.

b. If no deficiencies are noted, accept process and product produced since last inspection. Audit checkpoints will be divided between process and product at the auditor's discretion. i.e.: You may check the operators performance of the operation, check the item after he has finished his step, or both.

c. If discrepancies are noted:

(1) Complete CAR (See Figures 4-2 and 4-3).

(2) Critical or major discrepancies - exercise rework option that was chosen during MWO preparation/review. (Two options exist, rework of rounds run since process was last accepted or implementation of 100% inspection by a line operator deemed suitable by the audit team. These options will be weighed on a case-by-case basis during each work order review. The selected option will be included in the work order prior to job start.) If rounds are to be reworked, place production run since process was last accepted in appropriate unserviceable condition code based on nature of defect and requirements of SB 742-1.

(3) Minor discrepancies - Tighten inspection for reject check point IAW MIL-STD-1916. If no additional deficiencies are found, correct defective round and accept process and production. If additional deficiencies are found, reject process and production as in paragraph 4-11c(2) above.

4-12. Procedure C: Procedures to Review Ammunition Maintenance Work orders (MWOs)..

a. Determine type of MWO.

(1) Renovation MWO operations (lot suffix, open box and work on round, etc.) require audit checklist preparation and audit. Renovation MWO review is a function of the audit team.

(2) Pre-shipment MWO operations (for such things as palletization and outer pack re-marking) will be checked as workload permits. Pre-shipment MWO review is the responsibility of the shipping desk. Shipping desk will provide audit team an info copy of MWO after reviewing and initialing it.

b. Check for suspensions/restrictions on each lot to assure suitability for rework.

c. Determine shelf life, propellant reassessment and DCT of lots and components.

d. Check for applicable MINs, AINs, SOUMs, etc.

e. Review DSR, lot location and quantity records for each lot to be processed and verify lot condition is adequately addressed by MWO scope of work. Check for any ACR's that apply and applicable defect codes. Make any changes required to scope of work to assure that all maintenance required is performed to yield the desired product condition code.

f. Verify proposed condition code, lot number and NSN are correct. Ensure all condition code segments of lot are upgraded if possible.

g. Verify accuracy of all marking information in MWO. (Hazard class/division, PSN, UN S/N, NSN, lot number, etc.) (Check AMDF, Fed Log, drawings, Joint Hazard Class, etc.).

h. Check whether a lot suffix is required/received/correct. Verify lot suffix is included in MWO.

i. Verify MWO includes project start and completion dates.

j. Obtain a copy of written authorization for every deviation from required procedures.

k. Discuss rework contingency option with planners. Assure that rework option has been chosen and is listed on MWO. (Two options exist, rework of rounds run since process was last accepted or implementation of 100% inspection by a line operator deemed suitable by the audit team. These options will be weighed on a case by case basis during each work order review. The selected option will be included in the work order prior to job start.)

l. Assure all required references are on hand. Check for most current version using DA PAM 25-30. Order if necessary. (Drawings, TMs, SBs, MWOs, SOPs, etc.).

CAR STATUS LOG					
CAR #	AUDIT DATE	FOR DIR	NON-CONFORMANCE	FOLLOW UP DATE	CLOSE OUT DATE
0212	12/15/02	I	23ea CC:J mixed on 4 plts w/ non-CC:J stocks	1/4/03	resp rec'd 1/2/03-prob not resolved-discuss w/C,SDD
0213	12/15/02	I	1ea PB93 mixed on plt w/ PB92	1/4/03	resp rec'd 1/2/03-prob not resolved-sent to CT to seeif completed
0214	12/14/02	I	SDS qty 8ea, MDC & multi pack qty 1ea	1/4/03	
0214A	3/7/03	I	Follow up 9614	3/22/03	
0215	12/21/02	I	2ea Torque screwdrivers on TOW-1-96 set too low	1/2/03	5/9/03
0215A	3/7/03	I	Follow up 9615	3/22/03	5/9/03
0216	12/21/02	I	C&R test performed w/out test bay personnel barriers in place	Corrected OTS	12/21/02
0217	12/27/02	I	2ea PD68 picked up on record by inventory without notifying Surv. Rounds also picked up in incorrect CC (CC:P vice CC:F)		2/1/03
0217A	3/8/03	I	Follow up 9617		3/29/03

Figure 4-1. CAR Status Log.

CORRECTIVE ACTION REQUEST		CAR NO.
COMPANY/PROCESS/DEPARTMENT AUDITED ADDRESS		AUDIT NO. DATE OF AUDIT
AUDIT CRITERIA:		
AUDITOR	COMPANY/DEPARTMENT PROCESS REPRESENTATIVE	AREA AUDITED
NON-CONFORMANCE SIGNATURE _____ (COMPANY/DEPARTMENT/ACTIVITY REPRESENTATIVE) SIGNATURE _____ AUDITOR		
CORRECTIVE ACTION DATE FOR COMPLETION OF CORRECTIVE ACTION _____ SIGNATURE _____ (COMPANY/DEPARTMENT/ACTIVITY REPRESENTATIVE) DATE _____		
ACTION TAKEN TO PREVENT RECURRENCE OF NON-CONFORMANCE DATE FOR COMPLETION OF ACTION TO PREVENT RECURRENCE _____ SIGNATURE _____ (COMPANY/DEPARTMENT/ACTIVITY REPRESENTATIVE) DATE_____		
FOLLOW-UP AND CLOSE OUT PROPOSED FOLLOW-UP DATE _____ FOLLOW-UP DETAILS CAR CLOSE OUT DATE _____ SIGNATURE _____ AUDITOR		
CAR Form		

Figure 4-2. Sample CARs.

CORRECTIVE ACTION REQUEST		CAR NO. 9631
COMPANY/PROCESS/DEPARTMENT AUDITED ADDRESS DAO MSL DIV Bldg. 168 Team Leader Attn.: Joe Ammo cf: DMPO Planning		AUDIT NO. 1 DATE OF AUDIT 2/8/03
AUDIT CRITERIA: SOP # AN-0000-J-054		
AUDITOR QASAS	COMPANY/DEPARTMENT PROCESS REPRESENTATIVE Joe Ammo	AREA AUDITED EHB-1-96

NON-CONFORMANCE

P4 connection not shorted IAW procedures in SOP. (P4 wire cut and stripped ends covered with aluminum foil. Aluminum foil secured to wire with tape.) P4 leads connect to gas generator igniter. Improperly shorted igniter leads represent a potential safety hazard. This hazard is mitigated somewhat by the fact that the batteries are no longer present, the rounds are protected by the container and are scheduled for demil. Handling hazard at time of demil would increase.

SIGNATURE _____ SIGNATURE _____
(COMPANY/DEPARTMENT/ACTIVITY REPRESENTATIVE) AUDITOR

CORRECTIVE ACTION

Team leader and DMPO Planning office informed of non-conformance. Utilize existing SOP procedures or change SOP to allow cutting P4 cable, stripping ends of all three P4 cable wires and twisting and taping together to short.

Determine requirement to correct rounds processed using non authorized procedure.

DATE FOR COMPLETION OF CORRECTIVE ACTION____2/12/03_____

SIGNATURE _____ DATE _____

(COMPANY/DEPARTMENT/ACTIVITY REPRESENTATIVE)

ACTION TAKEN TO PREVENT RECURRENCE OF NON-CONFORMANCE

Deviation from SOP must be approved in writing by all staffing parties prior to adopting a change in procedure.

DATE FOR COMPLETION OF ACTION TO PREVENT RECURRENCE N/A: _____

SIGNATURE _____ DATE _____
(COMPANY/DEPARTMENT/ACTIVITY REPRESENTATIVE)

FOLLOW-UP AND CLOSE OUT
PROPOSED FOLLOW-UP DATE _____2/13/03_____
FOLLOW-UP DETAILS

CAR CLOSE OUT DATE _____ SIGNATURE _____
AUDITOR

Figure 4-3. Sample CARs.

S:	**NSN**	**Lot #**	**Acc:**	**DOM:**
	Lnch Mtr Lot #	**Whd Lot #**	**Rej:**	**Signature:**

CHECKLIST FOR AUDIT REPORT NO: COMB-X-02/COMB-X-02		**Date:**	**Page 1 of 3**
Item No.	**Requirement**	**Activity Compliance**	**Comments/Remarks**
1.	**SOP: Posted/signed/current?**		
2.	**ATR's completed for ammo movement?**		
3.	**Work Order present/correct version?**		
4.	**Torque wrenches & test equipment properly calibrated?**		
5.	**Overpack & missile checked during disassembly for obvious damage? (Major)**		
6.	**Correct missile P/N (13060893) received to be modified?**		
7.	**Both launch motor igniter housing and launch motor nozzle passed inspection? (Major) (Movement/splitting/breaking away/powder loss)**		
8.	**Old set screw teflon tip present?**		
9.	**Inside of tube inspected prior to inserting motor?**		
10.	**New set screw teflon tip present?**		
11.	**New set screw installed until protruding and then backed out?**		

Figure 4-4. Sample Quality Audit Check Sheet.

CHAPTER 5.
EQUIPMENT

5-1. General.

This chapter provides instructions for supply, certification, maintenance, storage, use, inspection, and disposition for ammunition gages; Test, Measurement and Diagnostic Equipment (TMDE); and Ammunition Peculiar Equipment (APE) used in ammunition quality assurance operations.

5-2. Field Service Ammunition Gages.

a. Ammunition gages are used for surveillance and inspection. The requirement for gages will be based on the following:

(1) Required for surveillance inspections and tests for items actually in storage or for items to be placed in storage.

(2) Required for scheduled preservation and packaging or maintenance.

(3) The quantity of each gage must be locally determined based upon factors such as:

(a) Concurrent surveillance and maintenance requirements.

(b) Similar operations at several locations.

(c) Anticipated production levels that will require more than one gage.

(4) FORSCOM, TRADOC and ARNG activities storing class V materiel are exempt from these requirements except as directed on a case-by-case basis.

b. The ammunition gage mission has transferred to the national maintenance point and included with ammunition peculiar equipment (APE) to support maintenance and surveillance programs. Ammunition gages are centrally managed and ownership reverts to Headquarters, Joint Munitions Command. A request for gages for materiel managed by SMCA will be submitted to addressee in paragraph 1-5.d.(6). Requisitions will include the following:

(1) Gage NSN and/or part number (NSNs and part numbers for gages may be found in Section III of TB 43-0180).

(2) Quantity and priority.

(3) Justification for gage (ammunition maintenance/surveillance operation to be performed).

(4) Supplementary address of the receiving installation.

(5) Length of loan.

(6) If gages required are replacement gages, include the reasons for replacement.

c. Shipping orders will be issued by the commodity command for shipment of gages to the installation. Two DA Forms 3023 (Gage Record) will accompany each gage.

d. Gages for materiel managed by AMCOM are covered in the TM or DMWR for the item involved.

e. Care and preservation.

(1) Ammunition gages are precision-measuring instruments, difficult to procure, and generally expensive. Careful and intelligent use and storage will result in longer gage life and reduce replacement or extensive repairs.

(2) Because ammunition gages are easily damaged and are sensitive to dust and corrosion, they will be adequately processed and normally stored in a suitable cabinet provided for that purpose. Extremely large/heavy gages that cannot be stored in cabinets will be kept on racks or tables and must be covered and stored inside buildings. The following procedures apply to care and preservation of ammunition gages

(a) Segregate the gages in a manner that will prevent them from damaging one another by contact.

(b) Never pile gages on top of one another.

(c) When gages are to be stored for short periods of time or over night, first clean each gage with an approved finger print neutralizer, rinse with a solvent and then apply a light noncorrosive oil to protect each gage against corrosion.

(d) When gages are to be stored for longer periods of time, process them according to TB 43-0180. Gages so stored will be examined quarterly to determine whether corrosion has set in.

f. Inspection and certification. Ammunition gages for use on materiel managed by SMCA will be inspected, checked, and processed according to TB 43-0180.

g. Excess gages and disposition. Gage requirements must be reviewed at least annually to determine excesses. Any gage that does not meet at least one of the requirements of paragraph 5-2a above will be reported as excess. Disposition instructions for excess SMCA managed gages will be requested from the address listed at paragraph 1-5.d.(6). The request must include the NSN, gage drawing number, nomenclature, and serial number for each excess gage.

5-3. Equipment.

a. TMDE. Common items of TMDE are listed in the TM, DMWR, or SOP for the item involved.

b. APE.

(1) Conventional ammunition. Standard APE has been developed for quality assurance tests and inspections (reference AR 700-20 and TM 43-0001-47). The operation and maintenance instructions for this equipment are contained in the appropriate APE manual. Requisitions for APE and manuals must be made according to AR 725-50 to addressee in paragraph 1-5.d(6). Installation, operation and maintenance of APE must be performed in strict compliance with the applicable APE manual and JMC directives. Instances of equipment failure or specific problems with stated directives must be expeditiously reported for resolution to address listed above.

(2) Non-standard APE is developed locally and

submitted to JMC ref paragraph 1-5.d.(6) for review, tested and approval for use. APE and Non-Standard APE is listed in TM 43-0001-37, APE Data Sheets.

(3) Large rocket and guided missile ammunition. Test equipment is listed in the TM or DMWR for the item involved.

(4) Records and reports required by DA PAM 750-8 will be maintained and submitted.

(5) Surveillance organizations will identify APE necessary to perform inspection of stored stocks and APE will be used during all applicable inspections.

(6) For FORSCOM, TRADOC, and ARNG, provisions of paragraph 5-2a(4) apply.

(7) Local modification of APE and Non-Standard APE is strictly prohibited.

(8) The proper level of decontamination must be certified and documented according to TB 700-4 for all APE prior to shipment or storage.

c. Locally developed equipment will be reviewed by installation safety office and approved by installation Commander prior to use.

5-4. Calibration Monitoring Program.

a. The ammunition surveillance organization will establish a program to ensure constant adherence to policies and procedures of the Army Calibration System that apply to tools and equipment assigned to all serviced ammunition organizations. (See AR 750-43, TB 750-25, TB 742-94-1, TB 43-180, and implementing documents.)

b. Written procedures will be established to assist the ammunition surveillance organization in ensuring that tools, gages, and TMDE in use during all operations involving ammunition are serviceable and have not exceeded the calibration interval. (See Chapter 10, paragraph 10-1c).

c. The records and reports used in calibration of Army equipment are outlined in DA Pam 750-8.

CHAPTER 6.
LARGE ROCKET AND GUIDED MISSILE AMMUNITION

6-1. Ammunition Surveillance Procedures:

Surveillance inspection requirements for AMCOM missiles, rockets, and components are contained in individual Department of the Army Supply Bulletins – Ammunition Surveillance Procedures. Requirements of SB 742-1 also apply.

6-2. Storage Monitoring Inspections (SMI):

Since most AMCOM missile systems require desiccant and humidity indicators, SMI's are a very important required inspection. SMI's must be conducted per intervals stated in the applicable SB. Intervals may be shortened depending on local storage conditions, or as deemed necessary by the QASAS-in-charge. Organizations storing desiccated systems must be knowledgeable and trained to promptly identify, report, and maintain these systems.

6-3. Testing and Equipment Requirements.

a. The command has mobile surveillance test vans that perform functional testing on the STINGER and HELLFIRE missile systems. These vans perform electrical checkout of these systems on a worldwide basis as scheduled by the applicable system Project Office and/or AMCOM RAM Engineering & System Assessment Div, RDEC addressee in paragraph 1-5.d.(2). The purpose of the functional test is to identify the current missile stockpile reliability with high confidence, to assure the user of wartime readiness and to segregate failing hardware.

b. This testing is normally independent of local visual inspections conducted in depots, ASP's, and unit basic loads, as conducted by assigned surveillance personnel per the applicable SB. However, considerations should be given to simultaneously conducting other required inspections (IRI, RI, PI, PII, SMI), if due. This could result in personnel and labor savings.

c. A QASAS/Ammunition NCO (MOS 89B), or other technically qualified person should accompany the Surveillance Test Team to assist in the coordination of the test/inspections and facilitate any administrative details. Test results will be briefed to the local commander or his representatives. The missiles found to be unserviceable will be reported on ACR or QDR, as appropriate.

CHAPTER 7.
TOXIC CHEMICAL MATERIEL

7-1. General.

a. This chapter contains specific instructions relative to surveillance operations involving toxic chemical munitions (TCM) and bulk chemical agents. Surveillance operations will be performed using this publication, other SBs, TMs, drawings, specifications, local SOPs, and other applicable publications. Selected TCM and bulk agents have been classified as solid or hazardous wastes. These materials are also regulated under the Federal Resource Conservation and Recovery Act (RCRA) or an equivalent authorized state program for waste management. The activities directed in this chapter do not supersede or diminish the requirements imposed by other federal, state, or local regulations, requirements, or agreements. Personnel involved with surveillance operations shall coordinate activities directed in this chapter with individuals that are responsible for the installation's compliance with environmental regulations.

b. Periodic inspections (PIs) are no longer performed on TCM and agents. Surveillance organizations will, nonetheless, emphasize those inspections/operations that are necessary to assure items are safe for storage, on-post movement, and demilitarization. Such efforts may involve, but are not limited to, storage monitoring, leaker isolation/containerization, special inspections, and assessments. Eliminating the PI requirement does not relieve surveillance organizations from reclassifying ammunition based upon information gathered during other types of inspections. Accurate classification of the stockpile is still required, to the extent that existing inspection protocols make this feasible. If sufficient information is available to justify assigning a new condition code, surveillance organizations will do so and submit a DA Form 2415 to the NICP at the address in paragraph 1-5d(7).

c. Technical assistance. Addressee in paragraph 1-5d(7), will provide technical assistance at the request of a chemical installation. All abnormal conditions encountered during surveillance operations will be reported in memorandum format via e-mail or fax to the above.

7-2. Definitions.

a. Confirmed Agent Detection. To be confirmed, an initial detection of chemical agent leakage must be corroborated by a second, different method of detection. Monitors used for detection are differentiated by the analytical methods employed.

b. Containment. A physical condition, which mitigates or prevents agent migration from munitions, bulk agent containers, agent vessels, packaged/overpacked items, or storage magazines. Containment may be achieved by overpacking, powered filtration, or passive filtration.

c. Filter Units. Any system of equipment that will separate airborne agents from ambient air by means of adsorption and prevent airborne agent from being exhausted from the storage structure to the outside environment. Air movement may be accomplished by means of a powered filtration unit with a motor blower (active filtration) or, a system such as a wind powered or natural draft device used in concert with an adsorbent unit (passive filtration).

d. Inspection Intervals. As listed in Table 7-1, two intervals are identified for the SMI of chemical surety items.

(1) Quarterly inspection interval. Quarterly inspection implies one inspection per quarter at approximately 90-day intervals. Intervals between quarterly inspections may not exceed 120 days or the end of the quarter in which they are due, whichever comes first. Subsequent inspections may be scheduled based upon either the originally forecast date of inspection or the actual date of completion.

(2) Annual inspection interval. Annual inspection implies one inspection per year at approximately 12-month intervals. This interval may be extended up to 15 months. If the inspection interval is extended, subsequent inspections will be scheduled based upon the originally forecast 12 month inspection date.

(3) Inspections not completed IAW the above scheduling guidelines will be documented by the QASAS-in-charge, and the documentation retained locally. The documentation shall include a full description of the circumstances that resulted in the overdue condition. Overdue inspections will be performed as a higher priority than routinely scheduled recurring inspections.

e. Leaker Lot. A munition lot so designated by Headquarters addressee ref paragraph 1-5d(7), because of a demonstrated, increased tendency to leak. Leaker lots are generally subjected to a more aggressive surveillance regimen to ensure prompt identification and control of agent leaks. Leaker lot designations are site-specific and do not extend to other installations storing the same manufacturer's lot, unless directed by addressee in paragraph 1-5d(7). The use of the term "leaker lot" within the context of this supply bulletin does not imply that all munitions within the lot are leaking.

f. Overpacked Munitions. Items packaged in one or more of the approved overpacks listed in Table 7-2. These items include, but may not be limited to munitions previously identified as leakers; M56 Warheads generated during the M55 Rocket Assessment; recovered chemical warfare material (RCWM); and munitions subjected to various Ammunition Stockpile Reliability Programs [including Surveillance Program Lethal Chemical Agents and Munitions (SUPLECAM), Surveillance Test Program – Metallurgical (STPMTL), etc] which have been drilled, sampled and plugged. Bulk agent in ton containers or munitions in original shipping and storage containers, such as spray tanks and M23 mines are not considered overpacked.

g. Short Term Exposure Limit (STEL). The maximum concentration to which unprotected chemical workers may be exposed for up to 15 minutes continuously.

h. Worker Population Limit (WPL). Maximum allowable 8 hour time weighted average concentration that an unmasked worker could be exposed to for an 8

hour workday and a 40 hour week for 30 years without adverse effect.

7-3. Documenting Results of Inspections, Maintenance, Ammunition Anomalies and Ammunition Transactions.

a. All meaningful information (e.g., results of inspections, tests, technical investigations, agent sampling, etc; and disposal process anomalies; maintenance; re-warehousing; etc) shall be recorded on the DSR Card. Documents cited to clarify or supplement DSR comments must be retained as part of the lot history. In addition, surveillance organizations should capture all information that could have an impact on waste munitions management or treatment. Accomplishment of Storage Monitoring Inspections may be recorded on the DSR Card or via a locally developed record keeping system. If a locally developed system is adopted, records attesting to the accomplishment of SMIs must be retained indefinitely.

b. The Chemical Materials Agency (CMA) ammunition surveillance element at demilitarization facilities will provide technical input, to include any unusual conditions encountered during demilitarization, to the host installation surveillance organization for posting on the Depot Surveillance Record (DSR) card. The surveillance office at the host installation will prepare the closeout remark when a lot is completely destroyed. A Chemical Accountability Management Information Network (CAMIN) report that identifies the storage installation, disposal facility, nomenclature, stock number, lot number, serial number (if applicable), destruction certificate control number(s), destruction end date associated with each destruction certificate, and the number of munitions destroyed will be physically attached to each DSR. The CAMIN report may be by Lot or NSN.

c. DSR cards will be retained by chemical storage depots/activities for at least one year after completing a disposal campaign for each stock numbered item (unless plant closure occurs earlier than one year following the munitions campaign). Upon completion of this holding period, DSR cards will be forwarded to the addressee in paragraph 1-5d(7), for records retention by the NICP.

7-4. Chemical Agent and Munitions Demilitarization Operations.

a. Chemical agent and munitions demilitarization operations include those performed in support of CMA, involving the Project Manager for Chemical Stockpile Disposal (PMCSD), the Project Manager for Alternative Technologies and Approaches (PMATA), and the Product Manager for Non-Stockpile Chemical Materiel (PMNSCM).

b. Ammunition Surveillance Plan requirements are as follows:

(1) Each government and Systems Contractor (SC) organization within CMA will comply with the requirements of CMA Regulation 742-4, Ammunition Surveillance Program. Each PMCSD and PMATA government field office will develop and implement a local Ammunition Surveillance Plan that clearly defines government roles and responsibilities in the demilitarization program. (PMNSCM requirements are spelled out in CMA Regulation 742-4).

(2) All Ammunition Surveillance Plans will include the requirements of CMA Regulation 742-4 as well as site-specific ammunition surveillance requirements and responsibilities. The ammunition surveillance chain of command within the organization must be spelled out in the Plan. Circumstances wherein personnel are permitted to stop operations must also be clearly defined in the Plan.

(3) The SC will incorporate ammunition surveillance requirements in appropriate local procedures and/or in a matrix, as described in CMA Regulation 742-4. The frequency of oversight visits to the operating areas, as well as specific areas to be reviewed, will be defined and documented. Discrepancy and nonconformance reporting procedures will also be defined.

c. Only qualified personnel will perform and/or monitor the performance of ammunition surveillance duties. Government personnel will be QASAS or, in the event QASAS are not available, personnel with locally acceptable training and/or experience. The SC may utilize a variety of personnel from within their organization; i.e., ammunition surveillance, QA/QC, safety, surety, environmental, etc.

d. The performance of ammunition surveillance duties is both a SC and a government responsibility. The SC must implement specific requirements. The government is obliged to verify implementation, monitor SC performance, and also to implement specific requirements IAW the provisions of CMA Regulation 742-4 and the local Ammunition Surveillance Plan. This is intended to assure accuracy of documentation, control of the operational process, safety and integrity of operations, and compliance with established safety, surety, environmental, and operational standards. Ammunition surveillance activities include, but are not limited to, the following:

(1) Verify the presence of approved operational procedures (SOPs, LOPs, etc.) for operations being performed.

(2) Verify that procedures contain provisions to assure that incoming material receipt documentation correctly identifies the items being demilitarized by proper NSN, DODIC, lot number, quantity, and nomenclature.

(3) Verify the presence and serviceability of all required safety and protective equipment.

(4) Verify that required lightning protection and grounding system inspections and tests have been performed as necessary.

(5) Verify that required calibration/load test for equipment has been performed and is current.

(6) Verify that demilitarization area(s) comply with explosive safety and personnel limits.

(7) On a daily basis, verify that Destruction Certificate Memorandums are accurately prepared, signed as prescribed, and copies maintained.

(8) Verify compliance with all approved operational and safety procedures.

(9) Verify that noted operational deficiencies are properly documented and reported IAW site-specific requirements and the local Ammunition Surveillance Plan. Follow-up verification of corrective actions will be accomplished IAW local procedures to assure that deficiencies have been corrected.

7-5. Types of Inspections.

a. Storage Monitoring Inspection (SMI). SMIs will be conducted as indicated in Table 7-1 regardless of condition code. Each storage configuration (package, container, or item) will be visually inspected for evidence of leakage, condition of the outer pack, dunnage, or any other condition affecting suitability for continued safe storage, to the extent possible without re-warehousing. Items, whether in original shipping and storage container or overpacks, will have outer pack inspected without opening.

b. Special Inspections (SI)/Assessments. Will be performed as directed by the office referenced in paragraph 1-5d(7).

c. Magazine Inspection. Will be performed IAW Chapter 10 of this publication.

d. Storage Structure and Site Air Sampling. All TCM storage structures and sites will be monitored quarterly to the STEL concentration. Igloos containing leaker lots of non-overpacked M55 GB rockets will be monitored to the STEL concentration once every normal duty day, and those with non-leaker lots or overpacked leakers will be monitored a minimum of once weekly. Air sampling may be conducted more frequently due to site-specific requirements. The rational for the increase and the site-specific frequency will be documented and provided to the addressee at paragraph 1-5d(7).

Table 7-1
SMI Requirements For Toxic Chemical Items

Item	Not Overpacked	Overpacked
Ton Containers	Quarterly	N/A
Mines	Annual	Quarterly
Projectiles/Cartridges	Annual	Quarterly
Bombs	Annual	Quarterly
Spray Tanks	Quarterly	Quarterly
DOT Bottle	Quarterly	Quarterly
Rockets	Quarterly	Quarterly
SUPLECAM Samples	Quarterly	Quarterly
M56 Warheads	N/A	Quarterly

7-6. Detection, isolation, and containerization of leaking munitions and/or containers (hereinafter referred to as leakers).

a. Testing munitions and bulk agent containers for agent leakage will be performed with detection equipment or monitors listed in DA Pam 385-61. The proper use, maintenance and calibration of equipment will be IAW applicable equipment or users publications, TM's, TB's, and /or the organization's chemical agent monitoring plan and supporting Quality Assurance/Control (QA/QC) plan. Selection of equipment and procedures should be based on compatibility with the operation to be performed and, to the extent practicable, should incorporate the most sensitive and accurate technology available. Departures from this approach will be justified and documented in the leaker report.

b. The prompt identification, isolation, and containment of all agent leakage are of primary concern to ensure the safety of workers, the general public, and the environment. Monitoring is conducted IAW specified requirements for the type of munition or agent in storage, and prior to entry for the conduct of operations. If the presence of leaking agent is confirmed, steps will be initiated to ensure that isolation and containment operations are accomplished.

c. WPL monitoring may be required for the protection of unmasked workers conducting long-term operations. If agent is detected and confirmed at the WPL, an attempt must be made to identify the source.

d. When evidence of a leaking chemical munition or container in storage is noted, the source will be located, isolated, and contained as soon as practical consistent with all safety, security, and environmental protection requirements. The chemical storage site commander or his designated representative must evaluate safety and environmental risks associated with leakers prior to commencing or suspending leaker isolation operations. Risk assessment factors to be considered should include impending nightfall, weather conditions, protective clothing wear times, time of day, availability of personnel, supplies, or equipment, or any other condition that impacts risk. Isolation operations need not extend beyond normal duty hours and should not prevent the accomplishment of unrelated, concurrent operations such as environmental monitoring and safety in storage inspections.

NOTE

In addition to notifying addressee in paragraph 1-5d(7) IAW paragraph 7-8, the installation element responsible for chemical event reporting will be informed of any confirmed agent leak to determine whether submission of a chemical event report is required IAW AR 50-6.

e. The following procedures apply to chemical munitions and storage containers stored in enclosed structures.

(3) Agent detected:

(n) Close storage structure vents.

(o) Perform confirmation procedures. If chemical agent is confirmed at any level, follow procedures contained in subparagraph 7-6e(2). If confirmation cannot be obtained, the storage structure will not be considered contaminated and storage structure vents may be opened. However, actions should be taken to assess the cause of the original "false positive" agent detection.

(4) Agent confirmed:

(a) Vents remain closed.

(b) Install and operate powered filtration system(s) and open vents. Filtration system(s) will

remain in operation until leaker isolation and containerization/repair operations are completed, or until the agent source is eliminated.

(c) Begin leaker isolation and containerization procedures.

(d) An inspection of the materiel in storage will be conducted to the maximum extent possible without re-warehousing in an attempt to visually locate the source of the contamination. Packaged items will have the outer pack inspected without opening. Peeling, discolored, or blistered paint, or the presence of liquid is considered evidence of possible leakage. Positive tests will be confirmed with a second test. The presence or absence of leakage will be as indicated by the second test.

(e) If during visual inspection the leaking item cannot be located, individual stacks, pallets, or items will be shrouded for additional localized monitoring.

(f) Shrouding consists of covering individual stacks, pallets, or items with any type of plastic sheeting (as an alternative, individual items, in lieu of using plastic sheeting, may be temporarily encapsulated in a locally approved container) in order to create a separate environment and concentrate agent for monitoring purposes. Proper shrouding is accomplished using plastic sheeting free of rips and tears. Suspect stacks or pallets should be completely enclosed from top to the floor. It is not necessary for the enclosure to be taped or otherwise sealed to the floor. Shrouding individual items or containers may involve completely enclosing the suspect item or probable source of leakage. Projectile sample ports, lifting plugs or nose closures may be removed on the last pallet isolated provided they are removed, monitored and replaced one at a time.

1. Shrouding will be completed with minimal re-warehousing.

2. Individual shrouded stacks, pallets, or items will be monitored using low-level monitoring procedures in order to isolate specific stacks, pallets, or munition with elevated readings.

3. Shrouded stacks, pallets, or items with elevated reading will be visually inspected and monitored in order to further isolate the leaker(s).

4. If operators elect to use a container to concentrate agent vapor, items that are not confirmed as leakers must be removed from containers after isolation is completed.

(g) For M55 rockets, intrusive low-level monitoring of the shipping and firing container may be required to confirm the presence of leaking agent.

(5) When the leaking item is located, it will be repaired and/or containerized as soon as practical. Leakers should only be containerized after all other approved containment procedures have been attempted. Use of leaker overpacks must be minimized due to the resultant loss of visibility of energetic components and the increased difficulty in demilitarization that the overpacks create. However, worker safety will take precedence in any decision to containerize leakers. Vapor leakers should not be decontaminated. A heavy-grade plastic bag, 4 mil or thicker, may be used as an interim drip container for leaking liquid agent. Liquid leakers should not be decontaminated unless it will reduce the spread of liquid contamination or reduce the potential for personnel exposure during containerization. No water or decontamination solution (except residual liquid on the item), sand, vermiculite, or other material, except interim drip bags, will be placed in overpack containers with leaking munitions. When drip bags are present, care must be taken to avoid tearing or catching bags between gaskets and flanges during packaging. All records regarding leaker packaging will include remarks on the absence or presence of drip bags. This includes DSR card, DD Form 1577, leaker report, and any other applicable record.

(6) Leakers overpacked in propelling charge containers will be transported and stored vertically with the lid up. The round will be placed into the container base first.

(7) Once leaker isolation and overpacking have been accomplished, overpacked leakers must remain in the storage structure until air monitoring indicates that agent containment and cleanup operations have been effective. Additionally, the overpacked item will be shrouded and monitored to confirm no contamination is on the exterior of the container before the item can be moved/transferred to an appropriate storage location.

f. Magazine filtration and monitoring. Selected storage magazines may be equipped with fixed or mobile power filtration units, or passive filter systems. This equipment is intended to mitigate potential agent releases to the exterior of the storage structure and/or reduce agent concentrations within the storage structure during isolation and repair/containerization operations.

g. The interior of all magazines will be monitored to verify the effectiveness of operations intended to eliminate an agent source, including magazines equipped with filtration systems. However, powered filtration may mask a continuous agent source making it difficult to verify the effectiveness of leaker isolation, leaker packaging, bulk agent container repair, or general area decontamination. Prior to monitoring the interior of magazines equipped with powered filtration units, vents will be closed and powered filtration units will be shut down for a period of not less than twenty minutes. Sample point(s) within the storage structure should be determined based on the location of the original agent source and/or operations to eliminate the source.

NOTE

A vent with a powered filtration unit attached is considered closed when the powered filtration unit is turned off as long as the hoses connecting the filter to the magazine are serviceable and adequately secure.

(5) If the presence of agent is confirmed, powered filtration will be resumed and the vents can be reopened. Filtration and periodic monitoring will continue until the agent source is eliminated or no airborne agent can be detected. The frequency of

periodic monitoring should be determined locally, based on general and site-specific risk factors. Should agent levels in the storage structure not be eliminated after leaker isolation and containerization, further isolation may be necessary.

(d) If the presence of agent is not confirmed, filters should remain shut down, vents should remain closed, and the structure monitored at least once daily for three consecutive workdays. If all results are negative, vents may be reopened, powered filtration systems may be removed and no further action is required.

(e) If a powered filtration system is being operated because the presence of agent has been detected and confirmed, and action has not yet been taken to eliminate the source or has not been successful, the system need not be shut down to ascertain agent concentrations within the storage magazine. Filtration should continue until the agent source is isolated and contained or until airborne agent can no longer be detected. Remote magazine monitoring may be used as the basis for initial determination of levels of PPE for operators performing leaker isolation and repair/containerization, etc. General area air monitoring in the immediate vicinity of operations may require operators to modify levels of PPE.

(6) If a powered filter system is being operated in the absence of agent confirmation (e.g., pre-emptive or precautionary filtration in "high risk" structures), the vents will be closed and filtration systems will be shut off for at least twenty minutes prior to monitoring the interior of the magazine to confirm the presence or absence of airborne chemical agent. If airborne agent is detected and confirmed, powered filtration will be resumed and vents can be re-opened. Operations will proceed as described in paragraph 7-6e(2), above.

(7) Vents may remain open or closed while monitoring the interior of magazines equipped with wind or natural draft filtration systems. No waiting period is required prior to monitoring. If the presence of agent is confirmed these systems must be supplemented with a powered filtration system and guidelines in paragraphs 7-6e(2) through 7-6e(3) apply.

h. Leaker containment procedures for selected items. When overpacks are required, they will be selected from Table 7-2.

(1) Cartridge 105mm. Leakers should not be repackaged in a fiber container if the original fiber container can be removed. The cartridge case and propellant should be separated from the 105mm projectile whenever possible and the projectile and cartridge case should be containerized separately. Annotate records to fully identify the packaging configuration of the containerized cartridge and disassociated explosive and inert components.

(2) Cartridge 4.2-inch. Isolate leaking munitions down to the individual fiber container(s) w/o opening the fiber. Leaking muntions will be placed nose end up in the overpack container w/o removing the fiber, propellant or ignition cartridge. Annotate records to fully identify the packaging configuration of the containerized cartridge.

(3) M23 land mines. Leaking mines encountered during the course of operations will be returned to their original drum if serviceable. The requirement to repackage the leaking mine in the bottom of the drum is rescinded. It may occupy the top, middle or bottom of the drum. If a leaking mine is detected and confirmed by monitoring the interior of the drum (prior to removing mines), no attempt will be made to isolate the leaking mine. The lid will be replaced and the occurrence will be documented as a single leak. If the original drum is unserviceable, the mines and the original unserviceable drum will be overpacked.

(4) Overpacks. Leaking overpacks (to include propelling charge containers) will not be automatically double overpacked in Single Round Containers (SRC). The initial course of action is to torque lids, bolts, test plugs or other closures to the value listed in paragraph 7-7g(10)(a) through (n), the appropriate LOI or drawing. If leak continues, isolate the leaking overpack and place into an approved secondary overpack.

(5) Ton containers.

WARNING

Over an extended period of time in static storage, the threads of brass plugs and valves on GB ton containers have been known to deteriorate. To preclude dislodging a deteriorated brass valve or plug from a leaking GB ton container, no attempt will be made to tighten the valve stem(s) or cap(s), nor will any attempt be made to tighten a leaking plug.

(a) Upon detection of a leaking GA or GB ton container valve or plug, the following will be accomplished:

1. On ton containers with brass valves and plugs, all valves and plugs on that container will be replaced with steel plugs manufactured IAW drawing numbers SK 69-4-30 (valve) and SK 72-6-5 (plug).

2. On ton containers with steel plugs, in lieu of brass valves and plugs, the leaking plug will be tightened. Should tightening of the steel plug not mitigate the leak, the steel plug shall be replaced.

(b) Upon detection of a leaking VX or H-agent type ton container valve or plug, the following will be accomplished:

1. If the valve leaks from the safety cap or packing nut, the valve stem and safety cap should be tightened and the area decontaminated. Follow-up inspections shall be accomplished within three days and again after one week to verify effectiveness of corrective action. The safety cap may be removed and the area decontaminated, however this could result in the release of liquid agent.

2. If the valve leaks from threaded area, replace both brass valves with steel plugs.

3. Leaking plugs will be replaced with steel plugs. When leaking plug(s) is replaced, all

brass plugs on affected end of ton container will be replaced.

(c) If replacement of valves or plugs does not correct leaking condition, container contents will be transferred to a serviceable ton container.

(6) Items received at demilitarization facilities that leak prior to entry into the explosive containment vestibule (ECV) will be classified as a leaker and should be introduced into the demilitarization process or placed under engineering controls as soon as possible.

i. For items not listed above, refer to Table 7-2 for applicable overpack.

j. Overpack Container Requirements.

NOTE

Overpack containers for leaking chemical munitions do not require color code markings. Existing color code markings may not be a reliable source of information. Information pertaining to the explosive make up of an overpacked munition will be annotated on DSR card (s).

(1) All overpack containers will be visually inspected immediately prior to use IAW the inspection guidance referenced in paragraph 7-7g(5). In addition, individual containers requiring leak test must be leak tested prior to use, unless leak testing has occurred within the preceding 90 days.

(2) Overpacks used for containerization of leakers will have a properly prepared DD Form 1577 (Unserviceable [Condemned] Tag-Material) attached to container. Presence or absence of fibers, drip bags and propellant, type leaker, and leaker report number will be annotated on the tag and DSR card(s). Additionally, the following data will be placed on the container either by stencil or a vinyl label (similar to hazardous waste labels):

(a) NSN and DODIC.

(b) Nomenclature.

(c) Lot number.

(d) Quantity.

(e) Date packaged.

(f) Type leaker.

(g) Leaker report number.

(h) "NOSE END" on appropriate end of rocket container.

(3) Additional labels or markings are permitted consistent with operational requirements and RCRA permits. Overpacks marked prior to 01 March 2000 do not require remarking solely to comply with this criterion.

NOTE

Vinyl label must be a high strength, high conformity, solid safety hazard tape and resistant to solvents. All headings and markings will be legible and applied with permanent ink (Figure 7-1).

Figure 7-1
LEAKER LABEL

TOXIC CHEMICAL MUNITION LEAKERS

NSN/DODIC _____

NOMENCLATURE _____

LOT NUMBER _____

QUANTITY _____ TYPE LEAKER _____

LEAKER REPORT NUMBER _____

NOSE END
ON POST MOVEMENT ONLY

7-7. Overpacks for TCM and Agents.

a. This section provides a listing of approved types of overpacks for containerization of TCM and agents identified as leakers. Unless otherwise specified, listed overpacks are for depot storage and intra-depot movement only. Overpack requisitioning procedures, inspection criteria, and storage requirements are also included.

b. Table 7-2 lists overpacks authorized for containerization of specific items. Primary overpacks are intended for use in the packaging of individual TCM and agent items identified as leakers. Secondary overpacks are intended for use in the packaging of leaking primary overpacks.

c. Propelling charge containers are no longer authorized for use as a primary or secondary overpack unless specifically, and on a case-by-case basis, approved by CMA. However, site commanders may elect to retain some propelling charge containers in local retail accounts to confront accident scenarios that would require rapid packaging to mitigate

uncontrolled hazards or minimize prolonged worker stay-time in protective clothing. Inspection criteria for the propelling charge containers are listed in Table 7-4.

d. Leaking munitions containerized prior to the effective date of this SB do not have to be repackaged solely to meet this criterion.

e. Requisitioning Procedures. Overpacks may be requisitioned through the addressee in paragraph 1-5d(7). Questions pertaining to supply status of these containers will be referred to the National Inventory Control Point (NICP) (addressee in paragraph 1-5d(7)).

f. Each storage installation shall identify a portion of their retail stocks of overpack containers as contingency stocks. Contingency stocks are defined as those quantities of containers issued to local retail accounts that are projected for use during a two-year period. Two-year projections will be based on local leaker histories or, by exception, can be directed by higher headquarters.

g. Overpack Inspection and Storage Requirements.

(1) These requirements are applicable to containers authorized for use as overpacks for leaking chemical munitions and leaking overpacks in depot storage. Requirements presented herein do not supersede requirements of the Resource Conservation and Recovery Act (RCRA) or state environmental laws. Installations must ensure compliance with all current Environmental Protection Agency (EPA) regulations pertaining to these munitions and incorporate such information in local policy or SOPs, where appropriate.

(2) If procedures and requirements presented here are in conflict with those provided in container-specific Letter of Instruction (LOI) or similar work instructions, container-specific procedures will take precedence.

(3) Inspection requirements and intervals are established to ensure that a serviceable stockpile of overpack containers is available to address current and future leaker contingencies. Installation personnel must compile and retain records of all inspections. Periodically, this information will be requested by the NICP/NMP to assess long-term container performance. All container defects must be recorded (by serial number, if applicable) even if user maintenance is successful and the container is suitable for use.

(4) Rejected overpacks that cannot be repaired at the user level will be assigned CC-F and reported by memorandum to the NICP addressee in paragraph 1-5d(7).

(5) Inspections should be performed in a clean, dry environment, protected from adverse weather conditions, and in an area where the use of personal protective clothing is not required. The criteria for inspecting overpack containers can be found as follows:

(a) M55 SRC: Table 7-3.

(b) 10”X 96” SRC; 12”X 56” Non-Standard SRC Overpack, 12" X 56" SRC, 7”x27” SRC and 9”X41” SRC: Container-Specific LOI.

(c) Secondary Steel Container (SSC): Drawing Number DA 100/2, Loading and Bracing in SSC of M23 Mines in Drums Unitized 1 or 2 Drums per Pallet.

(d) AGM-12C Bullpup: DMWR 3-1325-E388-P1.

NOTE

Container-specific LOIs and drawings may be obtained by contacting addressee in paragraph 1-5d(7).

(6) Receipt Inspection. Installations will perform inspection for damage-in-transit when overpacks are received directly from a government or contractor production facility and the overpacks have been subjected to 100 percent leak testing and inspection by the manufacturer. Containers which were not subjected to 100-percent leak testing and inspection by the manufacturer will be 100-percent inspected and tested at time of receipt.

(7) Periodic Inspection.

(a) Overpack containers (except SSCs) that are either (1) maintained in the wholesale account, under control of the NICP or (2) issued to local retail accounts but not designated as contingency stocks, will undergo visual inspection of the external surface of the container so that 20 percent of the containers are inspected annually and 100 percent of the stockpile is inspected each 5 years. It is neither necessary nor desirable to access the interior of the container to perform annual inspections, unless serviceability is in question, based upon an external inspection. Unnecessary handling can damage the container. A leak test is not required but may be performed at the discretion of the inspector if serviceability is in question, based upon visual inspection.

(b) The SSC requires an external visual inspection, IAW applicable portions of Drawing DA 100/2 prior to issue to retail accounts. Annual inspections of (1) wholesale assets or (2) containers issued to local retail accounts, but not designated as contingency stocks, are not necessary. SSCs do not require a leak test unless directed by the NICP/NMP.

(c) 100 percent of contingency stocks at user installations will be visually inspected (internally and externally, including components) and leak tested (except SSC) annually.

(8) Leak Testing: SRCs will be helium leak tested using the Defense Ammunition Center (DAC) Validation Engineering Leak Detection System. Operator instructions for using this equipment are reflected in the DAC publication, “Portable Helium Leak Test Manual” dated October 2002. This manual provides general information, operating instructions and settings for the Harris Regulator Model 415-125, the Helium Dispenser/25C9001, and the Matheson LeakHunter Plus 8066. The DAC manual will be used in lieu of the manufacturer’s User Manual packaged with each Matheson LeakHunter Plus 8066. Containers that successfully pass this leak test can be assured of having an agent containment capability of at least $1x10^{-4}$cc/He/0.5psi/sec.

(a) For SRCs (except M55 SRCs) and modified overpacks assembled with shipping and

storage O-rings (normally Buna N or Neoprene) and pre-packaged O-rings (normally Butyl rubber), the shipping and storage O-ring should be installed to perform leak testing. The pre-packaged O-ring is to be used only during actual containerization operations.

(b) For M55 SRCs assembled with pre-packaged Teflon seals, a single Teflon seal should be used repeatedly until a test failure is encountered. Upon failure, the test seal will be destroyed and discarded, and a new test seal will be used. Extra Teflon seals, NSN 5330-01-302-0054, should be requisitioned from the NICP.

(c) The AGM-12C Bullpup Container will be leak tested using the APE 1052 modified with a gauge indicating a pressure range of 1-5 psi. The test will be conducted at 3 psi, with no pressure loss noted over a 3-minute period.

(d) A tag or label will be affixed to each overpack container indicating the date and results of last test.

(9) Care and handling of SRCs during Inspection. The following special precautions are to be observed during inspection, preventive maintenance, and preparation-for-use operations involving SRCs. If container-specific procedures are in conflict with guidelines published here, container-specific procedures will take precedence.

(a) The condition of the flange sealing surface and cover is critical to container performance. Care must be taken to prevent damage to these surfaces during inspection and testing. Foreign substances of any kind, to include skin oil, may interfere with obtaining a good seal. Particular care must be taken with unpainted flange or cover surfaces.

(b) Unpainted flanges and covers should be thoroughly cleaned with a specified solvent and liberally coated with a specified rust preventive coating after inspection and/or testing. Authorized solvents and rust preventive are listed below. Lubrication of the seal is not required.

(c) Authorized solvents are Wipe Solvent DS-104 or Wipe Solvent DS-108. Pertinent packaging and ordering information is provided below.

1. Wipe Solvent, DS-104: NSN 7930-01-367-1000, 4 ea x 1 gallon container, NSN 7930-01-367-1001, 24 ea x 16 oz squeeze tube.

2. Wipe Solvent, DS-108: NSN 7930-01-367-0995, 4 ea x 1 gallon container, NSN 7930-01-367-0994, 24 ea x 16 oz squeeze tube.

(d) The manufacturer's recommended non-petroleum based rust preventative is Rhodorsil Fluid 47 V 50 (Polydimethyl-Siloxane, from Rhodia Silicones, Prospect Plains Road, Cranbury, NJ 08512-7500. Rust preventative installed by the manufacturer (Rhodorsil Fluid 47 V 50 (Polydimethyl-Siloxane) should not be removed from machined mating surfaces unless, based upon the judgment of an inspector, it is necessary to do so to recognize and classify a defect(s). Acceptable substitutes are Grease, MIL-G-14931, Grease, Silicone, MIL-G-46886; or Dow Corning Vacuum Grease, 2021846-0888. No NSN or military specification has been assigned to Dow Corning Vacuum Grease. It may be procured through a regional Dow-Corning sales representative.

(10) Overpack container lid closure torque values are provided below:

(a) M10A4 - 225-350 inch-pounds.

(b) M13A2 - 200-325 inch-pounds.

(c) M14A2 - 175-300 inch-pounds.

(d) M16A2 - 200-325 inch-pounds.

(e) M16A3 - 200-325 inch-pounds.

(f) M18A1 - 225-350 inch-pounds.

(g) M18A2 - 225-350 inch-pounds.

(h) M460A2 - 225-350 inch-pounds.

(i) Test plugs for all propelling charge container lids are to be seated with a torque of 2.5 foot-pounds (at least 30 inch-pounds) minimum.

(j) ID Set M1, 8110-00-340-2006, lid closure torque requirements follows: The bolts/nuts shall be torqued diametrically opposed from each other to 30 foot-pounds (plus or minus 2 foot-pounds). In addition, bolt threads must be fully engaged to nut. A minimum of two threads must extend from the nut after torque.

(k) M55 SRC, 8140-00-286-0482: torque inspection plug to 25 ft-lbs (300 inch-lbs). For container cover, cross torque bolts in 20 ft-lbs (240 inch-lbs) increments to 60 ft-lbs (720 inch-lbs).

(l) SSCs used to overpack M23 Mines: The bolts will be torqued in an anti-clockwise pattern starting at the top right corner to 300 in-lbs. Once all the bolts have been torqued, the process will be repeated.

(m) AGM-12C Bullpup: Torque bolts to 150 in-lbs.

(n) SRC lid closure torque values are located within each container's LOI. For the 9" x 41", 7" x 27" and 12" x 56" SRCs, operator is required to cross torque bolts in 20 ft-lbs increments to 60 ft-lbs.

(11) Torque values are the same for containers whether the overpack is being used in containerization operations or during periodic serviceability inspections.

Table 7-2. Approved Overpacks for Storage of Toxic Chemical Munitions.

Item	Primary Overpack & NSN	Secondary Overpack & NSN
1. M55 RKT,GB/ VX	a. M55 Single Round Container (SRC) 8140-01-286-0482	10" X 96" SRC P/N ACV00402
2. 4.2 Inch & 105mm (Proj only)	7" X 27" SRC P/N S727001	NA, SEE NOTE 1
3. 105mm W/Ctg Case	7" X 27" SRC P/N S727001	NA, SEE NOTE 1
4. 155mm Proj	9" X 41" SRC P/N ACV00655	NA, SEE NOTE 1
5. 8 Inch Proj	9" X 41" SRC P/N ACV00655	NA, SEE NOTE 1
6. M23 Mines	Original Storage Container	Secondary Steel Container (SSC) 8140-01-310-6929
7. MK 94, 500 lb. Bomb (Palletized)	AGM-12C Bullpup (Modified IAW DMWR 3-1325-E388-P1)	SEE NOTE 2
8. MC-1, 750 lb. Bomb	AGM-12C Bullpup	SEE NOTE 2
9. TMU28/B Spray Tank	Original Storage Container	SEE NOTE 2
10. Previously Overpacked Leakers in M10, M13, M14 or M16 Propelling Charge Containers, or ID Set M1 Container		12" X 56" SRC, P/N ACV00649 12" X 56" Non-Standard SRC, NSN: 8140-00-01-375-7070

NOTES:

1. No secondary overpack is identified for the 9" x 41" and 7" x 27" SRCs. Due to extensive product testing and demonstrated performance history, it has been determined that the probability of either of these containers leaking is negligible. If a leak is detected, addressee in paragraph 1-5d(7) will be notified and sites will be provided with a plan to mitigate the situation.

2. Use of overpacks other than those identified require prior approval of addressee in paragraph 1-5d(7).

3. Leaking munitions containerized prior to the effective date of this SB do not have to be repackaged solely to meet the criterion of this table.

Table 7-3. Single Round Container (SRC) Inspection Criteria (M55).

Checkpoint	Corrective Action
Container body	
Cracks or holes.	Reject container.
Dents which preclude use.	Reject container.
Dents which do not preclude use.	None required.
Missing or damaged components.	Reject container.
Sealing flange machined surface	
Scratches which would prevent proper sealing.	Reject container.
Foreign material, rust, dust, paint chips, etc.	Clean and apply rust preventive.*
Flange bolt hole threads damaged.	Reject container.
Cover	
Cracks or holes.	Reject container.
Missing or damaged component.	Reject container.
Serial number (S/N) does not match container body (when applicable).	Attempt to find matching S/N. If not possible, perform leak test.
Loose inspection plug.	Apply Teflon sealant (tape or liquid); torque 25ft-lbs min.
Scratches in sealing surface/groove.	Reject container.
Foreign matter, rust, etc., in seal groove.	Clean and apply rust preventative.*
Container Seal	
Teflon seals: Flat spots, irregularities, deformation, or scratches. O-rings: Cuts, irregularities, hardness, or deformation.	Destroy seal. Request replacement from NICP (the addressee at paragraph 1-5d(7).
Bolts	
Damaged bolt or threads.	Replace bolt.
Container Assembly	
Fails Leak Test.	Reject container.**

*Leak test container upon completion of maintenance. If the rust cannot be removed with no coarser than fine grade steel wool and a soft rag, or there are pits or rough surfaces caused by the rust, reject the container(s).

**After initial failure, retest with a new Teflon seal or o-ring. If failure occurs a second time, reject container.

Table 7-4. Inspection Procedures For Propelling Charge Containers.

Checkpoint	Corrective Action
Metal container lid gasket missing, out of place, damaged, or deteriorated.	Replace gasket.
Failure to pass leak test.	Replace gasket and retest. If fails a second time, reject container.
Air Sampling plug missing.	Replace plug.
Damaged threads on air sampling plug/port.	Replace sampling plug/lid.
Container dented precluding use; i.e. munition would not fit into container, container would not seal.	Reject container.
Foreign material, rust, dust, paint chips, etc., which would not allow container sealing or allow markings to be stenciled on the container.	Repair and renovate container to serviceable standards. If not possible, reject container.

7-8. Reporting of Leaking Munitions.

a. All occurrences of confirmed positive agent concentrations will be telephonically reported to addressee in paragraph 1-5d(7). Should this condition exist for more than 1 day, periodic telephonic or email updates shall be provided as necessary to keep headquarters apprised of progress, but shall not occur less than weekly. As a closeout action, when the positive agent concentration no longer exists, and leaker(s) have been found and containerized, a written leaker report will be submitted.

b. Written and telephonic munition leaker reports must contain, as a minimum, the information reflected below in the format provided. If the prescribed format for the munition leaker report is too restrictive to convey details, provide additional narrative.

c. Items received at demilitarization facilities, which leak prior to entry into the explosive containment vestibule or the ton container drain station, will be classified as leakers. The leaker report must describe the ultimate disposition of these items, e.g., whether the items were processed through the demilitarization facility or overpacked and returned to storage.

d. Items received at demilitarization facilities, which leak after entry into the explosive containment vestibule or the ton container drain station, will not be classified as leakers. If processing can be accomplished, no reporting is necessary. If these items cannot be fully processed and are returned to storage, they will be reported by memorandum.

Leaker Report Form.

1. Leaker Report Number. Consists of an installation acronym, 2-digit calendar year and a sequential number, e.g., ANCA-99-03, TOCDF-04-28.

2. Leaker Report Date. DDMMYY

3. Chemical Event Report Number.

4. Date Agent First Detected. DDMMYY (Should be consistent with initial Chemical Event Report date.)

5. Date Leaker Isolated. DDMMYY

6. Item Data:

a. Nomenclature

b. NSN

c. DODIC: Individual reports will be submitted for each DODIC.

d. Lot number and/or serial number: Individual reports will be submitted for each lot number except when a leak is detected inside an ONC/EONC which contains multiple lots (see item 8a). If an ONC/EONC contains multiple lots, a single report will be submitted with the individual lot numbers and quantities listed here.

7. Leaker Category. State one of the following as appropriate.

a. Original item. Leak attributable to deterioration of the original item.

b. Overpack. Item that leaked in the past and was overpacked to contain leakage.

c. SUPLECAM. SUPLECAM or other stockpile reliability test item that has not previously leaked, even if it was overpacked as a precautionary measure.

d. Other. Explain any leaking item that does not fall clearly into one of the three previously stated categories, e.g., ineffective maintenance - changed brass valves for steel plugs and ton leaked the following day; dropped pallet while loading ONC for shipment to demil plant, initiating leakage.

8. Leaker Data.

a. Quantity and Type. State type of agent involved and define leak as vapor, liquid, or exudate. If liquid, give approximate quantity of agent leaked, e.g., approximately 1 teaspoon. If the individual leaker is not isolated due to introduction into the demilitarization process, document as a single round leaking e.g. if agent is detected within an unopened ONC/EONC, the leak quantity will be one regardless of the quantity of munitions inside the ONC/EONC.

b. Leak Location (Geographical). State where leaking munition was initially located at time of leak and where ultimately moved to, if applicable. Include building, truck, or ONC number, and general location inside any given structure, e.g., igloo 1202, grid (or stack) XXX; ONC no. 106 unloaded into TOCDF unpack area.

c. Leak Location (Physical). Physical location of the leak on the round, e.g., nose end sample port, around lifting plug, ton container valve safety cap. If unknown, so state.

9. Initial Operation and Detection.

a. Operation and Monitoring. State the type of operation being supported and related monitoring (or visual inspection) when presence of agent was first detected and confirmed, consistent with number 4. above. Examples include: Daily headwall monitoring; headwall monitoring for first entry in support of treaty inspection; general area air monitoring during inventory; visual inspection during first entry for SMI.

b. Detection Method Used and Reading. State initial and confirmation readings and method used in detection, giving exact readings if possible. Estimate readings if necessary and explain why estimated, e.g., MiniCAMS® initial readings estimated to be >120 STEL concentration - column saturated.

10. Isolation Operation and Detection.

a. Monitoring and Operation. Indicate leaker isolation process relating specifically to readings obtained, e.g., obtained readings of … under shrouded pallet, visual inspection then revealed liquid agent leaking from one round, confirmed with M8 paper.

b. Detection Method Used and Reading. Same type of information as 9b above, relevant to the isolated round.

11. Corrective actions taken. Include type and, if applicable, serial number of overpack used. State if packed with or without interim drip bag or other materials and any decontamination efforts conducted on round and/or structure.

12. Remarks. Include any additional information that may help to clarify conditions encountered during operations or serve as a basis for process improvement. Examples include, but are not limited to, unusual deterioration of munitions or packaging; filter breakthrough; agent confirmed during general area air monitoring (if not reported previously); agent release/detection outside the storage structure and related details, e.g., agent confirmed 25 feet downwind of structure w/ MiniCAMS® reading of 0.8 STEL concentration; equipment failure, personnel injuries/exposures or unique PPE issues; clarification of previously reported information that may have since changed, such as that contained in a Chemical Event Report. Cite previous leaker reports and overpacks, if applicable.

13. Point of Contact. The name and phone number of a QASAS who drafted the report and the name of an individual who was present during leaker isolation and containment operations - QASAS, toxic material handler, surveillance inspector, etc.

7-9. Storage Monitoring Inspection Procedures for Specific Items.

a. Ton Container. Quarterly SMI IAW paragraph 7-5a is required for all ton containers filled with bulk chemical agents.

(1) Visual. Each container shall be visually inspected for defects as defined in paragraph 2-7 and for evidence of leakage. Liquid, paint peeling, paint discoloration, or paint blistering will be considered as evidence of possible leakage. Vapor tests will be accomplished directly adjacent to container closures or other suspect areas. Leakers will be reported IAW paragraph 7-8 and handled according to paragraph 7-6.

(2) Ends of ton containers will be examined for presence of rust and/or corrosion. Minor rust or corrosion covering 25 percent or less of container end surface will be recorded, for information, on the depot surveillance record card. If minor rust or corrosion exceeds 25 percent of end surface, the container will be assigned CC-E and a DA Form 2415 will be submitted to the NICP at the address in paragraph 1-5d(7). If rust exists on areas immediately adjacent to valves or plugs in sufficient quantity to hinder detection of agent leakage, and de-rusting and repainting of areas is not performed during inspection cycle, container will be placed in CC-E.

(3) A ton container will be placed in CC-E for de-rusting, repainting, and remarking when any degree of rust or corrosion threatens to render identification markings illegible.

(4) Cylindrical surface of ton containers will also be examined for presence of rust or corrosion. Containers will be placed in CC-E when rust or corrosion on cylindrical surface has progressed to scaly, granular, or flaked condition accompanied with definite pitting or etching of metal, or with pits or irregular areas of material removed from item surface. Any lesser degree of rust or corrosion on cylindrical surface of containers will not result in a condition code change though it will be recorded for information on the depot surveillance record card.

(5) Ton containers need not be removed from the storage structure or stack solely for visual inspection of areas not accessible while in the normal storage configuration. If visual inspection indicates deterioration, container should be removed and given a more thorough inspection.

b. M55 GB Rockets. SMI procedures are located in Appendix AE of this regulation. The use of any other procedures must be authorized in writing by addressee in paragraph 1-5d(7).

c. Projectiles, fuzed and unfuzed.

(1) Agent leakage sometimes occurs at the juncture of the fuze or lifting plug and the projectile body. These leaks, if not detected early in the leakage process, often become “self-sealing”.

(2) Workers should be aware of this phenomenon and recognize that any built-up area between the fuze/lifting plug and projectile or the presence of a dry residue may be an indication of agent leakage.

(3) Dry residual agent leakers will be reported as “exudates” on the leaker report form.

CHAPTER 8.
BASIC LOAD INSPECTION AND TECHNICAL SUPPORT ASSISTANCE

8-1. General.

a. The following are to receive BLI and technical support assistance from QASAS. This will include technical assistance visits and inspection of operational load, training load, mission load and contingency stocks.

(1) Active Army.

(2) Reserve Component units and activities.

(3) National Guard units.

(4) Security forces at installations where AR 50-6 applies.

(5) Activities and individuals located outside the real property boundaries of coordinating and/or supporting installations.

b. Ammunition surveillance support (BLI and technical support) in CONUS will be implemented by scheduling support on a periodic basis as established in a letter of agreement between the command providing QASAS support and the recipient activity. Provisions of AR 5-9 also apply.

(1) Theater regulations will govern frequency of support OCONUS, but in no case will the visit occur less frequently than 12-15 months. This inspection excludes war reserve stocks in storage for customer issue.

(2) Training ammunition drawn for immediate use from ASPs is excluded.

c. DSR's are not required for the above stocks of ammunition (see paragraph 11-2a(1)).

d. Propelling charges for 155mm Howitzer M3 and M4 series Propelling Charges (1320-D540 and 1320-D541) with "Y" indicator are not to be cleared for shipment to Basic Load. Assign priority of issue, CC-C and/or lot selection code "O" to expedite the usage of serviceable stocks in training.

8-2. Inspection Requirements.

a. FORSCOM or TRADOC installations (post, camp, station) with assigned QASAS will perform inspection of stored conventional and guided missile basic load and training munitions under unit control no less frequently than 12-15 months. Appropriate SBs and TMs will be used for the inspection.

b. The BLI will be conducted by a QASAS, who may be supplemented and assisted by a military MOS 89B (SSG/SFC) and/or qualified wage grade or local national personnel. In addition, the unit inspected normally furnishes support personnel for efficient handling, unpacking, correction of minor deficiencies, repacking, and storage of munitions as required.

c. The local organization responsible for maintaining subject materiel may perform operator/organizational inspection/basic maintenance functions as authorized in the maintenance allocation chart of appropriate technical manuals. Any problems encountered that cannot be resolved locally will be brought to the immediate attention of the supporting QASAS. The results of such operations will be documented for review by the QASAS during periodic technical support visits.

d. BLI will be conducted on all uploaded munitions and all open (unsealed) containers. Munitions sealed in original package shall be opened and inspected to the extent necessary to verify serviceability based on such parameters as storage conditions, appearance of outer pack, lot size, or length of time in basic load.

(1) Barrier material packaged items will be treated according to paragraph 2-3.c.(4). Sampling criteria in paragraph 2-3 and table 2-2 do not apply.

(2) Ammunition lots must meet minimum serviceability standards for the specific type munition for retention in the basic load.

(3) The appropriate models and quantities of ammunition required to support the unit's applicable weapon systems will be in the UBL.

8-3. Technical Assistance Visit.

QASAS will conduct a review in the following areas in conjunction with BLI:

a. Explosive safety.

b. Ammunition storage.

c. Unit procedures for transportation of ammunition upload plans, disposition of excess ammunition including training ammunition, and investigating and reporting malfunctions (see paragraph 10-11).

d. Property books and ammunition records and reports.

e. Check lots against suspense/ restriction files (TB 9-1300-385) and AINs and MINs. Check that units have an adequate suspension system.

f. Assure that previously rammed projectiles are positively identified and are reclassified to CC-H for demilitarization. Verify that units have requested disposition instructions.

8-4. Reporting.

A memorandum format report will be forwarded to the unit commander within 30 days using local directives at theater or command level for distribution guidance with a copy sent to the appropriate materiel management activity. The memorandum will specify discrepancies noted and include recommended corrective action. For inspection of ARNG units, one copy will be sent to addressee in paragraph 1-5.d.(8). Response will be reviewed by the QASAS to evaluate corrective actions taken.

8-5. Establishment of Local Directives.

Supplemental guidance must be developed at local, theater, or command level to cover policies, procedures, and responsibilities for required basic load inspection.

CHAPTER 9.
CLASS V MATERIEL SUPPLIED TO NON-SMCA CUSTOMERS

9-1 General.

a. This chapter pertains to all Class V Army owned stocks, supplied to non-SMCA customers.

b. Terms and definitions:

(1) SMCA customers -- Army, Navy, Air Force, and Marine Corps.

(2) Non-SMCA customers – Federal, State and Local departments, agencies, or institutions; commercial corporations; U.S. Coast Guard; director of civilian marksmanship; rod and gun clubs; and veteran organizations; and Allies supplied Class V material by Acquisition Cross Service Agreements (ACSA).

9-2 Procedures.

a. Installations are required to obtain functional (performance) clearance for ammunition and explosive components including both shipments and in storage transfer of accountability. Shipment or transfer of accountability of caliber .22, shotgun shells and blank small arms ammunition does not require a functional clearance.

b. Materiel supplied to customers will comply with the following:

(1) Functional clearance by addressee in paragraph 1-5.d.(1).

(2) Materiel must be functionally serviceable. The materiel should have been accepted without waiver but waivered materiel may be cleared on a case by case basis.

c. Functional clearance will be obtained from addressee in paragraph 1-5.d.(1), by submitting Automated Functional Clearance Request Form located on JMC Surveillance Web Page at address in paragraph 1-5.d.(21)(n). The following information is required for clearance of candidate materiel:

(1) Customer.

(2) Nomenclature, NSN, and DODIC.

(3) MRO number.

(4) Lot/SN and quantity to be shipped.

(5) Date of manufacture and latest test data.

(6) Functional deviations or waivers from local records.

(7) Restrictions or suspensions.

(8) Latest inspection results.

CHAPTER 10.
AMMUNITION SURVEILLANCE PROGRAM FOR SAFETY AND LOGISTICS FUNCTIONS

10-1 General.

a. The organization performing an ammunition mission is primarily responsible for the safe and proper conduct of all operations.

NOTE

QASAS, military ammunition inspectors MOS 89B (SSG/SFC), and properly trained and certified civilian technicians (including local nationals in OCONUS locations) have the authority and responsibility to stop unsafe operations where imminent danger is involved.

b. The safety and logistics functions described in this chapter are the responsibility of QASAS personnel. These functions include inspection of buildings and areas in which ammunition and explosives are stored, including ASPs, PSPs, and proving grounds; outside storage; operations involving handling, storing, maintenance, shipping, research, development, test, evaluation, and destruction of ammunition and explosives; and transport vehicles and vessels used for transportation of ammunition and explosives.

(1) Safety while conducting operations, compliance with SOPs, ammunition identity (lot integrity), and serviceability are primary concerns of such inspections. Unsafe practices, methods, or conditions must be corrected immediately and reported through appropriate channels for long-term corrective action.

(2) The QASAS in charge will maintain close coordination with the directors of both safety and operations on matters affecting the explosive safety at an installation and furnish copies of magazine inspection reports, follow-up actions.

(3) Applicable safety, transportation, storage, maintenance, demilitarization, supply regulations, and directives issued by responsible commands will be used in conducting such inspections. In the absence of such documents, the policies and procedures detailed in this chapter will take precedence and be followed.

c. A SOP will be prepared prior to conducting any explosive handling operation. SOPs at AMC installations will be written in accordance with AMC-R 700-107. Other MACOMS will comply with DA PAM 385-64, Chapter 2 when developing SOPs, however, AMC-R 700-107 should also be used as guidance. Surveillance may develop other types of procedures for operations not including explosive handling as long as all applicable information required by AMC-R 700-107 is included. SOPs will be reviewed as directed by AMC-R 700-107. Other surveillance procedures shall be reviewed, as a minimum, biennially by the QASAS in charge for compliance with safety, operational and quality requirements.

d. The QASAS in charge will personally conduct periodic on-site reviews of ammunition operations to assure that these operations are being conducted satisfactorily from both a safety and a quality perspective.

10-2 Storage Buildings and Areas.

a. Magazines and other buildings in which ammunition and explosives are stored will be given a formal inspection annually (except as noted in paragraph 10-2.c.). Such inspections will be performed by QASAS who will record and report the results. A formal record of the inspection results will be maintained to include discrepancy reports forwarded to responsible installation activities and the resolution or corrective actions resulting from these reports.

(1) Inspection results will be considered part of the technical history of the items in storage.

(2) Any unusual or changing conditions encountered during an inspection that have or could have an adverse effect on any of the stored items will be recorded on appropriate DSR. QASAS will apply knowledge of such conditions on specific lots of materiel to consider the potential effect on item serviceability or suitability for continued safe storage.

(a) Such conditions, along with any potentially hazardous conditions, will be specifically noted and reported to the appropriate organization for prompt corrective action.

(b) The QASAS in charge may deem it necessary to conduct special inspections or adjust the assigned inspection intervals for materiel that has been adversely affected by such storage conditions.

(3) A re-inspection will be scheduled for locations where potentially serious conditions have been encountered to verify that they have been corrected.

(4) Conditions to be considered in the inspections of magazines and storage buildings include, but is not limited to, the following:

(a) Compliance with storage drawing.

(b) Segregation of lots and condition codes.

(c) Adequacy of aisles.

(d) Stability of stacks.

(e) Separation of stacks by safety distance where such are specified.

(f) Compliance with quantity distance limits in stacks and magazines.

(g) Storage compatibility of explosives and ammunition.

(h) Satisfactory housekeeping in the magazines for the type of materiel in storage.

(i) Suitability of the magazine for the type of materiel in storage.

(j) Condition of magazine, doors, and ventilators. (Magazine door flashings will not be inspected for defects and/or reported.)

(k) Maintenance of adequate firebreaks

(where required) around magazines and storage sites.

(l) Presence and proper types of fusible links on doors and ventilators where required.

(m) Adequacy, composition, and depth of earth cover should be checked every 24 months.

(n) Capability of magazine contents to continue to be stored safely.

(o) Presence of required condition code tags (paragraph 11-2) on unserviceable lots of ammunition.

b. Lightning protection systems within the ammunition area will receive a visual examination and a test for electrical continuity and adequacy of grounding at intervals contained in AR 385-10, DA PAM 385-64 and DoD 6055.90-M. These inspections and tests will normally be conducted by a designated operations organization within the installation. The procedures and the results of these inspections and tests will be monitored and reviewed by the ammunition surveillance organization to assure that the lightning protection systems are properly inspected and tested. Copies of all inspection and test results will be maintained IAW DA PAM 385-64. Suitable commercial test equipment or APE 1952, lightning protection system test equipment may be used.

c. At the discretion of the QASAS in charge, the magazine inspection interval may be increased to a maximum of 24 months or reduced to a minimum of quarterly depending on activity or local conditions which would increase or decrease the possibility for deficiencies to occur. Reasons for changing intervals (lack of funding or personnel does not constitute justification) must be documented.

d. Empty magazines will be inspected upon notification of removal of materiel. An empty magazine need not be re-inspected before being reused for storage provided that:

(1) It was inspected after it was emptied.

(2) Magazines and storage sites having had chemical surety materiel stored therein have been certified free of toxic hazard (AR 50-6).

(3) All defects noted during the inspection have been verified as being corrected.

(4) Use for storage is accomplished within 24 months following the last inspection.

(5) Empty magazines must be sealed with a numbered seal to assure that ammunition is not stored without proper notification of the ammunition, security, and surveillance organizations. Local procedures must be prepared to assure above notification. Integrity of seals will be assured at least every 6 months.

e. Any magazine or storage building that is to be used for storage of non-explosive or non-ammunition items (general supplies), or which is to remain empty for a long period of time, more than one year, should have the magazine inspection interval lengthened. Qualified facilities engineer personnel instead of the ammunition surveillance organization may conduct these inspections.

(1) The lengthened interval is to be based on local conditions but should not be less than 24 months and must not exceed 36 months. Continued magazine inspection is required to detect any damage or deterioration before extensive and costly repairs may be necessary for restoration.

(2) The surveillance organization will document and report any damage and deterioration to the appropriate installation organization for planning or programming of preventive maintenance so that the magazine remains suitable for ammunition storage. The correction of all deficiencies must be verified by the ammunition surveillance organization.

(3) Installations that have been identified under the Base Realignment and Closure act, need not conduct inspections on empty magazines. A final inspection will be made prior to base transfer. This final inspection is limited to a check for ammunition items or residue.

10-3 Ammunition and Explosive Materiel in Outside Storage.

a. Ammunition placed in outside storage will be given adequate continuing inspection to ensure that packaging is not damaged or deteriorated to the extent that ammunition contents are exposed in any manner not intended by the original design of the package.

(1) Any damaged packages will be adequately repaired before placing in outside storage. All ammunition will be stored in stable stacks with ventilation provided according to existing requirements.

(2) DA policy requires that outside storage of ammunition and explosive materiel be held to an absolute minimum.

(3) It is recognized that there are situations where outside storage may be justified provided materiel is stored per explosive safety standards. Examples of these situations are as follows:

(a) Size precludes storage in magazines.

(b) Materiel is presently stored outside and scheduled for demilitarization or maintenance.

b. A formal examination will be made quarterly of each outside site in which ammunition is stored. This inspection will consist of a general exterior examination of the ammunition items and packages for evidence of deterioration or damage and for the presence of any conditions indicating the possibility of future deterioration.

(1) If the exterior examination reveals any evidence of deterioration or nonstandard conditions, additional detailed inspections will be made as necessary to determine the condition of the entire quantity of ammunition affected. Primary emphasis is to detect any evidence of deterioration or hazardous conditions that may affect the continued serviceability or storage safety of the ammunition.

(2) Each outside site will be examined immediately following any unusual weather condition, such as severe rain, snow, or wind storms, which might damage or affect the ammunition.

c. PI will be accomplished on required stocks in outside storage at ½ the interval set by the Conventional Ammunition Inspection Interval Listing (paragraph 1-5d(21). The ½ interval will be shortened as determined by the QASAS in charge if packaging deterioration is found during performance of outside storage site quarterly inspection.

10-4 Handling, Storage, and Shipping Operations.

a. QASAS personnel will review handling, storage and shipping operations for compliance with applicable safety and operational regulations. Reports of deficiencies will be forwarded through appropriate channels to obtain corrective actions, as required. Follow-up will be made to assure deficiencies are corrected. QASAS will clear all lots of ammunition, components, and related materiel designated for shipment or issue. QASAS should work with supply personnel to assure oldest assets are issued first whenever possible.

b. Clearance will include reviewing the DSR, suspension records, and other applicable references. Local procedures will be designed to assure that all necessary actions required prior to shipment are:

(1) Noted on the appropriate shipping documents.

(2) Provided to the operating element for action.

(3) Checked to assure completion prior to release of items for issue or shipment.

(4) P-treated materiel may be shipped without restriction unless otherwise noted on the Shipping Planning Worksheet (SPW).

(5) Items palletized with black banding is not suitable for PREPO, AFLOAT/MPS/APF ships and must be replaced with galvanized banding prior to shipment. Other than new production material which requires items to be palletized with galvanized banding, older production items palletized with black banding are suitable for overseas shipment for any non-PREPO, AFLOAT application, including to non-DOD customers, provided the banding is satisfactory for its intended use and purpose. (See Appendix D, paragraph D-4 for the disposition of new Army production items received with black banding).

c. Lots and lot clusters overdue for PI will not be issued. Shipments to Post, Camp and Station locations will have a minimum of six months remaining on their inspection cycle. Ammunition lots issued to OCONUS locations and to users/installations without a QASAS must have at least 18 months remaining on the inspection cycle. Ammunition lots transferred between two OCONUS theaters or ammunition lots retrograded back to CONUS also must have 18 months remaining on the inspection cycle (exception: ammunition being retrograded back to CONUS from a Theater Support Area supply point supporting on-going combat operations must have 9 months remaining).

d. It is the responsibility of the ammunition operations organization to certify as inert/free of hazardous chemicals and/or explosives materiel being transferred directly to the DRMO. This certification will be verified IAW DOD 4160.21-M-1 through sampling by QASAS.

10-5 Transport Vehicles and Vessels.

The examinations, inspections, and reports in paragraphs a and b below must be performed by or monitored by QASAS personnel in support of the transportation officer. Of particular interest are the safety aspects of equipment and operations.

a. When transport vehicles and vessels are to be used for transportation of ammunition and explosives, they (motor vehicles, rail cars, barges, ships, aircraft, MILVANs, and CONEX/ISO containers) must be given a thorough exterior and interior examination to determine suitability to transport the materiel involved.

b. Upon receipt at a military establishment, ammunition/explosives-laden transport vehicles and vessels must be given a thorough exterior and interior examination before unloading operations are started.

(1) The examination is performed to uncover evidence of tampering or sabotage (such as broken seals, wire twists, or other security devices), missing cargo, and possibly hazardous conditions resulting from damage in transit.

(2) The condition of the lading will be observed on receipt and during unloading operations to detect damaged cargo and to determine where improper blocking, bracing, and staying methods were employed. See paragraphs 11-3c and d for reporting of deficiencies.

c. Basic policy and guidance for transportation of ammunition and explosives are contained in DTR 4500.9-R. Guidance on specific areas of interest is contained in AR 190-11, 46 CFR, 49 CFR, TM 38-250, and DA PAM 385-64.

10-6 Demilitarization.

a. Demilitarization SOP will be submitted to the Ammunition Surveillance organization for review, concurrence and approval prior to start of operation.

b. Installation surveillance organization will monitor ammunition/explosives demilitarization operations and sites.

c. The surveillance organization will develop an SOP to support demilitarization operations. The SOP will include the following information:

(1) Ammunition surveillance pre-operational checklist with the following steps:

(a) Monitor DD Form 1348-1 and/or DA Form 4508 to verify that item being demilitarized is of the proper NSN, lot, quantity, and nomenclature.

(b) Verify that the proposed method of demilitarization is compatible with current demilitarization directives.

(c) Verify the availability of approved operation SOP and that operation SOP or a dedicated surveillance SOP contains all surveillance inspection criteria.

(d) Verify the availability (at demilitarization site) of environmental permit listing conditions

and restrictions. Also, determine that demilitarization can be conducted without violation of environmental permit conditions or restrictions.

(2) Ammunition surveillance pre-inspection of demilitarization site.

(a) Verify site to be used is as authorized in SOP.

(b) Verify all safety and protective equipment required by SOP is available.

(c) Determine that all required references cited in SOP are available.

(d) Verify that a copy of the governing SOP is posted and available.

(e) Verify that all required fire and chemical hazard symbols are posted.

(f) Verify that operations are in compliance with environmental regulations as stated in the SOP.

(g) Verify that communication equipment is available and functioning properly.

(h) Determine that fire-fighting equipment is available.

(i) Verify that sensitive items are provided proper security.

(j) Confirm that operators are properly qualified and certified and licensed according to pertinent regulations.

(3) Ammunition surveillance inspection and monitoring of demilitarization operations.

(a) Verify compliance with all requirements applicable to a specific demilitarization operation.

(b) Monitor demilitarization operations using all criteria prescribed in this procedure.

(c) Examine demilitarization area (including service magazines) for compliance with explosive limits reflected in SOP, good housekeeping, and storage compatibility.

(d) Verify required personal protective equipment is used on each operation per appropriate publications.

(e) Verify compliance with all environmental requirements as stated in the SOP. Demilitarization site and operation must be in compliance with MACOM policy. This policy as stated in AMC-R 755-8 is mandatory for AMC installations and should be used as guidance by other MACOMs. Assure compliance with all Federal, local, and host-nation regulations.

NOTE

All personnel must be alert for changes in environmental conditions that could create an unsafe or unfavorable operation.

(4) Ammunition surveillance survey of demilitarization or burning site after operation.

(a) Verify on completion of each prescribed interval that scrap metal, casings, fragments, and related items are recovered from open burning and open detonation grounds and disposed of according to local SOPs.

(b) Verify after each prescribed interval in the mission SOP that a search of the surrounding area is conducted to locate and identify any unexploded ordnance. Items or material such as lumps of explosives or unfuzed ammunition may be picked up and prepared for the next detonation. Recovery and detonation of fuzed ammunition or items will be performed per local SOPs.

(c) Verify that ammunition or explosives are not left unsecured.

(d) Discrepancies noted during the survey that require immediate remedial action must be corrected prior to continuing the operation. Unresolved problems will be reported immediately to the QASAS in charge.

(5) Ammunition surveillance of demilitarization residue.

(a) Inspection will be conducted on all items of demilitarization residue produced during one work shift. Material will be offered for ammunition surveillance inspection daily.

(b) The ammunition surveillance organization will, as a minimum, perform random sampling IAW MIL STD 1916 to verify the adequacy of the demilitarization and decontamination process performed by the activity generating demilitarization residue. Results of verification inspection and sampling will be documented.

(c) Materiel generated from demilitarization to be returned to stock or offered for sale (e.g., propellant, explosives, etc.) will be inspected by a QASAS utilizing the same sampling plan as above. Functional classification and quality standards of components and materiel generated from demilitarization will be as specified by the appropriate DMWR or letter of instruction (LOI). Where classification and quality standards are not stated, data will be requested from the appropriate commodity command.

(d) All reclaimed propellant must be certified as stable for continued storage prior to re-use, return to stock, or offering for sale through Defense Reutilization and Marketing Office (DRMO) channels. Specific guidance and instructions for determining the chemical stability of propellant is contained in Chapter 13.

(6) Certification of reclaimed scrap.

(a) Scrap will be certified by the generating activity (ammunition operations organization) as being properly processed, totally inert, and free of hazardous chemicals/explosives. Mutilation will be accomplished according to existing requirements (see DOD 4160.21-M-1, AMC-R 385-100, DA PAM 385-64 and demilitarization code in the FED LOG AMDF) prior to turn-in to the DRMO.

(b) A sample of the scrap certified in (a)

above will be selected and inspected by the surveillance organization according to paragraph 10-6c(5)(b). When the inspection results determine the processed scrap to be free of hazardous material, a QASAS will verify that the certification provided by the operations organization is valid. Both the certification and verification must be documented and maintained per current regulations.

(7) Accountability.

(a) Closed loop accountability must be maintained per local regulations at demolition/burning grounds and at temporary storage sites.

(b) A certification record of demilitarized items will be prepared on a daily basis.

(8) Surveillance reporting of demilitarization operations will be performed daily according to paragraph 10-9.

10-7 Protective Clothing.

a. Suitable personal protective clothing, equipment, and devices will be used to protect against hazards inherent in specific operations, according to AMC-R 385-100, DA PAM 385-64 or other appropriate publications.

b. When conductive clothing or equipment is required in an operation, the conductive reliability of such equipment must be checked using APE 1953, conductive floor and conductive shoe tester, or other approved equipment. Utilization of APE 1953 must be according to applicable operator and maintenance manuals and must conform to local safety requirements. Daily records of results must be maintained.

10-8 Handling of Treated Packing Materiel

a. Pentachlorophenol (PENTA)-treated packing material. Personnel handling PENTA-treated packing material must wear protective clothing and follow hygiene requirements as stated in applicable DMWR, Surgeon General directives, or U.S. Army Environmental Hygiene Agency Technical Guide Number 146, entitled "Pentachlorophenal treated material handling and disposal".

b. Zinc Napthenate/Copper Napthenate-treated material. Personnel handling such material must observe precautions according to applicable DMWR or Surgeon General directives.

10-9 Documentation.

a. An internal reporting medium for all visits by QASAS personnel to operations will be established. Refer to Chapter 4 for further guidance.

b. Reports of deficiencies/operational improvements forwarded to responsible activities, and the resolution or corrective actions resulting from such reports, will be maintained. Follow-up will be made to ensure deficiencies are corrected.

10-10 Ammunition Information Notices (AIN)/Missile Information Notices (MIN).

a. AINs are used to:

(1) Disseminate advisory/guidance/restriction/technical information for JMC/SMCA managed items.

(2) Provide information relating to the conduct of the surveillance program.

(3) Disseminate new or revised inspection criteria for JMC/SMCA managed items.

(4) Disseminate new/updated ammunition shelf and service life data.

(5) Disseminate approved and/or upcoming changes to ammunition manuals.

(6) Disseminate new storage and handling requirements of specific ammunition items.

(7) Disseminate authorized use of ammunition to specific weapon systems.

(8) Retransmit Safety of Use Message (SOUM) and Ground Precautionary Action (GPA) Message.

(9) Retransmit warnings for specific ammunition items.

(10) Retransmit or clarify established ammunition policies and/or reporting requirements.

(11) Provide information on new/revised ammunition packaging/markings.

b. MINs are used to:

(1) Disseminate technical information for AMCOM managed items.

(2) Provide surveillance information regarding guided missiles and large rockets.

c. Surveillance organizations will implement guidance.

10-11 Major Training Area Operations.

a. QASAS responsibilities.

(1) QASAS assigned to live firing training areas are responsible for providing technical assistance and support on ammunition quality and explosive safety matters to locally assigned personnel and to troops training at the facility. This includes, but is not limited to, range support during training exercises and investigating and reporting malfunctions involving ammunition in accordance with AR 75-1.

(2) QASAS should be available to assist range safety officers to assure that units are properly briefed prior to commencement of training exercises. This will include as a minimum, safety in handling and transportation, protection of ammunition from the elements, malfunction reporting requirements and turn-in procedures for unused ammunition and residue (packing material, fired cartridge cases, etc.). In addition, the need to inform the QASAS of any suspect or otherwise defective ammunition that might affect user safety or mission accomplishment should also be emphasized. Examples of defective ammunition are rounds that fail to chamber, assemble or disassemble, deteriorated propellant bags, excessive misfires, short ranges, etc.

(3) QASAS must be thoroughly familiar with the requirements of AR 75-1, AR 385-63, AR 385-10,

AR 740-1, DA PAM 385-64, FM 4-30.1, local procedures, and make extensive efforts to ensure they are met.

(4) QASAS will assure that suspended or restricted munitions and ammunition lots cleared or not cleared for overhead fire are identified and appropriate action taken.

(5) Actions required and reporting procedures for malfunctions involving ammunition will be as specified in AR 75-1 and supplements thereto. Local range procedures must assure that the provisions of this regulation are met.

b. Malfunction investigations. QASAS should be available to prepare or provide assistance in preparation of reports required by AR 75-1 and local procedures. Typical examples of steps that may be taken in the event of a malfunction are listed below. It must be understood that the following is not intended to be an all-inclusive list.

(1) Obtain general information concerning the incident at the time the initial report is made. Determine if incident is reportable IAW AR 75-1 criteria.

(2) Inform reporting individual that ammunition and weapons involved in the incident must be left in place and not disturbed until an investigation has been conducted.

(3) Conduct visual inspection of malfunction site in conjunction with AMC logistics assistance representative (ACALA for weapons and AMCOM for missiles), ammunition officer and/or EOD, if needed.

(4) Visually inspect unpackaged ammunition as well as any residue from the expended ammunition. Particular attention will be given to the condition of ammunition prepared for firing, i.e., tampering or unauthorized firing configurations or procedures, exposure to elements, and length of time unpackaged.

(5) Every effort will be made to interview all personnel involved in the malfunction and other personnel who witnessed the incident. Personnel will be thoroughly questioned on events, procedures, actions, etc., that took place before, during, and after the malfunction.

(6) Ammunition will be locally suspended from use when it has been determined that the ammunition is the possible cause of a malfunction.

(7) Preliminary reports for malfunctions of conventional ammunition will be patterned after DA Form 4379, including all Army designated Class V items except guided missiles and large rockets. This includes warheads and warhead sections (when not assembled to guided missiles or large rockets) and small rockets (2.75 inch and smaller). The preliminary report will contain all applicable information requested in DA Form 4379 but will not be delayed if some of the information is not immediately available. All conventional ammunition preliminary reports will be reported by telephone if possible to Commander, U.S. Army Joint Munitions Command Operations Center (DSN793-7270/6321 or Commercial 309-782-7270/6321), Rock Island, IL 61299-6000 or by e-mail: AMC.ROCK.ORG.JMC-OPCTR-OP@MAIL.MIL with copy furnished to: AMC.ROCK.ORG.JMC-QAS-MALF@MAIL.MIL and AMC.ROCK.ORG.JMC-AMSJM-QAS@MAIL.MIL. Malfunction reports considered classified due to operational necessity will be sent to the JMC Operations Center via secure internet protocol roster network e-mail at: JMC-G3-AMMO@CONUS.ARMY.SMIL.MIL.

c. Range area operations.

(1) QASAS should conduct area inspections periodically (daily when possible) of the ranges to assure that ammunition is properly handled, stored, and transported. Particular attention will be made to safety or operational requirements such as explosive limits, rough handling of ammunition, excessive amounts of ammunition packages opened, etc. When discrepancies are noted, on-the-spot corrections will be made. Discrepancies will be recorded and reported according to locally established procedures.

(2) When visiting firing ranges the QASAS will observe firing and, if possible, consult with troops to determine if problems were encountered with the ammunition during training. Problems that are brought to the attention of the QASAS must be investigated and reported through command channels to the appropriate commodity command.

(3) QASAS monitoring range operations and unit turn-ins should assure that projectiles that are returned to ASPs which are known or suspected of having been rammed are placed in CC-H. Using units must provide positive identification of these rounds by placing a statement on the turn-in document and indelible marking on the projectiles when turning them in at the ASP.

10-12 Prepositioned Ships.

a. Army Prepositioned Ships (PREPO, AFLOAT), Marine Corps Maritime Prepositioned Ships/Landing Force Operational Reserve Material (MPS)/(LFORM) and Air Force Afloat Prepositioned Fleet (APF).

b. Introduction: Ammunition supplied for PREPO, AFLOAT, MPS/LFORM and APF is intended for long term storage aboard ship and for rapid deployment in a combat situation.

c. Criteria applicable to PREPO, AFLOAT, MPS/LFORM and APF stocks:

(1) Every effort must be given to assure lots selected will withstand shipboard environment for an extended period.

(2) When SMCA managed assets from the appropriate account are not available; resolution will be accomplished by JMC according to DOD 5160.65-M.

(3) Any supply/transportation action that frustrates or complicates inventory or surveillance procedures, contributes to delays in shipping or difficulty of handling, increases demurrage charges at the port, or increases battlefield litter during deployment should be avoided.

(4) Palletization of Ammunition:

(a) Black banding is not suitable for palletizing units on PREPO, AFLOAT/MPS/APF ships.

Galvanized steel strapping with the following specifications is required: ASTM D3953, Type 1, Heavy Duty, Finish "B" (Grade 2), Size ¾" or 1 ¼" X .035", 031" or .029", Note: brite or slit edges shall have Finish "A" overlay. The size of strapping must be as specified in applicable drawings. All banding is required to be tight.

(b) Non-4 way entry skid base units must be replaced with 4-way entry pallets. However, munitions previously palletized on serviceable 4-way entry preserved skidded bases are acceptable provided gross weight of unit does not exceed 2200 pounds.

(5) Lot integrity must be maintained by supply source and all transshipment activities. To the maximum extent possible, an entire lot must be loaded in the same conveyance(s). Quantities of one lot that can all be contained in one conveyance must not be shipped in several railcars or trucks. When multiple lots within a conveyance are necessary, each lot will be segregated.

(6) Shipper must assure 155mm projectiles are assembled in bundles of three pallets (AMC DWG 1948-4076-20PE1001). Note that the 2 galvanized, 1-¼ inch bundling straps on the pallets should pass inboard of end eyebolt lifting plugs in lieu of outboard of lifting plugs. Proper bundling significantly decreases loading/unloading time at ports and elsewhere.

(7) Ammunition storage/shipping installations are reminded to use all feasible procedures to prevent moisture contamination of ammunition and boxes during loading and shipment.

(8) Shippers should repair broken pallets/skids and loose banding at time of shipment. Having to do these repairs at the port with expensive contract labor is not cost effective.

(9) Shippers should assure all containers with air test plugs (propelling charges, 120mm, etc) have the plug in place. Over the 5 or more years munitions normally stay on board, just one round with a missing plug could cause premature deterioration in the more hostile shipboard environment, resulting in self-ignition, and potential loss of the whole ship and crew.

(10) PREPO shipments will meet European Union Commission decision in respect to non-manufactured coniferous wood packing material (NMWPM) and be certified pest-free wood. The NMWPM materials are defined as wood pallets, skids, boxes, crates, reels, and other wooden materials that have not been satisfactorily processed to kill pests present in the raw wood. Each container will be marked and certified.

d. Criteria applicable to Army PREPO, AFLOAT stock only:

(1) The Surveillance Program for PREPO, AFLOAT stocks is designed to adequately describe the current condition of ammunition and provide a basis for decisions concerning stock rotation and storage of ammunition on board ships. Surveillance functions, including sample selection and inspection, removal and replacement of suspended stocks, minor preservation and packaging (P&P), stock rotation and inventory actions are accomplished at 24 to 30 month intervals or when the ship downloads for other reasons.

(2) This program is managed by the senior QASAS at addressee reference paragraph 1-5.d.(9). All stocks being considered for Army Prepositioned ships (PREPO, AFLOAT) require a Functional Clearance from this office. Functional Clearance will be obtained from addressee in paragraph 1-5.d.(9), by submitting automated functional clearance request form located on JMC Surveillance Web at address in paragraph 1-5.d.(21)(n). Clearance must be revalidated if stocks not shipped within 360 days.

(3) Lot selection guidelines:

(a) Only Army owned ammunition of unquestionable serviceability will be loaded on PREPO, AFLOAT vessels. Lot will be selected by Army Sustainment Command (ASC), in coordination with storage installations.

(b) ASC will select lots to assure that two or more lots per DODIC are on board each, when possible. Multiple lots are needed to reduce impact of possible future suspension actions against stocks aboard the PREPO, AFLOAT fleet.

(c) MROs will use exception data to advise storage locations of specific lot numbers requested for each DODIC. Selected lots will be functionally cleared, and quantities from each lot will be specified. Do not fill the order from only one lot when more than one lot is called for. Do not substitute lots without coordination with ASC.

(d) Small lots (less than one pallet) will be avoided in the selection process, where alternatives exist. For multiple pallet shipments, round up the shipment quantity to the next full pallet if requisition quantity does not equate to full pallets.

(e) For propellant requirements see paragraph 13-17.

(f) Pre-issue inspections will be directed, as required, by addressee in paragraph 1-5.d.(9), after review of individual lot histories.

(g) Project Codes are used to identify each PREPO, AFLOAT ship. They will be MW_ with the last alpha character indicating a specific ship. Functional clearances are required for shipments with these project codes.

(4) Army PREPO shipments are configured in break bulk and strategic configured loads (SCL). See paragraph 1-5.d.(5)(f) for SCL load drawing and configurations.

e. MILVANS/ISO containers:

(1) Containers should have at least 24 months remaining on their CSC certification. It is imperative that CSC containers for PREPO, AFLOAT be inspected IAW the provision of MIL HDBK 138B even if they have current CSC certification labels. When a container fails to meet the criteria, it must be rejected for use. Inspectors should not allow any deviation for the MIL HDBK criteria.

(2) Containers loaded with ammunition and explosives must be blocked and braced tightly IAW

applicable drawings. Slack spaces normally allowed laterally (1" to 1 ½") for road and rail transport are not allowable for vessel shipment.

(3) Repship data must be forwarded by the shipper to addressee in paragraph 1-5.d.(10) and addressee in paragraph 1-5.d.(9), as well as the destination port. Weight, dimensions, number of pallets of each lot/DODIC must be listed. This information is required for final stow planning to expedite uploading of vessels.

(4) After receipt of MRO and completion of any required surveillance actions, shipping installation surveillance organization will mail, FAX or email to addressee in paragraph 1-5.d.(9) the DSR and Ammunition Data Cards (ADC).

(5) For ammo retrograded from a PREPO, AFLOAT ship, addressee in paragraph 1-5.d.(9) will forward the DSR to the storing installation.

(6) Questions pertaining to PREPO, AFLOAT stocks or shipment of PREPO, AFLOAT stocks should be addressed to addressee in paragraph 1-5.d.(9).

f. Criteria applicable to Marine Corps MPS/LFORM stock only:

(1) Lots will be picked for MPS/LFORM using the Marine Corps MPS PREFERENCE LIST. Lots do not require a functional clearance from the Army.

(2) Stocks are listed as category 1,2 or 3 with 1 being preferred, 2 being not preferred and 3 being unacceptable. Category 1 preferred stocks are the only stocks suitable for MPS/LFORM. If category 1 stocks are determined to be unsuitable, contact the Marine Corps liaison. (See paragraph 1-5.d.(11)).

(3) Only the best Marine Corps assets are to be shipped for MPS/LFORM.

(4) Unless exception data on the MRO designates a particular lot, no less than 2 and no more than 5 lots per DODIC per ship will be selected. Lots with a "Y" designator will not be used.

(5) Lots with a normal current inspection will not require a pre-issue inspection.

(6) MPS/LFORM requests can be identified by project code MEA, MEB, MEC, OR 830 on the Ammunition Shipment Planning Worksheet (ASPW) sometimes called (SPW).

(7) After receipt of MRO and completion of any required surveillance actions shipping installation surveillance organization will mail DSR and ADC of accepted lots to addressee in paragraph 1-5.d.(10).

(8) Fallbrook is responsible for ensuring that ADC and DSR's are forwarded to installations receiving retrograded ammo.

(9) Questions pertaining to MPS/LFORM should be addressed to the local Marine Corps liaison. In the absence of a local liaison, contact the addressee in paragraph 1-5.d.(11).

g. Criteria applicable to Air Force APF stock only (IAW T.O. 11A-1-10):

(1) Only condition code "A" stocks will be shipped to, or placed on APF vessels unless otherwise permitted by the APF Program Superintendent. Only conditions code "A" assets with at least six years shelf/service life remaining (to the greatest extent possible) will be shipped to support APF operations.

(2) Air Force APF stocks do not require an Army functional clearance and there is no requirement to request clearance from the Air Force.

(3) Only full unit packs will be shipped. Light boxes will not be shipped.

(4) A periodic Inspection (PI) will be performed immediately prior to shipment of lots selected for APF even if this entails performing multiple PI's at the same location within a short period of time. Questions concerning Air Force APF should be addressed to the addressee in paragraph 1-5.d.(12).

10-13 Water Port Operations.

a. QASAS assigned to water ports will act as advisor to the senior Department of Defense official operating the port and its support facilities (Military Traffic Management Command Detachment, Transportation Terminal Unit, Port Supply Activity, etc.).

b. Advice and planning support will be provided in the areas of explosives safety (site planning in accordance with quantity distance requirements, compatibility of ammunition and other cargo, etc.), ammunition handling procedures and techniques, preparation of hazardous cargo documents and repair/evaluation of damaged ammunition items/packages.

c. Pier and ship operations will be monitored to assure proper equipment and procedures are used in the handling, movement, lifting and securement of ammunition and explosives and that proper fire fighting precautions have been taken. At all operating locations, to include supporting marshalling areas, assure explosive weight limits are not exceeded and that pier and shipboard personnel observe common precautions for personnel handling or operating in the vicinity of ammunition and explosives.

d. Coordination with U.S. Coast Guard elements is essential for effective implementation of guidance.

e. Also see paragraph 10-5.

10-14 Quantity Distance determinations.

QASAS can assist the organization safety office in preparation of site plans, waivers and storage licenses. Detailed information in this area is in AR 385-10/DA PAM 385-64.

10-15 War Reserves Stocks for Allies (WRSA) Programs.

a. QASAS assigned to water ports will act as advisor U.S owned forward positioned ammunition stocks for support of WRSA is intended for long term storage in an austere environment. This program is managed by the Army Sustainment Command (ASC). Any deviations from the requirements of SB 742-1 will be granted by the ASC in coordination with the EUCOM J4 Munitions Officer and applicable services headquarters. In the case of Army stocks, this is the

HQDA, DCS, G4, Munitions Office.

b. Criteria applicable to WRSA stocks:

(1) All stocks being considered for WRSA require a Functional Clearance from ASC. Functional Clearance will be obtained by submitting automated functional clearance request form located on JMC Surveillance Web at address in paragraph 1-5.d.(21)(n). Clearance must be revalidated if stocks are not shipped within 360 days.

(2) Stocks offered for WRSA shipments will meet ISPM-15 requirements (as applicable). Check with EUCOM ECJ4 in regards to compliance with ISPM 15/DoD pest-free certification.

(3) Lots do not need to meet FMS quality standards. However, stocks must be CC-A, suitable to issue to US Troops.

(4) Every effort must be given to assure lots selected will withstand an austere environment for an extended period.

(5) When SMCA managed assets from the appropriate account are not available; resolution will be accomplished by JMC according to DOD 5160.65-M.

(6) Lot selection guidelines:

(a) Only ammunition of unquestioned serviceability and the best available will be selected for WRSA. Lot will be selected by Army Sustainment Command (ASC), in coordination with HQ, JMC; HQ, AMCOM; and JMC storage installations.

(b) Lots will be the largest size possible.

(c) Small lots (less than one pallet) will be avoided in the selection process, where alternatives exist. For multiple pallet shipments, round up the shipment quantity to the next full pallet if requisition quantity does not equate to full pallets.

ASC will select lots to assure that two or more lots per DODIC are included in each shipment. An exception can be granted on a case-by-case basis.

(d) MROs will use exception data to advise storage locations of specific lot numbers requested for each DODIC. Selected lots will be functionally cleared, and quantities from each lot will be specified. Do not fill the order from only one lot when more than one lot is called for. Do not substitute lots without coordination with ASC.

(e) For propellant requirements see paragraph 13-17.

(f) Pre-issue inspections will be directed, as required, by ASC, after review of individual lot histories. Lots that have not been inspected within the past 12 months or are of questionable serviceability will have a PII prior to shipment.

(7) Any supply/transportation action that frustrates or complicates inventory or surveillance procedures, contributes to delays in shipping or difficulty of handling, increases demurrage charges at the port, or increases battlefield litter during deployment should be avoided.

(8) Palletization of Ammunition:

(a) Black banding is not suitable for palletizing units for WRSA. Galvanized steel strapping with the following specifications is required: ASTM D3953, Type 1, Heavy Duty, Finish "B" (Grade 2), Size ¾" or 1 ¼" X .035", 031" or .029", Note: brite or slit edges shall have Finish "A" overlay. The size of strapping must be as specified in applicable drawings. All banding is required to be tight.

(b) Non-4 way entry skid base units must be replaced with 4-way entry pallets. However, munitions previously palletized on serviceable 4-way entry preserved skidded bases are acceptable provided gross weight of unit does not exceed 2200 pounds.

(c) Lot integrity must be maintained by supply source and all transshipment activities. To the maximum extent possible, an entire lot quantity must be loaded in the same conveyance(s). When multiple lots within a conveyance are necessary, each lot will be segregated or clearly identified as distinct lots in the transport unit, i.e. engineer tape, placard boards, etc.

(9) Shipper must assure 155mm projectiles are assembled in bundles of three pallets (AMC DWG 1948-4076-20PE1001). Note that the 2 galvanized, 1-¼ inch bundling straps on the pallets should pass inboard of end eyebolt lifting plugs in lieu of outboard of lifting plugs. Proper bundling significantly decreases loading/unloading time at ports and elsewhere.

(10) Ammunition storage/shipping installations are reminded to use all feasible procedures to prevent moisture contamination of ammunition and boxes during loading and shipment.

(11) Shippers will repair broken pallets/skids and loose banding at time of shipment.

(12) Shippers should assure all containers with air test plugs (propelling charges, 120mm, etc) have the plug in place.

c. MILVANS/ISO containers:

(1) It is imperative that CSC containers for WRSA be inspected IAW the provision of MIL HDBK 138B even if they have current CSC certification labels. When a container fails to meet the criteria, it must be rejected for use.

(2) Containers loaded with ammunition and explosives must be blocked and braced tightly IAW applicable drawings. Slack spaces normally allowed laterally (1" to 1 ½") for road and rail transport are not allowable for vessel shipment.

(3) Questions pertaining to WRSA stocks should be addressed to addressee in paragraph 1-5.d.(9).

CHAPTER 11.
RECORDS AND REPORTS

11-1. Technical History.

a. The technical history of each lot, serial, or group is maintained by the surveillance organization indicating the results of each inspection, test, investigation, and any unusual or changing condition affecting the ammunition. The technical history of materiel is an important record used in evaluating the serviceability and reliability of ammunition items, and it is important that all data recorded for inspections, tests, and investigations be accurate and concise.

b. The type of information required for recording and reporting is dependent on the type of information required by the organizations supported by surveillance, i.e., supply, maintenance, and stockpile reliability organizations.

(1) The information required for supply purposes is determined by local procedures for satisfying local and higher headquarters supply actions.

(2) The information required for maintenance purposes normally is more detailed on the extent of deficiencies and work required to return the item to an issuable condition.

c. The type of information required to evaluate the reliability of the stockpile includes condition of materiel, quantity, date of manufacture, type of storage, type of defects, assignable cause of defects, results of tests, etc.

d. Additionally, the surveillance organization is required to submit various other types of reports on materiel received or in storage and to maintain certain specified records.

e. Forms required by this chapter are available at the 'Official Department of the Army Publications and Forms' website referenced in paragraph 1-5.d.(21)(b).

11-2. Records.

a. Depot Surveillance Record (DSR).

(1) DSR will be prepared and maintained in an up-to-date status for each lot, serial, or group of ammunition in storage (for exceptions, see paragraph (6) below). DSR is used by all organizations that store ammunition or explosives at any level above the user level (such as depots, direct and general support units, ammunition supply points, etc.). DSR contains information on the technical history of the materiel such as the results of each investigation, examination, test, any unusual or changing condition affecting the ammunition, type of storage, etc.

(a) Surveillance organizations with access to the Munitions History Program (MHP) will use the automated MHP feature of that system.

(b) Surveillance organizations without MHP access but with computer capability should automate DSR information using the procedures detailed in Appendix B.

(c) Organizations operating on an automated DSR system will not continue to maintain a printed "hard copy" system.

(2) All DSR data fields will be used unless the QASAS in charge determines that a certain data field is not applicable at a particular location. It is the responsibility of the QASAS performing the last inspection to assure that all data fields in use contain accurate and up to date information.

(3) The recorded inspection remark will contain:

(a) Date of inspection.

(b) Type of inspection accomplished.

(c) Condition code.

(d) Number of samples.

(e) Inspection reference(s).

(f) Approximate quantity. Quantity is for information only, is not intended as a stock record requirement, and will not be used if prohibited by a security classification. Quantity will be only that of individual lot, not entire cluster quantity.

(g) Type of storage.

(h) A brief and accurate description of conditions encountered to include packaging unitization information, type banding, etc. The DSR for each lot in a cluster will be annotated with inspection results of the sampled lot. Remarks will include the defect codes that best identify the defects observed during the inspection. Defect codes are identified in DA PAM 700-19 and Appendix AB and Appendix AC.

(i) Statement of actions taken and assignment of condition code.

(j) Status of missile alteration or MWO (if applicable).

(k) Pertinent reference to documents other than normal inspection references such as ACRs, memoranda of disposition, etc.

(l) QASAS identification. The completed inspection will reflect the name (typed or printed) of the QASAS who conducted the inspection who will normally review the entry for accuracy.

(m) The latest entry should be compared with previous inspection results given on the DSR for possible findings that may require additional action. The Chief of Surveillance or first line supervisor should periodically monitor these remarks to assure that they are accurate and complete.

(4) DSRs for missile materiel will normally be prepared for each lot or serial number item. Refer to Chapter 6 for specific guidance on inspection by lot, serial number, or group number. DSRs will be maintained accordingly.

(5) DA Form 3022-R may be reproduced locally as required on 8 by 10-inch card stock (image size 7 by 9½-inch) to permit folding the card in the middle to an 8 by 5 inch size for filing. Installations that have automated DSRs are required to have a capability for printing DSRs.

(6) Exceptions from the requirement to prepare and maintain DSRs:

(a) CCFTP test samples held at the test site.

(b) Army ammunition plants need not prepare DSRs for new materiel in the industrial account, provided no significant events necessitating a DSR entry (such as suspensions, restrictions, releases, special inspections or conditions code changes) occur. Processed industrial stocks, which have not yet "been accepted" by the government, will have DSRs initiated as specified by appropriate regulatory requirements. For materiel identified as "work in process," logbooks containing pertinent information may be used in lieu of DSRs. If lots are shipped prior to initiation of DSRs, shipping documents will be annotated with a statement that DSRs have not been initiated; reference this paragraph.

(c) Basic load munitions, see paragraph 8-1c.

(7) DA Form 3022-R may be reproduced locally, as required, on 8½ by 11-inch paper for use as an ammunition surveillance inspection worksheet (i.e., used to temporarily record inspection data for transposition to the formal DSR).

b. Ammunition suspension record. Ammunition suspected of being unsafe or containing a critical defect will be suspended to prohibit its issue and use. This action is based on malfunction or accident reports, function test reports, and inspection reports. An investigation is conducted to ascertain the quality of the lot or item and to determine disposition of quantities involved. Based on the results of the investigation, disposition instructions will be issued to release, rework, or demilitarize the ammunition under consideration.

(1) Army suspension. Worldwide ammunition suspension, restriction, and release notices are disseminated by JMC and AMCOM teletype or electronic mail supplements to TB 9-1300-385.

(2) Other service suspensions are covered in CMRS (Air Force) and NAVSUP P 801 (Navy/USMC).

(3) In accordance with SMCA guidelines, a temporary suspension issued by the Army, Navy/USMC or Air Force applies to all stocks regardless of owner. If a service does not agree with the temporary suspension it will release its stocks; that release applies only to that service's stocks. A permanent suspension issued by the Army, Navy/USMC or Air Force applies only to stocks of the service issuing the permanent suspension. Permanent suspensions issued by any service will apply to stocks in the demilitarization accounts unless JMC surveillance non-concurs in the suspension action.

(4) Suspension control. Control of suspended stocks is a responsibility of the ammunition surveillance organization and involves maintaining the installation's master suspension records. The ammunition surveillance organization is also responsible for assuring that suspended items that are restricted from handling or movement are not moved, handled, or shipped except as specifically authorized by higher headquarters. Munitions locally issued for training must be monitored for suspensions. Suspension notices received during non-duty hours at installations where non-duty hour training exercises are conducted must be checked against munitions in use for such exercises.

(a) Suspended stocks in storage must be appropriately identified using DD Form 1575 (Suspended Tag-Materiel) or DD Form 1575-1 (Suspended Label-Materiel) to preclude unauthorized handling or issue.

(b) In addition to applicable information as requested on the form, the tag will be annotated with one of the following remarks as applicable:

"Suspended-- Issue Prohibited."

"Suspended from Issue, Movement, and Use."

"Suspended Except for Emergency Combat Use."

(c) Lettering will be the largest possible that is compatible with the forms. OCONUS commands may fabricate and use multilingual versions of forms as needed.

(d) Forms will be securely attached to the affected lot's stack in storage and to the magazine data card to preclude loss during magazine storage operations, etc. Presence of suspension tags will be verified during each magazine inspection.

c. Ammunition gage record card. DA Form 3023 (Gage Record) is received with each gage and includes pertinent gage information. The card will be maintained in an up-to-date manner with the record of actual gage usage recorded on the reverse side. The gage usage record is used to determine when gages should be submitted for a dimensional check. Gage record cards are returned with gages requiring use-test checks.

d. DD Form 1650 (Ammunition Data Card). When ammunition is renovated, inspected 100 percent for critical defects, modified or regrouped, new or revised Ammunition Data Cards (ADC) will be prepared by the appropriate ammunition operations organization and approved by the applicable quality organization. The requirement for new ADCs is outlined in MIL-STD-1168 and specific instructions from the commodity command. Revised data cards will be forwarded to addressee in paragraph 1-5.d.(20)(c) utilizing MHP; for other services see paragraphs 11-4.

e. Equipment logbooks and maintenance logs. The results of inspection and maintenance of missiles and associated test and handling equipment will be maintained on applicable forms according to DA Pam 750-8.

f. Storage monitoring record. Results of the SMI monitoring and action taken to correct any discrepancies will be posted to the DSR. Storage Monitoring inspection of toxic chemical munitions may be recorded on a locally devised form (manual or automated) for each ammunition lot or serially numbered item subjected to SMI. Records indicating that SMIs have been accomplished are part of the historical record and will be retained indefinitely. When SMIs reflect nonstandard conditions (e.g., evidence of leakage, damaged outer pack or container,

dunnage, etc.) the results of the inspection and the actions taken to resolve discrepancies will be posted to the DSR.

g. DA Form 4508 (Ammunition Transfer Record). DA Form 4508 will be used to accomplish local condition code, NSN, nomenclature, and lot or SN changes and will be processed through and concurred in by the ammunition surveillance organization. QASAS must review and approve any reclassification action.

h. Materiel condition tags and labels.

(1) All materiel destined for Navy or Marine Corps use will have materiel condition tags or labels affixed prior to shipment.

(2) Tags or labels will be used to identify suspended stocks, as required by paragraph 11-2b(4)(a) above, and to identify containerized chemical surety munitions.

i. Lot Cluster logs.

(1) A log will be maintained for each cluster that identifies all lots belonging to the cluster.

(a) Figure 11-1 contains an example format and describes minimum data elements required for creating a local log. A master log will be maintained to identify all lot clusters. Figure 11-2 contains an example format and guidance on development of the master log. Local reproduction of Figures 11-1 and 11-2 is authorized.

(b) The surveillance test lot (STL) reporting system of the Standard Depot System (SDS) or a PC-based data base system using data elements from Figures 11-1 and 11-2 meet the requirements for lot cluster logs.

11-3. Reports.

a. DA Form 2415 (Ammunition Condition Report). The ACR is used to report failures, discrepancies, and other conditions of ammunition materiel. The instructions for use, completion, and distribution of DA Form 2415 are outlined in DA Pam 750-8.

b. SF 368 (Product Quality Deficiency Report). SF 368 (PQDR) is the authorized means for users of Army materiel to report:

(1) Equipment faults in design, operations, and manufacturing.

(2) Equipment improvement recommendation to suggest improvements in Army materiel.

(3) Unsatisfactory new equipment received that is a direct result of below standard quality or workmanship.

(4) PQDRs for Army owned or managed ammunition will be reported IAW AR 702-7 utilizing the Joint Services Website referenced in paragraph 1-5.d.(21)(c).

c. SF 364 Report of Discrepancy (ROD). Installations receiving shipments with damage due to improper unitization, packaging, preservation; and with incorrect marking, quantity discrepancies or documentation discrepancies will report the discrepancies according to AR 735-11-2. SF 364 will not be used for reporting transportation discrepancies (see DD361 below), except for materiel sent parcel post. The QA organization will normally report packaging discrepancies while the operations organization reports discrepancies in the item(s) shipped.

d. DD 361 Transportation Discrepancy Report (TDR). Shipments received at an installation that are astray, lost, or damaged; improperly blocked and braced; incompatible; handled improperly by carrier; tender or use of carrier's inadequate equipment or facilities; misdirected shipments; improper documents; or shipped in violation of military regulation will be reported on DD361 according to DOD 4500.9R.

e. Ammunition inspection and lot number report. This report will be prepared according to AR 700-19 and DA PAM 700-19 (WARS) for those commodities under the control of JMC and AMCOM managed commodities. The preparation of required input data will be accomplished by or under the supervision of a QASAS.

f. The Small Arms Ammunition Trace Test Record will be used for recording and reporting the trace test results according to SB 742-1305-94-20.

g. Reports of explosions, chemical agent releases, and serious accidents will be reported in accordance with AR 385-10 and applicable supplements.

h. DD Form 250 (Materiel Inspection and Receiving Report).

(1) The instructions and procedures for the preparation and distribution of DD Form 250, initiated in connection with shipment of supplies from vendor's plants (new procurement), are specified in DOD acquisition regulations. The requirement for inspection and/or acceptance of materiel (new procurement) received at depots from vendors as indicated on DD Form 250 is applicable to:

(a) Materiel inspected at origin and requiring acceptance at destination.

(b) Materiel requiring inspection and acceptance at destination.

(2) Installations receiving materiel from procurement for stock will process the DD Form 250 in accordance with applicable regulation (1) above.

(3) The SF 368 will be used to report defective products received at army installations for acceptance by the Government. In block 22 of SF 368, reference that this is a "Memorandum of Rejection" should be included.

11-4. Distribution of DSRs and ADCs to Army Activities.

DSRs and ADCs are important documents for activities that store, ship, receive, or issue ammunition. Missing DSRs and ADCs may frustrate ammunition logistic operations and necessitate the performance of unnecessary inspections. The ammunition shipper will assure DSRs and ADCs are available to the receiving activity. DSRs need not be forwarded to the receiving activity if MHP is available to both, shipper and receiver. If MHP is not available to

either shipper or receiver, DSR will be transmitted by fax or email. Forwarding by mail or with the shipment should only be accomplished when either shipping or receiving activity does not have fax or email capability. ADCs are available on the Internet at the web addresses listed in paragraph 1-5.d.(21)(h) or 1-5.d.(21)(j). If ADC is not available electronically, receiving activity will contact shipping activity and request hard copy of ADC. Installations should utilize electronic capabilities to the maximum.

11-5. Distribution of DSRs and ADCs to Other Than Army Activities.

a. For all U.S. Navy and Marine Corps shipments, one copy of the ADC and DSR for each lot or serial numbered item of ammunition will be forwarded to the consignee utilizing DA Form 200. Distribution for U.S. Air Force shipments will be according to TO 11-A-1-10, which specifies that surveillance records will be both mailed and sent with the ammunition shipment. Additional distribution will be made as follows:

b. For materiel furnished the U.S. Air Force, send one copy of ADC and DSR to addressee in paragraph 1-5.d.(13).

c. For NAVSEA, NAVAIR, and USMC shipments, forward the ADC and DSR to the consignee and one copy of each to the addressee in paragraph 1-5.d.(14).

d. Data cards for specific lots need to be sent only once to each service central repository. Subsequent shipments of the same lot do not require report submissions of the same data card to the same repository.

e. DSR will not be provided to foreign military sales or security assistance customers. ADCs will be provided to these customers. Refer to paragraph 12-6.c. and 12-6.d. for further information.

11-6. Reporting of Offshore Procured Ammunition.

a. There is ammunition in or entering the U.S. Army Inventory that was manufactured in foreign countries. This ammunition is commonly called "off-shore procured ammunition" and may or may not have restrictions on its use by U.S. Forces.

b. If during inspection it is determined that the ammunition is off-shore procured and there is a question as to the authorization for issue and use by U.S. Forces, the lot must be reported to the appropriate commodity command, regardless of quantity. Data reported will include nomenclature, NSN, lot number, pack, manufacturer markings, and details. Data will be sent as appropriate to the addressees in paragraph 1-5.d.(1) and (2). Ammunition for which there is no question as to the authority for existence in the stockpile for use by U.S. Forces will have the appropriate condition code assigned based on inspection and test conducted according to this publication.

c. Lots that are questionable will be assigned a non-issuable condition code pending receipt of instructions from the commodity command.

Figure 11-1
AMMUNITION LOT CLUSTER LOG

INDEX # _____ CC:_____

ITEM DESCRIPTION:_____

LOT NUMBER	SAMPLED	DATE

1. INDEX #: A sequential number followed by the Department of Defense Identification Code (DODIC) (e.g. 001-A071). Each sequence number will be unique and will not be reused. If the items to be clustered do not have an assigned DODIC, the installation will assign a local DODIC for this purpose.

2. CC: Enter the condition code for the lot cluster.

3. ITEM DESCRIPTION: Enter the nomenclature of the item clustered.

4. LOT NUMBER: Enter the complete lot number of each lot in the cluster (e.g., IOP91F012-024).

5. SAMPLED: Enter an X in this column if the lot has been used as the lot cluster sample; otherwise leave blank.

6. DATE: Enter the date the lot was used as a lot cluster sample; otherwise leave blank.

Figure 11-2
LOT CLUSTER MASTER LOG

INDEX #	DATE	# LOTS	CC

1. INDEX #: Enter the Index number as defined in Figure 11-1.
2. DATE: Enter the date the Lot Cluster was established.
3. # LOTS: Enter the number of lots in this cluster
4. CC: Enter the condition code of the cluster.

CHAPTER 12.
SECURITY ASSISTANCE PROGRAM

12-1. General, Foreign Military Sales, Grant Aid, and Presidential Draw down.

a. The requirements in this chapter are applicable to Security Assistance Program such as Foreign Military Sales (FMS) shipments Grant Aid (GRA), and Presidential Draw down. These requirements are not intended to conflict with those of other DA publications.

b. Only materiel (the item and packing i.e. intermediate, inner, and outer packs) that reflects favorably on the United States and meets the quality requirements as specified in this chapter will be supplied to foreign governments unless otherwise authorized by negotiated agreement. Inspection and clearance criteria for Presidential Draw down shipments will be the same as those for Grant Aid (GRA) shipments. Materiel will be tested and quality checked to the same degree as that supplied to the U.S. Army.

c. Materiel selected for the SAP will be from the best available stocks and will be of unquestionable serviceability. Packaging will have no extraneous markings that might cause the identity or serviceability of the contents to be questioned. Only exceptions are for shipments requested, "As is". All munitions will also meet the requirements prescribed by the technical publication(s) for the item concerned.

d. SMCA managed Army materiel will not be cleared for shipment by the quality organization or released by the consignor until clearance for functional suitability is obtained. Installations will not release SMCA managed materiel that does not meet prescribed specifications without written authority from the SMCA.

e. Materiel accepted on waiver at the time of acceptance, renovation, modification, etc., due to deviations from specifications or drawings affecting safety, reliability, interchangeability, or specified performance characteristics is not suitable unless the customer has been apprised of the nature and extent of the deviation and agrees to accept the materiel. Similarly, customer approval is required for any other deviation from the requirements specified in this chapter. Installations will not release such materiel until written authority has been obtained from the appropriate commodity command. The commodity command will not provide written authority to the shipper until the customer has been fully informed of materiel characteristics and has agreed to accept the materiel.

f. Items in long supply and excess (MIMEX) materiel is furnished in "as is" condition with the recipient government waiving the right to submit claims against the U.S. Government through the Department of Defense (DOD) discrepancy report system. The Letter of Offer and Acceptance (LOA) defines in general terms the condition constituting "as is" and states that preservation and packaging will be the minimum for safety and to reduce further deterioration during shipment. Markings will comply with Department of Transportation (DOT) and United Nations Organization (UNO) requirements. Unless otherwise stated, the lack of a current inspection, trace test, function test, deterioration check test, or reassessment of materiel is not cause to disqualify a lot from shipment. A functional clearance is not required for MIMEX.

g. Additional inspection requirements or instructions for specific materiel may be provided by the appropriate commodity command on an "as required" basis for selected shipments.

12-2. Clearance Procedures.

a. SMCA managed Army materiel.

(1) A clearance for functional suitability will be obtained from addressee in paragraph 1-5.d.(1). Functional clearance will be obtained by submitting automated Functional Clearance Request Form located on JMC Surveillance Web Page at address in paragraph 1-5.d.(21)(n). The following information is required for clearance of candidate materiel, any information that is not received or is illegible will slow the process for clearance and the requestor will be contacted to provide the data:

(a) Requestor name and phone number.

(b) Country and case (LOA) designator.

(c) Nomenclature, NSN and DODIC.

(d) Materiel Release Order (MRO) number (FMS requisition/document number).

(e) Lot or serial number and quantity to be shipped assigned to each MRO by MRO suffix.

(f) Date of manufacture and latest test date (if applicable).

(g) Functional deviations or waivers from local records.

(h) Restrictions or suspensions.

(i) Identify whether or not outer pack is P-treated.

(j) Issuing facility.

(2) Materiel not shipped within 360 days from date of functional clearance must have functional clearance updated by SMCA.

(3) Materiel not shipped within 360 days from date of FMS inspection will be reevaluated by the ammunition surveillance organization for continued suitability for FMS. Reevaluation should take into consideration type of storage and results of the last inspection or test. Reinspection need not be made unless the QASAS in charge deems it necessary to assure that the materiel meets the requirements of this supply bulletin.

(4) When an MRO is denied by the designated shipper, a detailed description of the conditions warranting the denial will be furnished SMCA upon request.

b. AMCOM, Air Force, Navy, Marine Corps managed/owned materiel and inert items do not require a clearance for functional suitability from the SMCA IAW this manual. Functional clearance requirements will be specified by the owning service.

TB 9-1300-385 will be queried to ensure proper condition code. AMCOM inquiries may be made to addressee in paragraph 1-5.d.(2).

12-3. Inspection Criteria.

a. SMCA managed Army materiel. Sample size (Table 12-1) and criteria as outlined in paragraphs 12-4a and 12-5a will be used to determine the acceptability for FMS shipments and for the outer pack for Grant Aid (GRA). Classification of defects will be according to Chapter 2 and acceptance criteria for defectives will be according to Table 12-1.

b. AMCOM managed materiel.

(1) The sample size, defect classification and rejection criteria are contained in the applicable technical manual, supply bulletin, or other procedural documents.

(2) Pressurized and desiccated containers shall be 100-percent inspected prior to release for shipment to ensure that they have adequate internal pressure and a satisfactory internal relative humidity as specified in the applicable technical manual.

12-4. Materiel Acceptability Criteria.

a. SMCA managed materiel.

(1) Small arms tracer ammunition selected for FMS will have a specification trace of 80 percent or greater. Absence of test data will not disqualify a lot from shipment.

(2) Materiel selected for GRA will be CC-A quality and comply with issue requirements for the U.S. Army.

(3) Munitions accepted without waiver of functional deficiencies at an Army Ammunition Plant (AAP) may be considered suitable for issue under FMS provided:

(a) Materiel has had an acceptance inspection (AI) or initial receipt inspection (IRI) encompassing criteria found in Chapter 2 and paragraphs 12-4 and 12-5 of this chapter.

(b) Lots are in CC-A.

(c) Containers have original manufacturer's seals.

(d) Lots will be shipped before interval of 360 days from date of AI or IRI and functional clearance.

(e) Functional clearance is requested and received from SMCA.

(f) Should shipment occur after 360 days from date of AI or IRI, normal FMS inspection procedures will be applied.

(4) Materiel selected for FMS or GRA will be afforded preservation and packaging level A/B except for parcel post and air shipment for which level B/B is authorized as stated in AR 700-15. Guidance for less than level A/B packaging and preservation will be contained in the requisition and annotated on the MRO as exception data.

(5) Ammunition with the following conditions will not be released by the QA organization without written authorization from SMCA. Materiel that does not meet the prescribed standards will be reported by the installation to addressee in paragraph 1-5.d.(20)(f) for waiver of deviation consideration and customer acceptance. Where applicable, detailed deficiencies and rework requirements (preservation, packaging, and maintenance) to include estimated cost(s) will be provided.

(a) Restricted from issue or use for any reason.

(b) Accepted at time of manufacture or renovation under a waiver that affects safety, reliability, interchangeability, specified performance characteristics, or maintainability.

(c) Appearance of the item or its related packing undesirable in that it could cause an unfavorable reaction from the customer.

(d) Preservation and packaging level is less than that prescribed by AR 700-15 based upon item, package configuration, shipment mode, and handling conditions, and storage conditions.

(6) Bulk propellant, propelling component charges and ammunition components.

(a) Bulk propellant and component charges. Materiel selected for FMS shipment will have a minimum of one year remaining on the Loading Authorization (as specified at APP I, TB 9-1300-385) at the time of shipment unless otherwise authorized by SMCA.

(b) Ammunition components (such as primers, ignition cartridges, or delay elements) selected for FMS shipments will have a minimum of 1 year remaining on the deterioration check test interval unless otherwise authorized by addressee in paragraph 1-5.d.(1).

(c) Materiel selected for GRA shipments will be CC-A quality and comply with those issue requirements for the U.S. Army.

(7) High explosive (HE) and white phosphorous (WP) fixed and semi-fixed ammunition, mortar ammunition, separate loading projectiles, and separate loading propelling charges with less than 100 rounds per lot will not be issued for GRA or FMS shipments unless specifically authorized in the LOA, DD Form 1513 (U.S. DOD Offer and Acceptance) or the quantity requisitioned is less than 100 rounds.

(8) Tag end lots of ammunition and specifically a lot for which the quantity remaining is less than a standard pack will not be utilized for GRA or FMS unless authorized in the LOA, or the quantity required is less than one standard pack.

b. AMCOM managed materiel.

(1) All materiel selected for shipment under the FMS will be subjected to a pre-issue inspection prior to release for shipment. This inspection will be performed according to the applicable ammunition surveillance procedure and technical manuals.

(2) All outstanding URGENT Department of the Army Modification Work Orders (DAMWO) must be applied to materiel selected for FMS shipment prior to the required pre-issue inspection.

(3) All other DAMWOs should be applied to materiel selected for FMS shipments prior to the required pre-issue inspection. Exceptions to this criteria, which must have prior approval from AMCOM, are as follows:

(a) Modifications developed for limited geographical application that is not required by the recipient.

(b) Modifications that are not available and application would delay the scheduled shipment release date.

(4) Missiles, rockets, and related separately packaged components selected for shipment to FMS customers must have at least 50 percent or 4 years, whichever is less, of the established shelf life remaining at the time the shipment is released to the carrier at the point of origin. Materiel selected for shipment to GRA customers must have at least 2 years of the established shelf life remaining at the time the shipment is released to the carrier at the point of origin.

12-5. Special Instructions.

a. SMCA managed materiel.

(1) Renovated or reworked ammunition.

(a) Ammunition renovated or reworked will be repackaged according to the applicable drawing for the item concerned.

(b) Ammunition previously renovated or reworked and meeting the requirements of this bulletin will be considered suitable for GRA or FMS.

(c) Ammunition that is renovated or reworked to fill a GRA or FMS requirement must meet the requirements of this bulletin.

(d) Ammunition requiring a post renovation test will be tested prior to release for shipment.

(2) Marking defects.

(a) Marking defects that do not exceed the limits established by the inspection criteria of this supply bulletin are acceptable.

(b) Address marking will be applied according to the latest revision of MIL-STD-129, AR 725-50, and special instructions as may be furnished by the Security Assistance case manager.

(c) Lots of ammunition marked with an Ammunition Identification Code (AIC) or Federal Stock Number (FSN) in place of the National Stock Number (NSN) and Department of Defense Identification Code (DODIC) are acceptable. The DD Form 1348-1 (DOD Single Line Item Release/Receipt Document) and document accompanying the shipment must either reflect the AIC, the FSN and DODIC, or the correct NSN and DODIC. If the ammunition requires reworking, the correct NSN-DODIC will be applied according to applicable drawings.

(d) Weapon model designation on boxes need not be corrected to comply with drawing requirements unless containers required reworking at which time weapon designation will be applied according to applicable drawings.

(e) Changing the nomenclature from "shell" to "cartridge on the round, container, or box is not required unless the round, container, or box requires reworking. Items containing both nomenclatures within a lot (such as cartridges on boxes and fiber containers, and shell on round) are acceptable.

(f) Light boxes (less than a standard pack) will be marked IAW drawing 8796522.

(g) When obliteration is done during processing through maintenance, packing or renovation facilities, the entire side, top, or end will be completely painted with sufficient coverage to effectively prevent "bleeding through" of previously applied markings.

(h) The color of the obliterating paint, or lacquer used will match as closely as possible the color of the boxes or containers. Care will be exercised when obliterating and remarking cleats of boxes to ensure that the color of the paint, size of lettering, and position of stenciling will clearly identify the contents and not cause misinterpretation of applicable color markings for practice, smoke, or chemical ammunition.

(i) Remarking will be according to the packing and marking drawing for the item concerned.

(j) When impressed marking is obliterated, the new marking will be stenciled on the opposite side of the box. Destination marking will be stenciled on the obliterated impressed marking side of the box. Boxes previously stenciled over the obliterated impressed marking are acceptable if the stenciling is legible and the obliteration was accomplished over the entire panel of the box.

(k) Obliteration, when required, must be consistent throughout a lot (such as same color or paint, enamel, or lacquer; uniform coverage; and uniform lettering).

(l) Obliterated impressed marking on metal components due to changes in production or modification is acceptable if covered by X punch or knurling. When X punch or knurling is not feasible due to hardness of metal or possibility of component deformation, the ORD markings may be obliterated with black paint or lacquer. Obliteration will be applied neatly. New markings will be applied by stamping or stenciling as appropriate. Recipient will be advised that items have been remarked to comply with the proper nomenclature and that serviceability and reliability are not affected.

(m) The following specifications are for the paint and stencil ink authorized for obliteration and remarking of materiel required for GRA and FMS:

MIL-P-52108(MR), water emulsion paint for stenciling and obliteration.

A-A-208, Type I, opaque stencil marking ink for nonporous surfaces.

A-A-208, Type II, opaque stencil marking ink for porous surfaces.

A-A-208, Type III, opaque stencil marking ink for both porous and nonporous surfaces (applied by a pressurized container).

A-A-208, Type IV, opaque stencil marking ink for both porous and nonporous surfaces (applied by a stencil roller).

(n) Marking obliteration should be done according to the current MIL-STD-129. Repainting should be done with sand color paint for natural color wood boxes and remarked in black. For dark wood or weathered boxes use olive drab (OD) paint with yellow markings.

(o) All items selected for shipment to GRA or FMS recipients will have "U.S. Army" markings deleted.

(3) When loss of paint coverage is excessive, complete repainting will be required. Metal containers, metal boxes, or metal crates that have minor scratches and small unpainted areas which would present an unsightly appearance if retouched, may be shipped without repainting. Where packing supports in containers causes loss of paint coverage, repainting is not required (unless rust or corrosion is present).

(4) Metal strapping or wire bands must be properly and uniformly applied and must be tight. Tightening of existing loose wire bands is permissible by utilizing a suitable wire-crimping tool to crimp the wire and staple the crimp to the box. Staples will be sufficient length to afford strength without protruding through the thickness of the applied surface. If wire bands are replaced with metal strapping, it is permissible to cover box markings if no unmarked spaces are available and if essential markings such as lot numbers are not covered. The same type of wire strapping will be used on an individual box. However, wire and strap banding are permitted within a lot. Flat steel strapping, specification ASTM-D3953, is the authorized strapping for GRA or FMS shipments. Lots presently banded with other strapping, which is satisfactory in appearance and application, are acceptable. Only authorized strapping will be used when strapping is replaced due to reworking of materiel, poor appearance, rust on loose bands, etc. Palletized projectiles or bombs (empty or loaded), required for GRA or FMS will be strapped using steel strapping, specification ASTM-D3953.

(5) Minor rust or corrosion on hasps, hinges, or screw heads is acceptable. Major rust or corrosion on hardware will be removed. Where the protective plating is affected by removal of rust or corrosion, the hardware will be painted the same color as the box.

(6) Boxes with dry rot, termite infestation, or other conditions conducive to eventual complete deterioration of the wood or having appearance of weathering or abuse are not acceptable.

(7) Boxes with cleats in different positions (vertical and horizontal) or without cleats within a lot are acceptable if the box meets all other requirements.

(8) Fiber containers opened for inspection or rework operations will be resealed using tape of the same type and size if the container meets appearance standards. If minor fraying occurs during removal of old tape and the waterproof impregnated layer beyond the area normally covered by tape is not destroyed, the container is considered acceptable. It is acceptable to use a wider tape of the same type to cover frayed edges at time of resealing when waterproof impregnated layer is destroyed. Re-taping to merely cover frayed edges is not considered necessary. Fiber containers opened for inspection will be resealed with tape pressure sensitive adhesive, plastic film, filament reinforced, MIL-T-43036 if tape of original type and color is not available.

(9) Discoloration or fingerprints on cartridge cases or marks on base caused by felt pads and chipboard fillers are acceptable if no active corrosion is present. Efforts will be made to improve the appearance of the cartridge case base if reworking is required.

(10) Fixed and semi-fixed ammunition assemblies with fired or resized cartridge cases are not acceptable for FMS.

(11) Containers with tear strips or other self-destroying closing devices that destroy the hermetic seal when opened for any required sample inspection will be acceptable when lids are resealed by means of three wraps of plastic film, pressure sensitive, and filament reinforced adhesive tape (MIL-T-43036). A pull-tab is also required for easy removal of the tape.

b. AMCOM managed materiel.

(1) Samples are to be selected by a QASAS and must be representative of the entire lot under evaluation. The evaluation will include overall condition of the lot in storage.

(2) Rebuilt, repaired, or modified materiel must conform to applicable standards and drawing requirements.

(3) All items selected for shipment to FMS recipients will have "U.S. Army" markings deleted.

(4) Spot paint is allowable provided it does not detract from the appearance of the item and is not on a critical surface. Paint used for spot painting will blend as nearly as possible with the original paint. Brush marks are allowable if runs or sags are not evident. These criteria also apply to spot painting of containers, except that minor scratches (those not exposing the surface) need not be spot painted if they do not materially detract from the appearance of the containers.

(5) Containers with tear strips or other self-destroying closing devices that destroy the hermetic seal when opened for any required sample inspection will be acceptable when lids are resealed by means of three wraps of plastic film, pressure sensitive, and filament, reinforced adhesive tape (MIL-T-43036) A pull-tab is also required for easy removal of the tape.

(6) Obliteration of box or container markings will be accomplished as specified by the current MIL-STD-129. The color of the obliterating paint, enamel or lacquer will match the original basic coloring of the boxes or containers, as nearly as possible. Sand color

(30277 of federal standard 595) will be used on unpainted wooden boxes for obliteration of old markings. The same color and kind of ink will be used to obliterate original markings on any package surface. Embossed markings will be sanded or planed smooth or the panel(s) reversed and the corrected markings applied to match the balance of the markings on the box.

(7) Metal strapping or wire bands must be properly applied, uniform, and secured. Tightness should be determined by using procedures contained in AMC drawing 19-48-4116-20 PA 1002 (Unitizing Procedures for Boxed Ammunition and Components in Palletized Units-Strapped).

(8) Boxes with evidence of dry rot, termite infestation, or other conditions conducive to deterioration of wood or boxes or giving the appearance of weathering or abuse are unacceptable. Boxes must be serviceable.

(9) Items produced and accepted under various waivers and deviations, as indicated by remarks on ammunition data cards or log books, will be require AMCOM clearance prior to FMS shipment. Some clearances may also require customer approval.

12-6. Shipment Procedures for SMCA Managed Materiel.

a. Report of shipment (REPSHIP) notification will be forwarded to SMCA for all GRA or FMS shipments. Installation quality assurance security assistance coordinators (SAPC) and transportation officers will affect appropriate procedures to ensure that a REPSHIP electrical transmission message is furnished within 3 days of shipment.

b. The addressee in paragraph 1-5.d.(20)(a) will provide REPSHIP notification for FMS airlift shipments.

c. DD Form 1650 (ammunition data cards) for SAP shipments will be forwarded to the designated recipient in accordance with DOD 4000.25-8-M (Military Assistance Program Address Directory (MAPAD)). One copy of the ammunition data card for each item or lot will accompany FMS shipments according to DOD 5160.65M (Joint Conventional Ammunition Quality Assurance Policies/Procedures, Part 5). Ammunition data cards will be purified to eliminate remarks such as waivers granted, conversion of one type of ammunition to another type (such as anti-aircraft (AA) to tank ammunition) and other remarks that may be misconstrued by a recipient country. (See paragraph 11-5.e.)

d. DA Form 3022-R (DSR cards) will not be sent on GRA or FMS shipments. Any request for shipment of DSR cards in connection with these shipments will be cleared with the addressee in paragraph 1-5.d.(1).

Table 12-1. Sample Size and Acceptance Criteria for FMS and GRA.

Lot Size	Sample Size	Defective					
		Critical		Major		Minor	
		Acc	Rej	Acc	Rej	Acc	Rej
Item Lot size							
5000 or less	40	0	1	0	1	1	2
5001 - 20,000	80	0	1	1	2	3	4
20,001 or more	120	0	1	2	3	4	5
SAA (up to 50 Caliber) any lot size	450	0	1	7	8	19	20
Number of inner packs in lot							
5000 or less	40	0	1	0	1	1	2
5001 - 20,000	80	0	1	1	2	3	4
20,001 or more	120	0	1	2	3	4	5
Number of outer packs in lot							
5000 or less	40	0	1	0	1	1	2
5001 - 20,000	80	0	1	1	2	3	4
20,001 or more	120	0	1	2	3	4	5

CHAPTER 13.
PROPELLANT AND PROPELLING CHARGES

13-1. Purpose. This chapter provides methods for determining serviceability and chemical stability of nitrocellulose-based propellant and propelling charges.

13-2. Scope. The provisions of this chapter apply to all Army organizations that store bulk propellant, bulk-packed propellant components, or propelling charges, regardless of ownership. Proper use of this chapter will ensure safe storage/serviceability of "standard" propellant items (items that have been assigned standard DODIC's and/or NSN's) and "non-standard" propellant items (items that have not been assigned standard DODIC's and/or NSN's). "Standard" and "non-standard" propellant items include:

a. Bulk propellant used in the loading of production quantities of cartridges/cartridge cases and also used in the assembly of component charges for field service items, such as mortar increments, or used for the manufacture of propellant-filled components such as ignition/igniter bags and charges, expulsion charges, etc.

b. Separate loading and separated charges.

c. Propellant derived (downloaded) from rework or demilitarization operations.

d. Propellant-filled ammunition components (e.g., expulsion charges, igniter bags).

e. Bulk-packed components of nitrocellulose construction (e.g., mortar increment capsules).

WARNING

Nitrocellulose-based propellants can become thermally unstable as they age. The normal aging process of the propellants involves deterioration of the nitrocellulose with an accompanying generation of heat. At some point, the propellant may reach a state where heat is generated faster than it can be dissipated. The accumulation of heat can lead to combustion (autoignition). Chemical stabilizers are added to propellants to slow the aging process. In time, the stabilizer levels will drop to a point where the remaining effective stabilizer (RES) is not sufficient to prevent an accelerating rate of decomposition. When this point is reached, the propellant may autoignite, with possible catastrophic results to property and life. Monitoring the stability level of each propellant lot is essential for continued safe storage (see Table 13-2).

f. Each US Army organization storing propellant and propelling charges is responsible for managing its propellant stocks, which includes RES monitoring. The Propellant Management Guide, published by U.S. Army Defense Ammunition Center, should be utilized in this effort. Any stabilized propellant lot with unknown RES in storage at any Army installation, regardless of ownership is considered to be potentially hazardous and must be reported to the JMC Ammunition Surveillance Division immediately. Any stabilized propellant lot in storage, regardless of ownership, which has exceeded its "Next-Test-Date," must be reported to the JMC Ammunition Surveillance Division) for disposition. Stabilized propellant (except for RDECOM and ATEC non-standard items) in quantities less than the minimum recommended lot size per organization (see Table 13-3) should be issued immediately, or scheduled for demilitarization as soon as practical. Continued monitoring of RES levels is required until demilitarization is complete.

13-3. Definitions.

a. Bulk Propellant. All types and models of granular, sheet, stick, flake, or ball propellant packaged in a bulk container, to be used in loading cartridge cases, for production of separate loading or separated propelling charges, or component charges, or for any other application where nitrocellulose-based propellant is required. Bulk propellant is usually assigned FSC 1376.

b. Bulk-packed components. Propellant components used in the assembly of complete rounds. Includes made-up charges or increments, such as bagged charges for howitzer ammunition; propellant-loaded cartridge cases, primed or unprimed; mortar increments in sheets, bags, or capsules; expelling or expulsion charges (loaded with other than black powder, propellant-filled igniter bags); and small rocket motor grains (rocket assist grains). Component charges are usually assigned FSC 1310, 1315, or 1340.

c. Complete Round. The assemblage of all ammunition components necessary to fire a weapon one time.

d. Separate-loading charges. Bagged and combustible-cased charges stored and issued as end items. Separate-loading charges are usually assigned FSC 1320.

e. Separated charges. Navy propelling charges assembled to a primed cartridge case and issued as end items.

f. Demilitarization: the process of removing military characteristics from materiel. The process of demilitarization involves these two broad categories of methods:

(1) Resource Recovery and Recycling (R3) military munitions for which R3 actions are designated are not considered to be Waste Military Munitions (WMM). For propellants, these actions include conversion to fertilizer, nitrocellulose extraction, re-blending for commercial or military use, use as a component of blasting gel, etc. R3 involves recovering and reusing all or part of the propellant.

(2) Treatment, involves partial or total destruction of the material, which may involve the recycling of component materials, such as metal parts. Items that undergo treatment are usually those that have been declared to be WMM. Treatment is a term used in the world of environmental science. For propellant, the method of treatment most commonly used is destruction by burning.

g. Disposal. Refers to the removal of military munitions from government ownership/control.

h. Propellant Stability List. A list identifying all nitrocellulose-based Army propellant lots under test by

the Army can be accessed on the JMC Ammunition Surveillance Division share point site. If unable to access this data electronically, contact the JMC Ammunition Surveillance Division for assistance.

i. Propellant Stabilizer. Chemical ingredient added to propellant to neutralize the deterioration products of nitrocellulose by slowing down nitrogen oxide (NOx) attacks. The stabilizer lengthens the effective life of the propellant and prevents auto ignition from occurring during normal use and storage. The stabilizer level must be periodically monitored via testing and analysis throughout the storage life of the propellant. Commonly used stabilizers are:

(1) Diphenylamine (DPA).

(2) 2-Nitrodiphenylamine (2-NDPA).

(3) Ethyl Centralite (EC).

(4) Akardite II (AK II).

j. Thermal Stability/Instability. Propellants can auto-ignite when they become thermally unstable. Nitrocellulose-based propellants naturally decompose over time, with an attendant generation of heat. The heat generated can increase the rate of decomposition, which in turn increases the rate of heat generation. As the rate of heat generation accelerates, the system may reach a point where combustion will occur. A system is said to be thermally stable if the heat generated by propellant decomposition can be removed from the system at least as rapidly as it is generated.

13-4. Safety. All personnel using the procedures in this chapter will observe safety precautions cited in DA, AMC, and Army Service Component Command (ASCC) regulations, and in DA Pam 385-64, as applicable.

13-5. Personnel. Sample selection and visual inspection of propellants and propelling charges, air testing of containers, and field stability testing will be conducted by, or under the technical supervision of QASAS careerists. Questions and concerns will be brought to the attention of the responsible QASAS for resolution.

13-6. Surveillance. Surveillance of propellant falls into two categories: visual inspections performed at storage and production activities, and tests, which are conducted as part of the Stockpile Laboratory Test Program. Surveillance determination of serviceability will be based on visual inspection, air testing of propelling charge containers and tests for stabilizer levels and thermal stability. For bulk-stored propellant, the currency of the loading authorization, as reflected in Appendix I, TB 9-1300-385, will also be considered.

13-7. Visual Inspection and Air Test. Sample size and frequency will be in accordance with Chapter 2.

a. Bulk Propellant. Inspection will generally be limited to inner and outer packaging, although any unusual conditions noted concerning the physical state or odor of the propellant will be reported. If condition of packing, such as obvious structural damage or water damage, requires opening the container to determine extent of damage, the condition of the propellant and any other unusual conditions will be noted in writing. Acceptance and rejection criteria will be in accordance with Chapter 2.

b. Separate Loading and Component Charges.

(1) Containers for separate loading charges selected for visual inspection will be air tested prior to opening and after closing. Perform air test in accordance with operational manual for APE 1052-series, Air Test Kit. If the samples test satisfactorily before opening, all containers in the lot are considered to be satisfactory. Containers which leak only after closing shall not be considered defective for lot evaluation, but shall be repaired or replaced before returning to storage. Damaged gaskets on sample containers will be replaced.

(2) Visual inspection will include all external surfaces of each increment, including surfaces where individual increments abut one another. The APE 1991 should be used to test the tensile strength of 155mm propelling charges. Condition of bags, stitching, wrappings, etc., will be noted. Details of visual inspection and classification of defects are contained in paragraph 13-7 and Table 13-1. Charges should be exposed to the air for the minimum time necessary.

(3) 155mm propelling charges 1320-D540 and 1320-D541 returned from SWA.

(a) A Periodic Inspection will be performed on 155mm propelling charges retrograded from SWA in 1991 or 1992 (lots with "y" identifier) prior to issue. If a PI has been performed within the last 90 days, the QASAS in charge can exempt lots from this requirement.

(b) Do not clear lots retrograded from SWA for shipment to combat load, Army Prepositioned Stocks (APS) or USMC AFLOAT.

(c) Test of tensile strength will include cloth on all bags and especially the ends of the bags. Test IAW paragraph 13-7(b)(2). Test must assure that thread used to assemble bag is not deteriorated to a point that it would fail during normal handling.

c. Classification of Defects. Table 13-1 lists defects for separate loading and component charges that supplement surveillance defect standards in Chapter 2.

13-8. Ammunition Stockpile Reliability Program (ASRP) Testing. The ASRP for propellant contains two distinct Stockpile Laboratory Test programs: The Propellant Stability Program and the Propellant Reassessment Program.

13-9. Propellant Stability Program (PSP). This program monitors and analyzes stabilizer levels and stability trends of Army-managed propellant lots, in order to identify potentially unstable propellants in sufficient time to safely remove them from the stockpile through use or through demilitarization. The PSP is centrally administered by the JMC Ammunition Surveillance Division, and consists of two subprograms: Master Propellant Program and Stockpile Propellant Program.

Table 13-1. Propellant Defects Classification and Standards.

Classification	Method of Inspection	Defect Standard
1. Critical:		
a. Cracked/broken igniter tube.	Visual/Manual - non- ferrous rod	
b. Assembly damaged to the extent that Clean Burning Igniter (CBI) or Black Powder Igniter (BPI) can escape without force.	Visual	
c. Igniter charge assembly missing.	Visual	
d. Increments cracked, torn or missing.	Visual	
2. Major:		
a. Metal container lid gasket missing, out of place, damaged, or deteriorated.	Visual	
b. Failure to pass air test.	Air test	DS-1
c. Deteriorated propellant bag.	Manual	DS-2
d. Damaged propellant bag.	Visual	DS-3
e. Mildew or moisture stain on propellant bag.	Visual	
f. Caked igniter.	Manual	
g. Improper/inadequate assembly.	Visual	DS-4
h. Missing components (packing, primer, igniter, etc).	Visual	
i. Container (metal, fiber, barrier bag, wood, etc., excluding separate loading propelling charge containers) deteriorated or damaged to extent requiring replacement. Perforation/tears in plastic liners of M1 Additive jacket are acceptable if jacket remains secure to charge.	Visual	
j. Container for separate loading propelling charges deteriorated or damaged to extent requiring replacement.	Visual	
k. Flash reducer assembly damaged to the extent that salt can escape without force.	Visual	
l. Test plug missing.	Visual	
m. Torque test failure of plug.	Manual	
n. Damaged threads on air sampling port.	Visual	
o. Damaged threads on air sampling plug.	Visual	
p. Combustible case broken or damaged to the extent that propellant can escape (DODICs DA12 and DA13).	Visual	
q. Combustible case with uneven cap (crooked, tilted, or slanted. (DODICs DA12 and DA13).	Visual	
r. Combustible case with cut or puncture through case wall (DODICs DA12 and DA13).	Visual	
s. Combustible case that cannot be repacked into its sleeve due to exterior damage (DODICs DA12 and DA13.	Manual	
3. Minor:		
a. Paint coverage inadequate.	Visual	DS-5
b. Loose lacing/wrapping.	Visual	
c. Container (metal, fiber, barrier bag, wood, etc.) Deteriorated or damaged to extent requiring reconditioning.	Visual	DS-5
d. Any seam or opening incompletely stitched.	Visual	
e. Marking missing, misleading or unidentifiable	Visual	
f. Evidence of poor workmanship.	Manual	
g. Test plug not greased.	Visual	
h. Container seal missing or incorrectly applied.	Visual	
i. Cover incompletely engaged.	Visual	
j. Unit not palletized in accordance with approved drawings	Visual	
4. Incidental:		
a. Discolored propellant bag.	Visual	DS-6
b. Container for separate loading propelling charge deteriorated or damaged.	Visual	DS-5
c. Caked flash reducer. (1) If found, inspect an additional 20 rounds for all defect criteria in this table. (2) DO NOT reject for caked flash reducer. **NOTE**: This requirement is for an inspection of only one additional sample of 20. Do not repeat if caked flash reducer is found in the second sample.	Visual	
*Defect Standards:		

DS-1 Metal container is to be tested at 3-5 PSI, using APE 1052, before opening for inspection and after replacing container cover. Container must be capable of maintaining constant pressure for 10 seconds. Visible decrease in pressure gage reading during the 10-second interval will classify container as defective.

DS-2 Propellant bag with loss of tensile strength is usually accompanied by cloth discoloration as follows:

(a) Brown spots on white silk bags.

(b) Orange spots on green silk bags.

(c) Blue spots on white cotton or rayon blend bags.

The APE 1991 should be used to test the tensile strength of 155mm propellant bags.

DS-3 Propellant bag damaged or incompletely stitched to extent propellant can escape.

DS-4 Stitches, bags, and seals shall be without breaks, tears, grease, or noticeable foreign matter. Increment is in improper order; i.e., charge five assembled where charge three should be.

DS-5 Separate loading propelling charge containers should be considered serviceable if all the following are true:

(a) Sample passes air test regardless of visual condition of lid gasket. Torn or cracked gaskets on samples must be replaced.

(b) Marking is legible.

(c) Rust has not progressed to major defect stage {see paragraph 2-7c(2), Chapter 2}.

Above criteria apply only to material in storage not to new production or to renovated material.

DS-6 Propellant bag discolored (see DS-2) without loss of tensile strength. Lots exhibiting this defect will receive priority of issue for training.

a. Master Propellant Program. Within six months after government acceptance, a five-pound sample of each newly produced lot of bulk propellant is sent to the Army Propellant Surveillance Laboratory (APSL) at ARDEC, and specified in the contract. Samples are monitored throughout the life of the propellant, and Master Sample stabilizer trends are compared with field-stored propellant stabilizer trends.

(1) When a Master Sample test result is stability category "D", a Notice of Ammunition Reclassification (NAR) for that specific lot is issued. The NAR will direct demilitarization of the propellant within 60 days when stored in bulk form, as bulk-packed propellant components or component charges, or as separate loading propelling charges. Note that these suspension actions do not apply to propellant uploaded into fixed or semi-fixed rounds.

(2) A Master Sample with test results of stability category "C" will be compared with field sample results of that lot. Field samples from that lot (index) from all Army storage locations visible on the worldwide ammunition reporting system (WARS) will be tested. If testing of field samples confirm stabilizer category “C”, the lot will be reclassified to CC-C by NAR. Category "C" propellant lots on hand after one year will be re-tested. If the lot has not deteriorated to category "D," it will be retested each year until it has been expended, or it has deteriorated to category "D", at which point it will be demilitarized within 60 days.

(3) Notification of ammunitions suspensions, restrictions and releases for Army account propellant will be managed in accordance with TB 9-1300-385. US Army organizations storing wholesale and retail assets are required per DOD 5160.65M to apply NAVSUP P 801 to all Navy, Marine Corps, and Coast Guard-owned assets. The NAVSUP P 801 provides a listing of suspended, limited use, and unserviceable ammunition and propellant. Temporary suspensions apply to all services; permanent suspensions only apply to the owning service.

NOTE

US Navy NARs for Navy-specific bulk propellants or bulk-packed component charges will not apply when loaded into weapons systems smaller than 5 inch (127mm) that are currently in an Army account. Army experience has demonstrated that uploaded propellants in such rounds have never auto-ignited.

b. Stockpile Propellant Program (SPP). The SPP tests fielded Army propellant assets to assure that environmental effects are accounted for in determining their safe storage condition. The SPP test frequencies vary depending on propellant type, lot history and chemical stability. The Propellant Surveillance Laboratory at ARDEC compares field sample test results with master sample test results. The laboratory also performs the Safe Interval Prediction Test (SIP) for each propellant lot, the results of which are used to establish a Field Retest Date for every lot in the SPP. The SPP includes bulk propellant, bulk-packed components, and separate loading charges. The following items are not included in the SPP and will not be tested unless specifically directed by the JMC Ammunition Surveillance Division:

(1) Propellant when assembled to complete rounds; i.e., mortar, fixed, or semi-fixed ammunition.

(2) Propellant components when assembled as part of a projectile; e.g., expelling charges, expulsion charges.

(3) Rocket propellant, to include rocket assist grains for artillery projectiles.

(4) Any high explosive or propellant ingredient not chemically stabilized; i.e., black powder, RDX, TNT, NC, etc.

(5) LOVA propellant.

(6) Propellant with lost lot identity (see paragraph 13-14).

(7) Combustible container components (except when bulk stored, i.e. mortar increment capsules).

(8) CBI powder in bags when assembled to propelling charges.

NOTE

All propellants stored on an Army installation and not specifically excluded above are part of the SPP. All propellant NOT assembled to a complete round, regardless of how it is stored, is part of the SPP. Bulk propellants and component items containing propellant are included in the SPP prior to loading into complete rounds; any remaining quantities from the lot not uploaded remain in the program for future, periodic testing.

NOTE

If the entire worldwide quantity of a specific propellant lot is assembled into complete rounds, that lot is not tested under the SPP but is continuously monitored in the MPP. When a propellant lot is downloaded (removed) from an end item, its stability must be determined. The Ammunition Surveillance Division at JMC will be contacted for stability determination prior to any maintenance or demilitarization operation that will generate propellant.

Downloaded propellant should be scheduled for reuse, destruction, or transfer to a third party owner within one year of generation (see paragraph 13-13).

Organizations conducting maintenance or demilitarization operations will contact the JMC Ammunition Surveillance Division for stability determination prior to any maintenance or demilitarization operation that will generate propellant.

Lot integrity and RES level of the downloaded propellant will be maintained if the lot is to be retained for any period in excess of 24 hours. Downloaded propellant that is being bulk-stored and marketed for sale must be physically removed from the installation after sale.

c. At the beginning of each FY, the JMC Ammunition Surveillance Division will select candidate lots for SPP testing that FY. JMC will email the list of candidate lots to specific organizations to determine the availability of samples.

(1) Prior to the shipment of any propellant lot, the applicable DSR will be reviewed for availability of the current stability category, the date of the last test, and the date of the next test. If the DSR does not reflect current information, the local QASAS should first consult the propellant stability database, then the JMC Ammunition Surveillance Division, if necessary.

(2) Organizations will retain serviceable requested samples in condition code "D". Samples in CC-H at time of request will be retained in CC-H. Sample quantities will be obligated for shipment to the test facility. Parent lot quantities will be retained in the current condition code and may be issued, pending receipt of sample test results.

(a) Requested samples will be selected and prepared for shipment in accordance with paragraph 13-11. A copy of the DSR card will be forwarded to the test activity for each sample shipped. DA Form 984 (Munitions Surveillance Report) is not required for sample propellant lots. Material Release Orders (MRO) for shipment of samples will be issued by the JMC MLRC.

(b) After completion of testing from a test code group, the propellant stability database will be updated with the latest test results. The JMC Ammunition Surveillance Division will forward the test results to the installation from which the lot samples were drawn. The local ammunition surveillance organization will annotate the results on the local DSR. The JMC Ammunition Surveillance Division will issue a NAR for any Army propellant lot in stability category "C" or "D".

NOTE

Unless otherwise specified in an Army NAR, any stability-related suspensions or restrictions of Army bulk propellant or bulk-pack components will NOT apply to propellant configured and uploaded as a component of fixed, semi-fixed, or separated munitions, for gun systems less than 5 inches (127mm) diameter. Army experience has demonstrated that propellant uploaded in such rounds has never auto-ignited. If downloaded, any and all stability-related suspensions and restrictions will apply.

NOTE

The stability level of bulk WC 864 propellant and bulk stored igniters containing WC 864 propellant will not be considered as representing the stability of igniters assembled to the Modular Artillery Charge System (MACS) propelling charges – DODICS DA12/DA13. When assembled as a charge, stabilizer from the main propellant charge of the MACS migrates to the igniter which increases the stability level of the igniters.

Table 13-2.
Propellant Stability Category Codes

Stability Category	Percent Effective Stabilizer
A	0.30 or more
C	0.29 - 0.20
D	Less than 0.20

NOTE: Propellant stability data for Category "D" propellant will be entered on the end item DSR card for information purposes.

A - Acceptable stabilizer loss; safe for continued storage.

C - Significant stabilizer loss. Lot does not represent an immediate hazard, but is approaching a potentially hazardous stability condition. Loss of stabilizer does not adversely affect functioning in an uploaded configuration. Disposition instructions will be furnished by NAR. All stability category "C" assets on the installation must be reported in writing to the office in paragraph 1-5.d.(1). Report may be sent by fax, e-mail, or telephone.

BULK PROPELLANT and BULK-PACKED COMPONENT lots will be offered for Resource Recovery and Recycling as soon they become stability category "C". One year after becoming stability category "C", a sample of the bulk propellant lot or the bulk-packed component lot will be retested. If the lot has not deteriorated to category "D", it will be retested each year until it has been expended, or it has deteriorated to category "D", at which point it will be demilitarized within 60 days. Exceptions may be approved by the JMC Ammunition Surveillance Division.

SEPARATE LOADING PROPELLING CHARGES should be issued for use to preclude loss of assets. One year after becoming stability category "C", a sample from the lot will be retested. If the lot has not deteriorated to category "D", it will be retested each year until it has been expended, or it has deteriorated to category "D", at which point it will be demilitarized within 60 days. Exceptions may be approved by the JMC Ammunition Surveillance Division.

D – Unacceptable stabilizer loss. Lots identified as stability category "D" present a potential safety hazard and are unsafe for continued storage as bulk, bulk-packed components, or as separate loading propelling charges. Bulk propellant, bulk-packed components, and separate loading propelling charges will be demilitarized within 60 days after notification of category "D" status. After the lots are demilitarized, written notification will be made to the JMC Ammunition Surveillance Division, which will forward the notification to the JMC Demilitarization Office. If the 60-day demilitarization suspense cannot be met under any circumstance, local commanders will elevate this critical shortfall through their chain-of-command. Notification will also be sent to the JMC Ammunition Surveillance Division.

SOUTHWEST ASIA (SWA) "Y" LOTS - Stability test results for SWA "Y" lots will apply to the basic (non-SWA) lot as well, and vice versa, unless otherwise directed by JMC.

13-10. Propellant Reassessment Program (PRP). This program involves the test and evaluation of stored propellant to determine the functional serviceability prior to loading into a major item. It does not apply to items intended exclusively for Research, Development, Test & Evaluation (RDTE). Whenever possible, the oldest propellant lot(s) will be selected for the PRP. The JMC Ammunition Surveillance Division is responsible for the final determination of functional serviceability of bulk propellant and component charges (including suitability of component LAT) under the PRP, and the JMC Ammunition Surveillance Division is responsible for providing the notification of loading authorization via Appendix I, TB 9-1300-385. The functional serviceability will be determined by a laboratory reassessment test (closed bomb), a ballistic test, or combination of both. These tests will be performed only when an actual need for the propellant or bulk-packed component exists. Sample selection and shipment will be in accordance with paragraph 13-11, unless otherwise directed by the JMC Ammunition Surveillance Division. Propellant classified as "Master" or "Reference" lots are exempt from the PRP requirements in this bulletin. Bulk propellant and bulk-packed component charges having a current loading authorization, and that are otherwise serviceable, will be classified CC-A; those otherwise serviceable lots without a current loading authorization will be classified CC-D.

a. Request for reassessment testing of field service stocks will be coordinated with the JMC Ammunition Surveillance Division and supply item manager not less than 120 days before the loading is to commence. The reassessment request will contain:

(1) Lot number and NSN of propellant/ propelling charge requiring reassessment.

(2) Estimated start date of project requiring reassessed lot(s).

(3) NSN, lot number(s), and quantity of material to be reworked.

b. JMC will coordinate the reassessment test so that the samples arrive at the test facility no later than 60 days before the maintenance project is to commence.

c. Ballistic testing at a proving ground will be performed as required by the JMC.

d. Loading authorizations are issued at time of initial acceptance, and are provided via Appendix I, TB 9-1300-385 for reassessments performed in accordance with the requirements of the PRP. Component functional serviceability is determined at time of performance test and renewed with each successive performance test. Expiration dates of initial acceptance (or LAT) and performance test are based on the following:

(1) Propellant compositions M5, M10, M26, and M26E1 are valid for 2 years, regardless of pack.

(2) Other types stored in metal or metal-lined wood containers (level A) are valid for 5 years.

(3) All types stored in fiber drums are valid for 2 years.

e. The expiration date of the loading authorization for the lot will be annotated on the DSR and will be noted on the shipping documents. All applicable propellant lots with a current loading authorization will be listed in Appendix I of the latest edition of the TB 9-1300-385, or in the JMC Ammunition Surveillance Division share point site.

f. If a propellant lot's loading authorization expires during a maintenance program, a GS-12 or higher grade QASAS from the servicing ammunition surveillance organization may permit an extension of up to 180 days to allow completion of the active maintenance program under which the reassessment was requested. Otherwise, lots with expired loading

authorizations cannot be loaded until reassessed.

g. All OCONUS shipments of bulk propellant or component charges will be cleared through the JMC Ammunition Surveillance Division, and only CC-A material will be approved for shipment. Material to be shipped must be in support of an upcoming or on-going maintenance operation, and material shipped must have a minimum of nine months remaining on the loading authorization upon arrival OCONUS.

13-11. Selection, Preparation and Shipment of Propellant Samples For Stockpile Propellant Program.

a. Sample Selection:

(1) Bulk packed increments and charges for mortars will be shipped in quantity specified by sample requests. The propellant will not be removed from the increment bags. Sample shipment will be made using the current NSN and lot number. The sample size will be approximately one-half pound of propellant per lot, with every effort made to request sample quantities that are standard units of issue.

(2) Unless otherwise designated, the bulk propellant sample size will be one pound.

(3) Separate loading charges and 105mm propelling charges will consist of complete charges to be shipped in the quantity specified by the sample request (usually one pound).

b. Sample Preparation:

(1) Outer pack for samples will consist of standard ammunition packs meeting the requirements of Title 49, Code of Federal Regulations (CFR), or latest Bureau of Explosives (BOE) Tariff 6000. Approved outer packs for propellant samples include M2A1 ammunition container (as allowed per the latest revision of Special Packaging Instruction (SPI) ADP1376-002), metal-lined wood boxes, metal drums, and fiber drums, which meet both the maximum container load limit for which they were Performance Oriented Packaging (POP) tested, and the applicable packaging drawing marking requirement.

(2) Place samples in a VELOSTAT MIL-D-82645plastic bag of minimum size to hold the sample and allow grounding if necessary. Seal bag by one of the three following methods: (1) folding the opening over three times to close and apply two single wraps of tape that overlaps itself a minimum of one inch; (2) gather the opening together and tie with a twist tie; (3) use a zip-lock closure. Place the cushioned samples in an M2A1 Small Arms Container, in accordance with SPI ADP 1376-002. Alternate packaging methods that meet POP requirements are as follows:

(a) 8135-01-185-6816 (roll of MIL-PRF-81705 barrier material); 8105-00-837-7756 (Ziploc type bag 11 X 10); 8105-00-837-7757 (Ziploc type bag 12 X 12); 8135-00-282-0565 (MIL-PRF-131 barrier material to overpack plastic bags); 8135-01-015-2810 (MIL-PRF-131 barrier material to overpack plastic bags); 8105-01-274-3585 and 8105-01-382-7369 (MIL-B-82647 material).

(b) Refer to MIL-STD-652 for bulk container using metal drums, fiber drums, or metal-lined wood boxes.

(c) If a telescoping spiral-wound fiber container having metal ends and double-foil inner wrap is used for bagged propellant/increment(s), add cushioning at both ends as required to obtain a tight pack, and close with two wraps of tape.

(d) If large grain or stick propellant is to be shipped, wrap each item with plastic wrap, or bag and tape it. Cushion as required with bubble-wrap or closed-cell foam material.

(3) Expose samples to the air for the minimum time needed to package. Do not desiccate samples. Type or print legibly on a card the following information: NSN, lot number (if dual granulation, both lot numbers), name of the submitting installation, and test. Enclose card with sample in the inner pack. Include DSR card and ammunition data card for each lot. Pack dual grain charges separately; on the identification card, identify the grain as single-perforated (SP) or multi-perforated (MP). Do not print sample data directly on inner pack, i.e., aluminized bag. Flaking of bag material results in loss of sample data.

c. Sample Shipment. Samples will be shipped per directions in the Material Release Order from JMC.

d. The JMC MLRC issues the MRO for shipment of samples to the designated test installation.

13-12. Selection, Preparation and Shipment of Samples for Propellant Reassessment Program.

a. Bulk propellant sample selection:

(1) Select five containers that are representative of the entire lot.

(2) Remove two pounds of propellant from each container. If charge is of dual granulation, remove 2 pounds of each component propellant lot from each container. If propellant is packaged as component charges, bags must be removed. After sample quantity has been removed, residue from component charges is authorized for demilitarization.

b. Bulk-packed component sample selection:

(1) Sample size will be in accordance with LAT requirements of the load, assemble and pack (LAP) specification for the component.

(2) Select samples that are representative of the entire lot. Remove two pounds of propellant from each container. If charge is of dual granulation, remove two pounds of each component propellant lot from each container. If propellant is packed as component charges, bags must be removed. After sample quantity has been removed, residue from component charges is authorized for demilitarization.

c. Bulk propellant sample preparation:

(1) Seal and package separately each two pound sample as specified in paragraph 13-11b.

(2) Each two-pound sample container will be marked with propellant nomenclature, lot number, and number of container from which removed; e.g., container 1, 2, 3, 4, or 5. Do not print sample data directly on the inner pack; e.g., aluminized bag.

Flaking of bag material results in loss of sample data.

(3) The outer pack will be as specified in paragraph 13-11b(1), except for one end, which will be painted white and stenciled in black ink, "For Reassessment Test PROP-QAS (assigned number). The outer pack will contain the entire 10-pound sample.

d. Bulk-pack component sample preparation:

(1) The outer pack will be as specified in paragraph 13-11 above, except for one end, which will be painted white and stenciled in blank ink, "For Performance Verification Test PROP-QAS (then assigned number from JMC QAS).

(2) Each container will be marked with the component nomenclature and lot number.

e. Sample shipment. Samples will be shipped per directions in the MRO from JMC.

f. The JMC MLRC issues the MRO for shipment of samples to the designated test installation.

13-13. Reclaimed/Derived Propellant. Written coordination with the JMC Ammunition Surveillance Division shall occur before the start of any operation generating bulk propellant which will not be demilitarized within 60 days of generation. If the propellant will not be demilitarized within 60 days, the following shall occur:

a. The local ammunition surveillance organization and the JMC Ammunition Surveillance Division will review the storage history of each end item lot, looking for evidence of storage in extended temperature or moisture extremes that might have adversely affected the propellant. Separate-loading or bulk propellant in any account with an unknown storage history will be considered as having been exposed to extended periods of extremes of heat and/or moisture and will be burned within 60 days of discovery unless otherwise directed by the Propellant Stability Program Manager, Headquarters, Joint Munitions Command.

b. A sample of each propellant lot to be downloaded will be tested for stabilizer. In lieu of testing, the propellant can be downloaded if the quantity downloaded is demilitarized within 60 days of downloading. Bulk propellant of either unknown stability or Category "D" that is retained for any length of time greater than 24 hours must be isolated from other ammunition and explosives (i.e., placed in a dedicated magazine.)

NOTE

Propellant lots that have been determined by the JMC Ammunition Surveillance Division to be potentially hazardous to retain in storage, regardless of stability category, will be demilitarized within 60 days after download.

13-14. Lost Lot Identity. Propellants with lost lot identity cannot be tested to determine current level of stabilizer, since the specific propellant index cannot be identified. Therefore, these lots represent a potential safety hazard. Propellant with lost lot identity will not be retained in storage in any account. Propellant with lot numbers "MIXED," "UNKNOWN" or "NONE" as part of the lot number will be demilitarized within 60 days of discovery. Immediately contact the JMC Ammunition Surveillance Division if further instructions and/or assistance are needed. Installations will annually screen assets of all ownerships for lots with lost lot identity.

13-15. Minimum Lot Size. Installations are responsible for managing their propellant stocks. Table 13-3 establishes a recommended minimum lot size per installation for retention.

Table 13-3. Propellant Minimum Lot Size*

Weapon System	Propellant Charges or Increments
105mm	100 propelling charges
155mm	50 propelling charges
60mm	1200 increments
81mm	300 increments A 2400 increments B
4.2 Inch	7500 full increments 300 half-increments
120mm	1200 Donut increments
Bulk Propellant	50 pounds

Since performing stability tests on very small lots is not economically feasible, lot quantities less than the above should be transferred to CC-H, and disposition instructions obtained from the JMC MLRC. Organizations retaining less than 50 pounds per lot of bulk propellant for "special" projects will continue to monitor for stabilizer content. Lots retained for "special" projects, regardless of quantity, must be tested and the storing installation will ensure the JMC Ammunition Surveillance Division is provided annual visibility by list each March.

13-16. Reporting Requirements of Stabilized Propellant. At least one yearly review (at interval not to exceed 15 months) of propellant lots in storage against the information contained in the "Propellant Stability Database". This database resides in the Munitions History Program (MHP). The review is needed to ensure that stability category (A, C, D) is determined by the percentage result entered in the "MIN" column of the "Propellant Stability Database". Column heading "MIN" is the lowest result ever recorded for a lot. Errors or omissions discovered during a review will be immediately reported to the JMC Ammunition Surveillance Division.

a. Bulk propellant, bulk-packed components, and separate loading charges in storage in government owned facilities, and not reported via the Worldwide Ammunition Reporting System (WARS), will be reported to the JMC Ammunition Surveillance Division. This reporting requirement ensures that both the JMC Ammunition Surveillance Division and the local surveillance office have the latest stability test results for all non-WARS propellant that is located inside the installation boundary in a configuration capable of auto-ignition (e.g. bulk packaged, separate loaded charges, etc.). Current stabilizer visibility must be maintained for all propellant lots stored on each government installation even if the propellant is owned by or under the control of a non-DOD or commercial activity. The QASAS having direct oversight responsibilities at installation(s) not reporting propellant assets via the WARS will ensure the timely submission, each March, of the following data:

(1) NSN/DODIC.

(2) Propellant Lot Number/Index number.

(3) Quantity (pounds, charges, increments, etc.).

(4) Stability Category.

(5) Date of Last Stability Test.

(6) Goverment owned/non-government owned (indicate which).

(7) Owner account.

b. Storage of propellant declared "excess" by JMC will not exceed two years at installations lacking non-emergency demilitarization capability, unless authority to deviate is granted in writing by the JMC Ammunition Surveillance Division.

13-17. Propellant on Prepositioned (PREPO AFLOAT) Ships. A listing of candidate propellant lots to be considered for storage aboard PREPO AFLOAT ships will be transmitted by a representative of the Army Sustainment Command (ASC) to the JMC Ammunition Surveillance Division for review.

a. Each propellant lot selected for PREPO AFLOAT storage must meet the following conditions:

(1) PI conducted within 12 months of selection.

(2) Stability test performed within the past three years.

(3) Is in Stability Category "A".

(4) Stability retest not required for at least five years.

b. A lot will not be selected for PREPO AFLOAT storage unless current test results support a predicted minimum of five years' safe shipboard storage.

c. At least 60 days prior to any PREPO AFLOAT vessel's return to port for maintenance and inspections, the ASC representative will submit a list of all propellant lots aboard to the JMC Ammunition Surveillance Division. The JMC Ammunition Surveillance Division requires retesting of any PREPO AFLOAT propellant lots that have not been stability tested within the past three years. The JMC Ammunition Surveillance Division may require samples to be prepared and shipped to a laboratory for test, or may arrange for on-site testing at the maintenance/inspection port.

13-18. Safety Surveillance of Navy Gun Propellant. This program applies to Navy-developed propellant, and is centrally administered by the Navy. The Navy performs safety surveillance of gun propellant in a program that parallels that of the Army. The Navy relies heavily upon Fume Tests of master samples. It applies the results of fume test failures to the propellant lot in bulk and to the end item into which the propellant lot is assembled. Fume test failures are reported via a permanent Navy NAR, as a supplement to NAVSUP P 801.

NOTE

Since the Army is DOD's single manager for demilitarization, condemned Navy-developed materiel will be transferred to Army ownership for demilitarization. Once under Army ownership and control, ALL of the propellant stability management practices described in this chapter for Army Propellant will prevail.

13-19. Storage and Demilitarization of Non-Standard Propellants. This paragraph defines non-standard propellant and provides guidance for the storage, demilitarization and testing of non-standard propellant and propellant items that do not fall under the Propellant Stability Program (PSP).

a. The JMC Quality Assurance Surveillance Division manages the Army's PSP for nitrocellulose-based propellant and propellant items containing any of the stabilizers listed in paragraph 13-3 and specifically listed in the "NSNs for Propellant Items" spreadsheet located under the Policies & Procedures tab on the JMC Ammunition Surveillance Division share point site at: https://jmcsp.osc.army.mil/sites/mlrc/qa/qas/qasurveillance/default.aspx.

b. Non-standard propellant and propellant items that do not fall under the PSP are those typically defined with one or more of the following and shall be tested for stability by the owner:

(1) Are not assigned a NSN or DODIC.

(2) Do not have an assigned propellant index.

(3) Do not have a propellant description sheet/propellent acceptance sheet (PDS/PAS).

(4) Are of foreign origin and not produced under DOD contract.

(5) Propellant that is manufactured and/or procured specifically for research development and test (RD&T).

(6) Propellant that has been mixed or is a mixture of two or more propellant lots (does not include propellant produced under DOD contract IAW applicable mil-spec).

(7) Any propellant that cannot be tested due to unknown origin, unknown type, unknown index or unknown formulation.

(8) Any propellant or propellant item that does not meet the definition of a military munition as defined in 40 CFR 260.10.

c. Owners of non-standard propellant and/or propellant items in storage longer than 60 days shall identify to the installation senior QASAS and Accountable Officer the DOD program or test the propellant or propellant items are to be used for to include an estimated date of use. Any non-standard propellant in storage longer than two years, that has not been identified with a DOD program or test will be considered hazardous waste and is authorized for demilitarization. Demilitarization will not be accomplished until the owner/program office has been notified. The local QASAS and installation safety office will ensure the owner complies with demilitarization and environmental requirements.

d. The DOD/SMCA Designated Disposition

Authority (DDA) has authorized the assignment of CC-V to those propellant and propellant items above and remaining in storage longer than 2 years.

e. Non-standard propellant in storage should be limited to the minimum amount required and should be stored separate from GFM.

f. All non-standard propellant assigned to a DOD program or test retained in storage longer than two years is required to be tested IAW this chapter at owner's expense. The test results will be provided to the installation senior QASAS and safety office. The local QASAS may also request a formulation test at owner's expense of nitrocellulose based non-standard propellant to determine composition and testability for continued safe storage.

g. Local QASAS and safety will monitor RES levels of these propellant lots to ensure no unstable and/or untested propellant remains in storage. The propellant stability category specified in Table 13-2 will be used for determining if propellant is safe for continued storage.

CHAPTER 14.
(AMMUNITION) LOGISTICS ASSISTANCE PROGRAM (LAP)

14-1. Purpose.

This chapter prescribes the roles and responsibilities of QASAS assigned to the Logistics Assistance Program, as outlined in AR 700-4 and AMC regulation 700-3. The primary purpose of the (Ammunition) LAP is the early detection and resolution of ammunition logistics problems in order to both assist commanders to sustain the readiness and safety of their Class V stocks and to provide the AMC Life Cycle Management Commands (LCMC) feedback concerning ammunition performance, quality characteristics, and other logistics concerns encountered in the field.

14-2. Personnel.

QASAS selected for assignment in the (Ammunition) LAP will have current knowledge and broad experience in ammunition logistics.

Ammunition Logistics Assistance Representative (LAR). Throughout this chapter the term "Ammunition Logistics Assistance Representative (LAR)" or Ammunition LAR will be used to define those QASAS assigned to the LAP program.

14-3. Responsibilities.

Ammunition LARs provide commanders with advice and recommendations to assist them in attaining and sustaining the readiness and safety of their Class V stocks. Their responsibilities include:

d. Providing commanders with technical guidance necessary to resolve ammunition and systemic logistics problems.

e. Identifying and reporting, through channels, all ammunition logistics functions that have an adverse impact on logistics readiness. This includes supply, maintenance, transportation, personnel, training, organization, systems, and doctrine.

f. Providing a means to collect, correlate, assess, and disseminate logistics information required to respond to problems from the materiel or users.

g. Establishing an organizational structure and procedures for contacting field units.

h. Providing commanders with a single POC for ammunition logistics assistance.

i. Assisting units in identifying, reporting, and providing guidance in the use or replacement of stocks affected by NARs, AINs, or Safety of Use Messages.

j. Analyzing, advising, assisting, and in some cases, providing training in areas of ammunition logistics. Training will supplement, not replace individual and unit training.

k. Keeping the supported commander informed of their activities, readiness degradation, or degradation trends on JMC furnished materiel.

l. Maintaining contact throughout the conventional and missiles ammunition communities in order to provide and disseminate information regarding total life-cycle ammunition and explosives logistics to/from the NICP, engineering/R&D, and PEO/PM ammunition communities.

m. Providing LCMC's logistics support activity managers a means to observe and identify materiel and logistics systems problems in the field.

n. Assisting with logistics problems affecting materiel readiness that are supported commanders' responsibility but are beyond their capability or organic resources.

o. Analyzing field operations to determine the ammunition logistics impact and requirements for improvement.

p. Improving logistics support based on materiel analyses, contact with using units, and other sources.

q. Furnishing command information and assistance on ammunition modernization.

r. Developing and coordinating plans to ensure that required assistance will be provided during mobilization, hostilities, and other contingencies.

s. Deploying as part of the Army Field Support Brigades and subordinate elements (Logistic Support Elements (LSE), Brigade Logistic Support Teams (BLST)) to support mobilization, contingencies and/or training events.

14-4. Relationship to Command Surveillance Organizations.

Upon request, Ammunition LARs may supplement command surveillance organizations in performance of the QASAS functions outlined in this SB. QASAS functions, when accomplished by Ammunition LARs, will be performed under the direction of the command senior QASAS or his/her designated representative, using procedures outlined in command regulations or directives, and locally approved SOPs. Ammunition LARs will not be used to fill the requesting command's vacant authorizations or increase its' authorized resources, rather to assist them in ensuring the readiness and safety of ammunition or operations where command surveillance coverage may be inadequate. LAR support to command surveillance organizations will not detract from their primary logistics assistance mission.

14-5. Procedures.

Ammunition LARs may provide assistance to supported units by performing any of the safety and logistics functions described throughout this SB: Examples include:

d. Magazine inspections.

e. Review of handling, storage, shipping operations.

f. Inspection of transport vehicles.

g. Monitoring of demilitarization operations.

h. Training Range Support:

(1) Malfunction investigations.

(2) Briefing units prior to training commencement.

(3) Area inspections.

(4) Observe firings and consulting with troops.

(5) Monitor unit turn-ins.

e. Port operations.

f. Preparation of site plans/explosive safety waivers.

g. Basic load inspections/technical assistance visits.

14-6. Senior Command Representatives (SCR).

Ammunition LARs assigned to Combatant Commands (CENTCOM, PACOM, EUCOM, etc.) will provide staff assistance and Class V technical support on a wide-range ammunition logistics issues to support COCOM readiness, OPLANS and CONPLAN development, and contingency and training operations.

14-7. Reporting.

Ammunition LARs will generate weekly reports listing their significant activities to HQ JMC (AMSJM-RDO). These reports are intended to summarize the accomplishment of those responsibilities outlined in paragraph 14-3.

APPENDIX A
REFERENCES

A-1. Department of Defense Publications.

DOD 4000.25-8-M	MILITARY ASSISTANCE PROGRAM ADDRESS DIRECTORY (MAPAD) SYSTEM
DOD 4160.28-M-V1	DEFENSE DEMILITARIZATION: PROGRAM ADMINISTRATION
DOD 4160.28-M-V2	DEFENSE DEMILITARIZATION: DEMILITARIZATION CODING
DOD 4160.28-M-V3	DEFENSE DEMILITARIZATION: PROCEDURAL GUIDANCE
DOD 5100.76-M	PHYSICAL SECURITY OF SENSITIVE CONVENTIONAL ARMS, AMMUNITION AND EXPLOSIVES
DOD 6055.09-M	DOD AMMUNITION AND EXPLOSIVES SAFETY STANDARDS
DODD 5160.65	SINGLE MANAGER FOR CONVENTIONAL AMMUNITION (SMCA)
DODI 4140.62	MATERIAL POTENTIALLY PRESENTING AN EXPLOSIVE HAZARD
DODI 4160.28	DOD DEMILITARIZATION (DEMIL) PROGRAM

A-2. Military Standards.

MIL-STD-129	MILITARY MARKING FOR SHIPMENT AND STORAGE
MIL-STD-1168	AMMUNITION LOT NUMBERING AND AMMUNITION DATA CARD

A-3. Military Handbooks.

MIL-HDBK-138	GUIDE TO CONTAINER INSPECTION FOR COMMERCIAL AND MILITARY INTERMODAL CONTAINERS
MIL-HDBK-1461	AMMUNITION MANUFACTURERS AND THEIR SYMBOLS

A-4. Army Regulations.

AR 5-9	AREA SUPPORT RESPONSIBILITIES
AR 25-50	PREPARING AND MANAGING CORRESPONDENCE
AR 75-1	MALFUNCTIONS INVOLVING AMMUNITION AND EXPLOSIVES
AR 190-11	PHYSICAL SECURITY OF ARMS AMMUNITION AND EXPLOSIVES
AR 385-10	THE ARMY SAFETY PROGRAM
AR 385-63	RANGE SAFETY
AR 700-13	WORLDWIDE AMMUNITION REVIEW AND TECHNICAL ASSISTANCE PROGRAM
AR 700-15	PACKAGING OF MATERIEL
AR 700-19	U.S. ARMY MUNITIONS REPORTING SYSTEM (WARS)
AR 700-20	AMMUNITION PECULIAR EQUIPMENT
AR 702-6	AMMUNITION STOCKPILE RELIABILITY PROGRAM
AR 702-7	PRODUCT QUALITY DEFICIENCY REPORT PROGRAM
AR 702-12	QUALITY ASSURANCE SPECIALIST (AMMUNITION SURVEILLANCE)
AR 710-2	SUPPLY POLICY BELOW THE NATIONAL LEVEL
AR 725-50	REQUISITION, RECEIPT, AND ISSUE SYSTEM
AR 735-11-2	REPORTING OF SUPPLY DISCREPANCIES
AR 740-1	STORAGE AND SUPPLY ACTIVITY OPERATIONS

A-5. Department Of Army Pamphlets.

DA PAM 40-8	OCCUPATIONAL HEALTH GUIDELINES FOR THE EVALUATION AND CONTROL OF OCCUPATIONAL EXPOSURE TO NERVE AGENTS GA, GB, GD, AND VX
DA PAM 40-173	OCCUPATIONAL HEALTH GUIDELINES FOR THE EVALUATION AND CONTROL OF OCCUPATIONAL EXPOSURE TO MUSTARD AGENTS H, HD, AND HT.
DA PAM 385-61	TOXIC CHEMICAL AGENT SAFETY STANDARD
DA PAM 385-64	AMMUNITION AND EXPLOSIVES SAFETY STANDARDS
DA PAM 710-2-1	USING UNIT SUPPLY SYSTEM (MANUAL PROCEDURES)
DA PAM 710-2-2	SUPPLY SUPPORT ACTIVITY SUPPLY SYSTEM: MANUAL PROCEDURES
DA PAM 750-8	THE ARMY MAINTENANCE MANAGEMENT SYSTEM (TAMMS) USERS MANUAL

A-6. Technical Bulletins.

TB 9-1300-278	GUIDELINES FOR SAFE RESPONSE TO HANDLING, STORAGE, AND TRANSPORTATION ACCIDENTS INVOLVING ARMY TANK MUNITIONS OR ARMOR WHICH CONTAIN DELPETED URANIUM
TB 9-1300-385	MUNITIONS RESTRICTED OR SUSPENDED
TB 9-1315-257-12	OPERATOR AND UNIT INFORMATION FOR CARTRIDGE, 120MM: CANISTER, M1028 (NSN 1315-01-516-5248)
TB 9-1330-211-14	OPERATOR, FIELD AND SUSTAINMENT INFORMATION FOR GRENADE, HAND, RUBBER BALL, NON-LETHAL, GG04
TB 700-2	DEPARTMENT OF DEFENSE AMMUNITION AND EXPLOSIVES HAZARD CLASSIFICATION
TB 43-180	CALIBRATION AND REPAIR REQUIREMENTS FOR THE MAINTENANCE OF ARMY MATERIEL

A-7. Technical Manuals.

TM 3-23.25	SHOULDER LAUNCHED MUNITIONS
TM 9-1015-203-12	OPERATOR AND UNIT MAINTENANCE MANUAL FOR HOWITZER, LIGHT: TOWED, 105-MM, M101A1 (NSN 1015-00-322-9752)
TM 9-1015-234-10	OPERATOR`S MAINTENANCE MANUAL FOR HOWITZER, LIGHT, TOWED: 105-MM, M102 (NSN 1015-00-086-8164)
TM 9-1015-252-10	TECHNICAL MANUAL, OPERATOR`S MANUAL FOR HOWITZER, LIGHT, TOWED: 105-MM, M119A2, NSN 1015-01-482-4914
TM 9-1015-254-13&P	MORTAR SUBCALIBER INSERT: M303 (NSN 1015-01-377-4824)
TM 9-1055-886-12&P	M287 9-MM TRACER BULLET TRAINING DEVICE (NSN 1055-01-207-2684)
TM 9-1230-782-13&P	DISPENSING SET, MUNITION, NETWORK COMMAND: SPIDER, XM7 (NSN: 1230-536-0128); MUNITION CONTROL UNIT, XM10 (NSN: 1346-01-538-3145); LAUNCHER AND LINE, NETWORK COMMAND MUNITION: EXTENDED RANGE TRIPLINE SENSOR, XM9 (NSN: 1346-01-538-3141); LAUNCHER AND GRENADE, NETWORK COMMAND MUNITION: MINIATURE GRENADE LAUNCHER, XM8 (NSN: 1346-01-538-3120); AND TRAINER, DISPENSING SET, MUNITION, NETWORK COMMAND (NSN: 6920-01-568-7847)
TM 9-1300-200	AMMUNITION, GENERAL
TM 9-1300-214	MILITARY EXPLOSIVES
TM 9-1300-251-20&P	ARTILLERY AMMUNITION FOR GUNS, HOWITZERS, MORTARS, RECOILLESS RIFLES AND 40MM GRENADES LAUNCHERS
TM 9-1300-251-34&P	ARTILLERY AMMUNITION FOR GUNS, HOWITZERS, MORTARS, RECOILLESS RIFLES AND 40MM GRENADES LAUNCHERS
TM 9-1315-249-12&P	81MM MORTAR TRAINING DEVICE, 81MM SABOT (INERT) M1 AND 22MM SUB-CALIBER PRACTICE CARTRIDGES M744, M745, M746, AND M747
TM 9-1315-252-12&P	CARTRIDGE 81MM TARGET PRACTICE (SHORT RANGE) M880 (NSN 1315-01-216-7071) (1315-C876)
TM 9-1315-886-12	LAUNCHER AND CARTRIDGE, 84 MILLIMETER: M136 (AT4)
TM 9-1330-200-12	GRENADES
TM 9-1330-200-34	GRENADES
TM 9-1340-222-20	2.75-INCH LOW SPIN, FOLDING FIN AIRCRAFT ROCKETS; 2.75-INCH SPIN STABILIZED, WRAP AROUND FIN AIRCRAFT ROCKETS; 66MM LIGHT ANTITANK WEAPON SYSTEMS; 3.5-INCH ROCKETS; AND M3A2E1 ROCKET MOTOR (JATO)
TM 9-1340-222-34	2.75-INCH LOW SPIN, FOLDING FIN AIRCRAFT ROCKETS, 66MM LIGHT ANTITANK WEAPON SYSTEMS, 3.5-INCH ROCKETS AND M3A2E1 ROCKET MOTOR (JATO)
TM 9-1345-203-12	LAND MINES
TM 9-1345-203-34	LAND MINES
TM 9-1346-215-10	MUNITION, CROWD CONTROL MODULAR, NON-LETHAL: M5 (NSN: 1346-01-524-3348)
TM 9-1375-213-12	DEMOLITION MATERIALS
TM 9-1375-213-34&P	DEMOLITION MATERIALS
TM 9-1375-215-13&P	MK 2 MOD 0, MINE CLEARANCE SYSTEM (MARINE CORPS) AND MINE CLEARANCE LINE CHARGE - MICLIC (ARMY)
TM 9-1375-219-13&P	DEMOLITION KIT, BREACHING SYSTEM, ANTI-PERSONNEL OBSTACLE (APOBS) (DODIC, MN79) (NSN 1375-01-426-1376) AND DUMMY DEMOLITION KIT, BREACHING SYSTEM, ANTI-PERSONNEL OBSTACLE (APOBS) (DODIC MN84) (1375-01-467-1277)
TM 9-1377-200-20	CARTRIDGES, CARTRIDGE ACTUATED DEVICES, AND PROPELLANT ACTUATED DEVICES
TM 9-1377-617-12	MUNITION, CROWD CONTROL MODULAR, NON-LETHAL: M5 (NSN 1377-01-464-2605)
TM 9-2350-264-10-1	TANK, COMBAT, FULL-TRACKED: 120-MM GUN, M1A1
TM 9-2350-264-10-2	TANK, COMBAT, FULL-TRACKED: 120-MM GUN, M1A1
TM 9-2350-388-10-1	TANK, COMBAT, FULL-TRACKED: 120-MM GUN M1A2 SYSTEM ENHANCEMENT PACKAGE
TM 9-2350-388-10-2	TANK, COMBAT, FULL-TRACKED: 120-MM GUN, M1A2 SYSTEM ENHANCEMENT PACKAGE (SEP)
TM 38-250	PREPARING HAZARDOUS MATERIALS FOR MILITARY AIR SHIPMENT
TM 43-0001-27	ARMY AMMUNITION DATA SHEETS FOR SMALL CALIBER AMMUNITION
TM 43-0001-28	ARMY AMMUNITION DATA SHEETS FOR ARTILLERY AMMUNITION: GUNS, HOWITZERS, MORTARS, RECOILLESS RIFLES, GRENADE LAUNCHERS AND ARTILLERY FUZES
TM 43-0001-29	ARMY AMMUNITION DATA SHEETS FOR GRENADES
TM 43-0001-30	ARMY AMMUNITION DATA SHEETS FOR ROCKET SYSTEMS, ROCKET FUZES AND ROCKET MOTORS
TM 43-0001-36	ARMY AMMUNITION DATA SHEETS FOR LAND MINES
TM 43-0001-37	ARMY AMMUNITION DATA SHEETS FOR MILITARY PYROTECHNICS
TM 43-0001-38	ARMY AMMUNITION DATA SHEETS FOR DEMOLITION MATERIALS

TM 43-0001-39	ARMY AMMUNITION DATA SHEETS FOR CARTRIDGES, CARTRIDGE ACTUATED DEVICES (CADS) AND PROPELLANT ACTUATED DEVICES (PADS)
TM 43-0001-47	ARMY AMMUNITION DATA SHEETS FOR AMMUNITION PECULIAR EQUIPMENT (APE)
TM 43-0001-61	ARMY AMMUNITION DATA SHEETS REMOTE MUNITIONS

A-8. Field Manuals.

FM 3-19.4	MILITARY POLICE LEADERS` HANDBOOK
FM 3-19.15	CIVIL DISTURBANCE OPERATIONS
FM 3-23.30	GRENADES AND PYROTECHNIC SIGNALS
FM 3-34.214	EXPLOSIVES AND DEMOLITIONS
FM 4-30.1	MUNITIONS DISTRIBUTION IN THE THEATER OF OPERATIONS

A-9. Supply Bulletins.

SB 742-1305-94-20	SMALL ARMS AMMUNITION TRACE TESTING
SB 742-1375-94-423	CHARGE, DEMOLITION: BLOCK, M3, M5A1, M112, AND CHARGE ASSEMBLY, DEMOLITION: M37 SERIES OR M183; AMMUNITION SURVEILLANCE PROCEDURES

A-10. Army Materiel Command Regulations.

AMCR 385-100	SAFETY MANUAL
AMCR 700-107	PREPARATION OF STANDING OPERATING PROCEDURES FOR AMMUNITION OPERATIONS

A-11. Drawings.

DWG 1948-75-5	INDEX OF U.S. ARMY UNITIZATION, STORAGE, AND OUTLOADING DRAWINGS FOR AMMUNITION AND COMPONENTS

A-12. Project Manager for chemical Demilitarization.

PMCD 742-4	AMMUNITION SURVEILLANCE PROGRAM

A-13. Other References.

BOE 6000 BUREAU OF EXPLOSIVES
DTR 4500.9R DEFENSE TRANSPORTATION REGULATIONS
29 CODE OF FEDERAL REGULATIONS
46 CODE OF FEDERAL REGULATIONS
49 CODE OF FEDERAL REGULATIONS

OTHER REGULATIONS ARE LISTED IN APPENDICES BY ITEM.

APPENDIX B
MUNITIONS HISTORY PROGRAM

B-1. General:

The purpose of the Munitions History Program (MHP) application is to collect and store inspection and test data and track ammunition technical history quality assurance data. This system replaces the current Depot Surveillance Record (DSR) Card, including the SDS system and other systems now being used to collect field data. All organizations are required to use the Munitions History Program to maintain their DSR information where internet connectivity is available. In locations where internet connectivity is not available the use of other methods of recording DSR data is authorized. There also is an offline capability module to be developed, which will allow the MHP system to be used while offline and when the computer is next connected to the internet the data will replicate to the MHP server.

B-2. Application: The MHP application and database provides the following:

a. Flexible, robust, user-friendly data screens and reports.

b. A method of interfacing to external data sources to include the Joint Hazard Classification System (JHCS), World-Wide Ammunition Reporting System (WARS).

c. Interfaces to load the NIIN, lot and serial data so that user does not have to type in this information.

d. Printable versions of the DSR card.

e. Maintains the inspection history for each lot and serial number.

f. Ability for the administrator to grant access to individual modules as well as an application that defines access levels within the system.

B-3. Web Address: The Web-site for MHP can be found at https://mhp.redstone.army.mil/. Users are required to have an AKO/password account to access the system. Access rights to MHP can be granted by sending an e-mail to: ROCK-AMSJM-QAS@CONUS.ARMY.MIL

B-4. MHP Access: The following information is required for access to MHP:

a. AKO user name.

b. Military Service Grade, GS/NSPS employee, service branch, contractor employee (government or non-government contractor).

c. User location (UIC).

d. Desired user access level.

B-5. User Access Levels: The following access levels are provided for the MHP application. Senior surveillance personnel will determine the appropriate access level, 1, 2 or 3, for their personnel. The MHP administrator at the Joint Munitions Command will input the AKO user name and access level into MHP.

a. Level 1 – Read only.

b. Level 2 – User.

c. Level 3 – Supervisor.

d. Level 4 – Administrator – allow access and modification to all areas.

B-6. MHP Modules: The following modules are available in the MHP application to select from:

a. New Inspection: Allows user to enter information pertaining to a QASAS ammunition inspection, including comments. This may also be used for administrative comments on ammunition groups.

b. View Inspection: Allows users to browse/review inspections which have been entered and approved (MHP historical data).

c. Final Review: Administrators to review inspections entered and edit, delete, or approve them.

d. Suspension/Restrictions: Provides a listing of restricted and suspended munitions that will assist personnel responsible for storage, issue, use, testing, inspection, maintenance, and transportation of munitions.

e. Legacy Data: MHP historical inspection data; for limited locations. This module contains all electronic DSR data.

f. User Access: Allows user to add, edit or remove module access rights for users at levels below their own. Module is a Level 4 authorization only.

g. Maintenance: Add, edit, or remove items from the many tables which support the drop-down lists used by the MHP program. Module is a Level 4 authorization only.

h. Forum: Allows users to leave constructive comments regarding the MHP application, including bugs encountered and suggested improvements or modifications.

i. Help Desk: Allows user to enter a problem or question that they need a response to. They will be contacted by the appropriate Help Desk personnel when submitting a request.

j. Reports: Currently this module allows users to extract data only for use in analysis. Future upgrades will include reports/databases where data can be input such as in the quality management report (124 report). New reports will be added as found necessary and suggestions will be accepted in the help desk module. Current reports are as follows:

(1) Serial history – Serial numbered item search for inspection histories.

(2) Transaction history in TB - Compares shipping/receiving transaction to the TB 9-1300-385 (future enhancement will include AF and Navy suspension/restriction data comparison).

(3) Date of next inspection – Allows organizations develop inspection schedules.

(4) Quality Management Report/124 Admin Report – This module is currently under development and is expected to be operational within FY09.

(5) WARS (On Record) – Includes near real time WARS data and comparison to TB 9-1300-385

B-7. New Inspections:

a. Access: Requires an access level of 2, 3, or 4 as well as administrator granted right to view this module. (No read-only access).

b. Purpose: Allow users to enter and save information creating a new munitions inspection.

c. Applicable Rules:

(1) Allows user to pull munitions histories from other UICs (locations), or to create an inspection/comment if one does not exist.

(2) Provides level 3 and 4 users with option to auto-approve inspection prior to saving the inspection.

(3) Allows user to enter multiple munitions (i.e. NIIN-lot-serial combinations) for each inspection record.

(4) Users can associate multiple lots with each inspection record.

(5) Users can associate multiple serial numbers for a specific lot with each inspection.

(6) Users can enter one and only one UIC.

(7) Users can enter multiple defect codes for each inspection record (and for each of these specific areas: outer pack, inner pack, item, and general).

(8) Allows the user to enter Administrative comments for a NIIN-lot-serial combination.

B-8. View Inspections:

a. Access: Requires an access level of 1, 2, 3, or 4, as well as administrator granted right to view this module.

b. Purpose: Allow users to view existing inspections.

c. Applicable Rules:

(1) Lists inspections that have already been approved.

(2) Users can select to view “inspections” or a DSR Card information.

(3) Allows users to switch between inspections and DSR card information.

B-9. Final Review:

a. Access: Requires an access levels of 2, 3, or 4 as well as administrator granted right to view this module.

b. Purpose: Allow users to review, edit, and approve or delete inspections.

c. Applicable Rules:

(1) Does not list inspections which have already been approved unless specifically requested.

(2) If user creates an inspection and checks auto-approve, the inspection will not show up in the Final Review Module.

(3) Users can approve multiple inspections at a time.

(4) For deletion, DSR summary page is shown first to confirm that deletion of this record is desired.

(5) Level 2 users can review, edit inspections for all level 2's at the same UIC as the current user.

(6) Level 2 and 3 users can only delete their own inspections.

(7) Level 3 users can review, edit, or approve inspections for all level 2's and level 3's at the same UIC as the current user.

(8) Level 4 can edit any other levels’ inspections from any UIC.

(9) Users may edit comments for the number of working days that is set in the maintenance module (Days to auto-approve section). If the inspection has not been approved after this period of time, the system will automatically approve it.

(10) Allows user to view approved inspections.

B-10. Suspensions/Restrictions:

a. Access: All levels, providing user has access to this module.

b. Purpose: To provide a listing of restricted and suspended munitions that will assist personnel responsible for storage, issue, use, testing, inspection, maintenance, and transportation of munitions.

c. Applicable Rules:

(1) JMC manages Part I items and reporting.

(2) AMCOM manages Part II items and reporting.

(3) Part I and Part II list all JMC or AMCOM munitions that are currently suspended, restricted, or released.

(4) Suspensions can be entered at any of these four levels: serial, lot, NIIN, or DODIC.

(5) Restrictions can be entered at any of these four levels: serial, lot, NIIN, or DODIC.

(6) Remarks can be entered at any of these four levels: serial, lot, NIIN, or DODIC.

(7) “Relevant S/R data” includes S/R matches at all four levels: serial, lot, NIIN, or DODIC.

B-11. Legacy Data:

a. Access: Only available online. Requires an access level of 1, 2, 3, or 4, as well as administrator granted right to view this module.

b. Purpose: Allows user to view and print DSR information (includes scanned and legacy electronic DSR's) entered into systems prior to MHP.

c. Applicable Rules:

(1) Data is searchable and printable.

(2) Data is read-only.

B-12. Access Levels:

a. Access: Requires an access level of 4, as well as administrator granted right to view this module.

b. Purpose: Allows user to review, modify and control access levels and authorized modules for users below themselves.

c. Applicable Rules:

(1) Can only view and modify information for users whose access level is less than the current users' access level.

(2) Users cannot modify their own access information.

(3) New users must be added to the user access table when a login is created for them. Default access level is 1, read-only.

(4) Access level and module authorization determine what options will be presented to each user on the MHP main menu.

B-13. Maintenance:

a. Access: Only available in online mode. Requires an access level of 4 as well as administrator granted right to view this module.

b. Purpose: Allow limited user maintenance of drop-down lists and other data used in MHP program.

c. Applicable Rules:

(1) Tables that are used to create drop-down lists may have the option to review, add, modified, or delete by level 4 users.

(2) Days to auto-approve may be reviewed or modified by level 4 users.

(3) Allows level 4 to delete inspections.

B-14. Help Desk:

a. This module allows you to enter a question, suggestion, or problem that you are having with the MHP application. Someone from the MHP Help Desk will contact you to respond to your question.

b. To access the ASIS-MHP Help Desk feature, click on 

, available on the Main Menu Page. This will take you to the Help Desk entry page where you will have the following options:

(1) Submit a Help Desk Question/Problem.

(2) View Open Questions/Problems.

(3) View Closed Questions/Problems.

(4) Search the Help Desk Database.

B-15. MHP Access Problems:

a. Personnel experiencing problems accessing MHP during normal working hours, 0600-1630 CST, need to contact DSN 793-6982, commercial 309-782-6982, email ROCK-AMSJM-QAS@CONUS.ARMY.MIL

b. After duty hours, personnel experiencing problems accessing MHP need to contact the Operations Center, JMC, DSN 793-7270, commercial 309-782-7270, email ROCK-JMC-OPCTR-OP@CONUS.ARMY.MIL.

APPENDIX C
AMMUNITION CONDITION CODES

Definition:	Amplification:
CODE A SERVICEABLE (ISSUABLE WITHOUT QUALIFICATION) New, used, repaired, or reconditioned materiel, which is serviceable and issuable to all customers without limitation or restriction. Includes materiel with more than 6 months shelf-life remaining.	Normal incidental requirements for additional packaging, packing, or marking, etc., that can be accomplished at time of issue (without additional resources or manpower or causing a delay) does not constitute a restriction.
CODE B SERVICEABLE (ISSUABLE WITH QUALIFICATION) New, used, repaired, or reconditioned materiel which is serviceable and issuable for its intended purpose; however it is restricted from issue to specific units, activities, or geographical areas by reason of its limited usefulness or short service-life expectancy. Includes materiel with 3 through 6 months shelf-life remaining.	Normal incidental requirements for additional packaging, packing, or marking, etc., that can be accomplished at the time of issue (without additional resources or manpower or causing a delay) does not constitute a restriction. Includes items restricted from or to specific missions.
CODE C SERVICEABLE (PRIORITY OF ISSUE) Items that are serviceable and issuable to selected customers, but which must be issued before conditions A and B materiel to avoid loss as usable assets. Includes materiel with less than 3 months shelf-life remaining.	
CODE D SERVICEABLE (TEST/MODIFICATION) Serviceable materiel that requires test, alteration, modification, conversion, or disassembly. This does not include items that must be inspected or tested immediately prior to issue.	
CODE E UNSERVICEABLE (LIMITED RESTORATION) Materiel which involves only limited expense or effort to restore to serviceable condition and that is accomplished in the storage activity where the stock is located.	Minor maintenance is exterior to the round or munitions. Includes all repair of external surfaces and repair or replacement of packaging, packing, palletization, and marking.
CODE F UNSERVICEABLE (REPAIRABLE) Economically reparable materiel which requires repair, overhaul, or reconditioning (includes reparable items which are radioactively contaminated).	Major maintenance usually requires replacement of end item components or modification.
CODE G UNSERVICEABLE (INCOMPLETE) Materiel requiring additional parts or components to complete the end item prior to issue.	
CODE H UNSERVICEABLE (CONDEMNED) Materiel which has been determined to be unserviceable and does not meet repair criteria (includes condemned items that are radioactively contaminated).	Includes material determined to be uneconomically repairable. Includes Army materiel that became unserviceable by reason of shelf/service life expiration.
CODE J SUSPENDED (IN STOCK) Materiel in stock, which has been suspended from issue and use pending condition classification or analysis, where the true condition is not known.	Includes Temporarily Suspended material pending serviceability determination. Army ammunition that has missed two scheduled periodic inspections is included. Includes Air Force materiel that is identified and held for future test/surveillance requirements, either destructive or nondestructive in nature. May contain formerly serviceable assets that became unserviceable by reason of being reserved for test or shelf/service-life has expired.

CODE K SUSPENDED (RETURNS)
Materiel returned from customers or users and awaiting condition classification.

Includes items that have been identified by stock number and item name, but not examined for condition. Stocks in this CC will be inspected and properly classified as to condition according to the appropriate regulations. When more time is required, an extension of time may be granted by the applicable accountable supply distribution activity.

CODE L SUSPENDED (LITIGATION)
Materiel held pending litigation or negotiation with contractors or common carriers.

CODE M SUSPENDED (IN WORK)
Materiel identified on inventory control records but which has been turned over to a maintenance facility or contractor for processing.

CODE N SUSPENDED (SUITABLE FOR EMERGENCY COMBAT USE)
Ammunition stocks suspended from issue except for emergency combat use.

CODE P UNSERVICEABLE (RECLAMATION)
Materiel determined to be unserviceable, uneconomically reparable as a result of physical inspection, tear-down, or engineering decision. Item contains serviceable components or assemblies to be reclaimed.

Assigned as directed by the owning Service.

CODE Q SUSPENDED (QUALITY DEFICIENT EXHIBITS
This code is for intra-Air Force use only. Quality Deficient exhibits returned by customer/user as directed by the inventory manager due to technical deficiencies reported by Quality Deficiency Report. Exhibit requires technical or engineering analysis to determine cause of failure to perform IAW specifications.

CODE R SUSPENDED (RECLAIMED ITEMS, AWAITING CONDITION DETERMINATION)
Assets turned in by reclamation activities, which do not have the capability (e.g., skills, manpower, or test equipment) to determine the materiel condition. Actual condition shall be determined prior to induction into maintenance activities for repair/modification.

CODE S UNSERVICEABLE (SCRAP
Material that has no value except for its basic materiel content. No stock shall be recorded as on hand in Supply Condition Code S. This code is used only on transaction involving shipments to DRMOs. Materiel shall not be transferred to Supply Condition Code S prior to turn-in to DRMOs if materiel is recorded in Supply Condition Code A thru H at the time materiel is determined excess. Materiel identified by NSN shall not be identified by this supply condition code.

CODE V WASTE MILITARY MUNITIONS
Material identified as Waste, Military Munitions.

Assignment will only occur under the coordinated authority of a designated DOD or Service Designated Disposition Authority (DDA). Prior to the custodial CC-V request, the WMM must meet criteria of WMM under the DOD Military Munitions Rule Implementation Policy and must have a current inspection.

APPENDIX D
SECTION I. LIST OF SPECIFIC ITEMS

Ammunition Identification Codes (AIC) or Other Outdated Markings....D-1
Ammunition Manufactured for Special Purposes....D-2
Ammunition, 40mm....D-3
Black Banding....D-4
Blasting Caps, Electric....D-5
Bombs, Inspection for Heli-Coil Inserts....D-6
Bursters, Tetrytol....D-7
Cartridge Actuated Devices (CAD) and Propellant Actuated Devices (PAD)....D-8
Cartridge, 90mm, HEAT, M371A1 (1315-C282)....D-9
Cartridges, 152mm....D-10
Charges, Supplementary....D-11
Components, Explosive....D-12
Conventional Ammunition in Demil Account....D-13
Dynamite....D-14
HERA Projectile Defect Classification (ICM)....D-15
Items Belonging to Other Services....D-16
Items Which Have Not Been Hazard Classified....D-17
Marker, Location, Marine, MK25 (1370-L554)....D-18
Mine, AP, M18-series....D-19
Mine, AT, HE, M15....D-20
Mine, AT Heavy M19 Non-Metallic....D-21
Permanent Suspension of Material in SMCA Managed Accounts....D-22
Projectile Receipt Inspection....D-23
Projectile 155mm, Illuminating, M485 Series (1320-D505) and Projectile 155mm, Infrared Illuminating, XM1066 (1320-DA49)....D-24
Projectile, 155mm, M825 Series Defect Classification....D-25
Projectile, 8 inch, M404....D-26
Rocket, 66mm, Incendiary, M74....D-27
NSNs for Electrostatic Packing Material....D-28
Identification of Ammunition Stored in Southwest Asia (SWA) During Desert Storm/ Desert Shield....D-29
Cartridge 105mm HE M1 (1315-C445); Projectile 155mm HE M795 (1320-D529); Projectile 155mm HE M107 (1320-D544)....D-30
Simulator, Pyrotechnic, Main Tank Gun M30 (1370-LA06), Simulator, Pyrotechnic, Direct/Indirect Fire Cue (DIFCUE) M31A1 (1370-LA07)....D-31
Smoke Pot, Floating, HC, M4A2 (1365-K867)....D-32

SECTION II. INSTRUCTIONS FOR SPECIFIC ITEMS

D-1. Ammunition Identification Codes (AIC) or Other Outdated Markings.

a. Ammunition lots marked with the AIC in lieu of NSN and DODIC (and otherwise acceptable) will be considered suitable for issue, training or inter-depot shipment without remarking the outer pack or palletized load. Annotation of NSN and DODIC is required only on shipping documents, ammunition data cards, and depot surveillance record cards.

b. Ammunition lots marked with AIC in lieu of the NSN and DODIC will not be issued for PREPO or basic load.

c. For information pertaining to the correct NSN/DODIC for a lot marked only with an AIC, contact the office in paragraph 1-5.d.(1).

d. Incorrect DOT shipping names will normally be corrected on accessible exterior packages prior to shipment. When it can be determined by the shipper that the marking was correct at some previous time, the materiel need not be remarked. Shipping documents will be annotated with the correct DOT shipping name.

e. Weapon model designations on boxes and containers need not be corrected to comply with current drawings.

f. Items containing dual nomenclature markings within a lot (e.g., "cartridge" on boxes and fiber containers and "shell" on the round) are acceptable.

g. Current markings will be applied whenever items or packaging are marked for other reasons.

D-2. Ammunition Manufactured for Special Purposes.

a. Certain lots of conventional ammunition were manufactured for special purposes: i.e., proving ground tests, engineering tests, etc., these lots were formerly identified by use of "PG", "SR", "SP", "A", "E", "P" lot interfix and/or word "PILOT" in the lot number. Special purpose ammunition of recent manufacture with the 13-digit lot number, as directed by MIL-STD-1168, is identified by the letters "S", "E", "A", or "P" in position number 10 (position 8 for propellant lots).

b. Ammunition manufactured for special purposes generally is not intended for actual firing as service or training ammunition. Such issues must be specifically authorized by JMC.

c. Non-functioning ammunition items (dummy, inert, drill, etc.) do not require any special authorization for troop issue. Generally, identification of this materiel as a special lot implies manufacture using standard service round technical data package with "special lot" identifying the inert nature of the material.

d. To prevent issue of special purpose ammunition or components for unauthorized use by using units, the following will be accomplished:

Lots other than non-functioning that are in field service, depot renovation, or similar accounts, and that have not been specifically authorized for troop use, will be reported by memorandum to the addressee in paragraph 1-5.d.(1). Report will provide NSN, nomenclature, lot number, quantity, and account. Copies of the ADC and DSR should be included. Authorization for troop issue shall be based upon verification that production complied with the technical data package requirements applicable to standard lots. Response from JMC must be annotated on the DSR. Receipts of special purpose lots will be reported unless the DSR indicates authorization was previously obtained. Serviceable lots will be assigned CC-D pending response from JMC.

Reporting is not required for special purpose lots identified by non-standard NSN or maintained in supply accounts which preclude issue to using units. Examples are demilitarization, proving ground (TECOM), and research and development accounts.

e. Ammunition manufactured for calibration and reference purposes is assigned a 13-digit lot number with letter "C" or "R" in position 10 (position 8 for propellant lots). Reporting procedures for these lots are the same as for other special purpose lots except that reports will be submitted to the addressee in paragraph 1-5.d.(20)(b). The response from JMC must be annotated on the DSR.

D-3. Ammunition, 40mm.

Cartridges that are assembled into linked belts will not be removed from their links for inspection or gaging purposes. Cartridges that appear to be damaged to the extent they might not chamber in the weapon should be reported on ACR to JMC Surveillance Division.

D-4. Black Banding.

New Army ammunition production is required to be palletized with galvanized banding. If any is received with black banding, the packaging office should be notified for investigation of contract. Contact packaging office addressee in paragraph 1-5.d.(23). Black banding utilized for palletization should be identified during damage in transit inspection.

D-5. Blasting Caps, Electric.

a. Defect and inspection criteria outlined in appropriate TMs, drawings, specifications and paragraph 2-7 of this bulletin will be used. In addition, the following criteria will be applied:

b. No more than one circumferential crack is permitted in the lead wire insulation at any or at all of the points where the wire is normally bent more than 90 degrees when in the authorized packaging configuration.

c. A longitudinal crack of less than ½-inch long with only one crack per 6-inch length of the wire is considered acceptable.

d. More than one circumferential crack, or more than one longitudinal crack of less than ½-inch, or combination of both in a segment of wire less than 6 inches is considered a minor defect.

e. Longitudinal cracks longer than ½-inch, longitudinal crack terminating in a circumferential crack, or flaking of the insulation in any part of the wire are considered major defects.

D-6. Bombs, Inspection for Heli-Coil Inserts.

h. NCB/MHQ assets of DODICS E462, E463, E464, E465, E466, E470, E471, E480, E481, E482, E483, E485, E487, E488, E489, F226, F227, F228, F237, F243, and F244 are to be placed in CC-E if all of the following conditions apply:

Assets were manufactured prior to 1 March 1968, or have an unknown date of manufacture.

Assets have none of the following markings:

The letter "A" stenciled after the load date.

The letters "HC" or "HCT" stamped near the lug wells.

The designation "AAB 423 INC" stenciled on the item.

i. Items placed in CC-E per the above guidance require 100% visual inspection to verify that no Heli-Coil is present.

j. If Heli-Coil is not present, and item is otherwise serviceable IAW acceptance criteria in applicable technical publications, item should be placed in appropriate serviceable condition code.

k. If Heli-Coil is present, a pull test of the Heli-Coil IAW procedure AAB 423 is to be performed. Items successfully completing this procedure, and which are otherwise serviceable IAW inspection criteria contained in applicable technical publications, will be reassigned an appropriate serviceable condition code. Items failing the pull test shall be reported for disposition instructions IAW appropriate technical guidance. Annotate DSR with inspection and test results.

D-7. Bursters, Tetrytol -- All munitions with tetrytol bursters will be placed in CC-F for replacement of bursters. Screening for evidence of explosive growth or exudation prior to issue for use is not considered practical or timely.

D-8. Cartridge Actuated Devices (CAD) and Propellant Actuated Devices (PAD).

a. All malfunctions, discrepancies, and accidents involving Army FSC 1377 CADS or PADS will be reported by the most expeditious means available to JMC Surveillance Division, according to AR 75-1. Suspected items (discrepant, malfunctioning, or involved in an accident) will be separated from condition code "A" materiel and clearly labeled "HOLD FOR ENGINEERING INVESTIGATION."

b. CADs or PADs service limits. These time limits are designated as shelf life and installed life (service). Shelf life and installed life will not be combined. The usable life of a CAD or PAD is expired if either of these limits are exceeded. Expired CADs or PADs must not be used without specific approval of the designated technical command. Service limits are based on design verification tests and surveillance evaluation by stockpile/service return reliability test program. Compliance with these limits, which can be found in appendix D of TB 9-1300-385, is mandatory.

c. Computation of shelf life and installed life. CAD or PAD lives are based on shelf life or installation life, whichever date occurs first is the CAD or PAD service limit expiration date. To compute shelf life or installation life, use the criteria below:

Shelf Life. Date of manufacture (DOM) plus Army-published shelf-life equals shelf-life expiration date. The DOM is denoted within the CAD or PAD lot number printed on the item or on a tag attached to the item. The year of manufacture is denoted as a two-digit number (spaces 4 and 5) immediately following the manufacturer's designation (spaces 1 through 3). The month of manufacture is denoted by an ALPHA character (space 6) immediately following the year designation ("A" represents January, "B" represents February, and so on. The letter "I" is not used).

Installed Life. Installed life begins when the CAD or PAD airtight container is opened, regardless of the reason. This date plus the Army-published installed life limit equals the installed life expiration date. The installed life expiration date will never exceed the shelf life expiration date.

All Army units (installation, ASP, user) will comply with limits cited in appendix D of TB 9-1300-385 and supplements thereto. Additional data can be found in TM 9-1377-200-20 and TM 43-0001-39-Series publications. If a conflict on service limits is encountered, TB 9-1300-385 takes precedence. Questions on shelf or service life or requests for installed (service) life extensions should be directed to Ammunition Surveillance Division, HQ JMC, Rock Island.

d. Shelf life and installed life expiration. All Army CAD/PAD lots with an expired shelf or installed life will be reclassified to CC-H; exceptions to CC-H reclassification can be found in Appendix H to TB 9-1300-385. Requests for disposition for expired CADs/PADs will be made to the JMC using the CAD Disposition Worksheet available at the website listed in paragraph 1-5.d.(21)(e). Surveillance testing is performed on expired CADs/PADs to verify reliability and determine if shelf/installed life limits can be extended. Failure to provide required information on the worksheet might cause needed samples to be eliminated from test program thus jeopardizing Army test plans. Dollar limitation and disposal provisions of DA PAM 750-8 do not apply for this material.

Army service return of downloaded CADs or PADs will be tagged using DD Form 1577. Annotate remarks block with the following information:

Aircraft model and tail number.

Date CAD/PAD installed.

Date CAD/PAD removed.

Expired and expended items removed from mission configuration by using units will be returned to the supporting ASP/storage facility.

The appropriate accountability, management controls, and documentation will be established or maintained for new item issues and to assure unit turn-in of all downloaded items.

If the original packages are not available, packages for replacement items will be used for repack and turn-in of unserviceable CAD or PAD.

If an item is selected/required for the CAD Surveillance test program, ship the item(s) to: addressee in paragraph 1-5.d. Documents for shipment should be marked: "Army CAD/PAD Surveillance Program, Notify CODE 5240A at 301-744-2325."

e. Condition code classification. CAD or PAD lots will be classified according to the provisions of AR 725-50 based upon the remaining shelf life and paragraph D-8d above.

f. Army stockpile test program for CADs or PADs in storage. JMC will furnish a nomination memorandum to each storage location from which test samples are desired. The sample size required for test will be furnished with the request for samples. Only the specific quantity requested for each lot will be shipped.

Each candidate lot from which samples have been selected for testing will be retained in the appropriate CC as determined by the local surveillance organization (QASAS). Candidate lot test samples at the installation will be placed in CC-D and obligated for shipment.

The MRO for shipment of test samples to NSWC, IH, will be issued by HQ JMC, Rock Island.

One end or side of the shipping container will be painted white. Shipping documents and containers will be annotated "ARMY CAD/PAD SURVEILLANCE PROGRAM".

Random sampling for selection of samples will be used where possible.

g. Inspection requirements. The owning service establishes appropriate inspection, quality assurance standards, and serviceability requirements. The appropriate requirements in Chapter 2 apply in addition to the specific inspection/technical provisions of TM 9-1377-200-20 and TM 43-0001-39. Inspection of CAD/PAD packing will be IAW applicable Special Packaging Instructions (SPI) used at time of manufacture. SPIs are available on the Surveillance website referenced in paragraph 1-5.d.(21)(f).

Hermetically sealed containers will not be opened unless packaging shows evidence of moisture or damage to the extent that contents may be unusable. Tear-strip and paint can type containers with RTV sealed lids are considered hermetically sealed containers.

Heat sealed barrier or plastic bagged items are to be considered equivalent to hermetically sealed items. Heat sealed material will not be opened unless there is evidence of moisture or damage to package contents.

Where capabilities exist, opened containers will be resealed IAW Chapter 2; otherwise use repackaging procedures IAW Chapter 3, TM 9-1377-200-20. Installed life begins on the date the container was opened. All opened containers (hermetically sealed and barrier/plastic bag) will be repacked and appropriately marked. Mark each opened/repacked CAD/PAD container: "OPENED (date as applicable)" in a conspicuous place. Markings can be hand written using an indelible marker. Each layer of packing will be marked with container open date. A tag, with applicable "OPENED (date)" markings, will also be secured to the outer pack. This is to allow identification and verification of remaining installed life of container contents. DSR must be annotated with container open date (month/year). Opened containers will be given highest priority of shipment/use.

D-9. Cartridge, 90mm, HEAT, M371A1 (1315-C282).

a. Surveillance inspections of 90mm, M371A1 cartridges will be limited to visual inspections. No disassembly is authorized.

b. Nose cap removal will be performed only as part of an authorized screening or renovation operation at a prescribed maintenance facility. Unauthorized nose cap removal and reassembly has been determined to

allow metal particle contamination of nose, resulting in possible premature functioning of the fuze and projectile.

D-10. Cartridges, 152mm.

Rounds assembled with the older M157 cartridge case that used an adhesive and lock ring system have been suspended. In that system looseness between the cartridge case and projectile was a major defect. The latest model cartridge case, the M205, is mechanically secured to the projectile. Since there may be some shrinkage in the case material, relative motion may occur between the M205 cartridge case and the projectile. If the cartridge case is intact (without cracks), the ignition element secured to the case, and the cartridge case is not separated from the projectile, the round will be considered serviceable.

D-11. Charges, Supplementary.

a. MIL-C-50417, Amendment 2. The defect classification for supplementary charges with loose pellets, as shown in MIL-C-50417, amendment 2, is applicable for new manufacture only and will not be used during inspection of fielded stocks. Loose pellets are not considered cause for rejection of supplementary charges in either bulk pack or assembled in complete rounds/projectiles.

b. Supplementary Charge Part Number 883820:. Polyethylene supplementary charge pads (DWG 8838203, rev D) in 155mm, M549A1 HERA projectiles may be compressed to less than 1/16-inch thickness. This condition occurs when projectiles are assembled with energy absorbing lifting plugs which have an intrusion depth ¼-inch longer than shock attenuating or "G" type lifting plugs. Compressed polyethylene pads do not present a safety hazard during storage, transportation, handling, or firing and are not to be considered a defect.

c. Supplementary Charge NSN 1320-00-824-0811 DX02, Part Number 8797090.

(1) Charges manufactured prior to April 1987 are no longer authorized for use in Army Maintenance of howitzer projectiles. Pending replacement of pads, charges may only be assembled to cartridge, 4.2 inch, HE M329 series.

(2) All affected wholesale and retail bulk stock (unit returns) are to be reclassified to condition code "F". This appendix does not apply to charges already assembled to ammunition. Proving grounds are exempt from compliance with appendix.

(3) Acceptable charge manufactured in accordance with drawing 8797090 revision P (and subsequent revisions) has an oversize pad that causes charge to be firmly wedged into projectile.

(4) Presence of oversize pad reduces likelihood that supplementary charge is displaced should projectile be rammed without fuze or plug. Over run of charge and consequent in-bore explosion is thus prevented.

D-12. Components, Explosive.

See paragraph 4-8.

D-13. Conventional Ammunition in DEMIL Account.

a. Unserviceable conventional ammunition in Demil accounts, excluding guided missiles and rockets where lot/serial number accountability is required, separate loading propelling charges, and bulk propellant, may be assigned to aggregate lots providing the following criteria are met:

All lots are of the same DODIC/NSN.

All lots are in the same condition code.

No lots are suspended from issue, movement and use (SIMU).

b. Where this procedure is applied, all lot numbers that constitute an aggregate lot will be listed on the applicable DSR for the aggregate lot or on a locally developed log. Aggregate lots will be assigned lot number "MIXED-XXX" where "XXX" is a sequential number. Local procedures will be developed to limit the quantity of individual lots consistent with safe and efficient operations. When this is done, lots making up an aggregate lot may be stacked together in storage, and safety in storage (SIS) inspection may be based on sample taken from one of the constituent lots.

D-14. Dynamite.

a. Commercial dynamite.

Straight dynamite, 60-percent and over in strength, will be turned at regular intervals as directed in DA PAM 385-64 and will be annotated on a locally devised form that will be attached to the stack. Other types of dynamite, ammonia, ammonia-gelatin, and gelatin dynamites will not be turned in storage. However, yearly, at the conclusion of the hottest portion of the year, a representative sample will be selected and the containers examined for evidence of nitroglycerin exudation on the exterior of the cartridge. If exudation is found, the lot or lots involved will be reported on DA Form 2415 with a recommendation for destruction.

Dynamite contained in Canine Explosive Scent Kit (Dynamite, 75% Ammonium Nitrate and 40% Nitroglycerin) has a shelf of 18 months. This dynamite need not be turned in storage. However, at the conclusion of the hottest portion of the year, a representative sample of the nitroglycerin based dynamite, will be selected and examined for evidence of nitroglycerin exudation.

Dynamite with discolored oily stains is not considered hazardous; see appendix W, paragraph W-6a and i. Dynamite exhibiting exudation (measurable liquid or nitroglycerin crystals) will be destroyed in accordance with local procedures.

b. Military dynamite. Military dynamite does not require turning in storage but will be periodically inspected per procedures outlined in Chapter 2 and the following information.

Exudation, crumbling, disintegration, or cracking of military dynamite are classified as major defects. In the absence of these conditions, loose explosive that is wholly contained by the inner pack is not to be considered a defect.

New production dynamite will have dark brown spots and colorations. It may also have a slick feel due to a wax coating applied to the outer wrapper. These are

not defects unless accompanied by an oily exudate or crystallization.

Lots known to contain loose explosives that have migrated outside the inner pack (in any amount) will be repacked prior to shipment.

D-15. HERA Projectile Defect Classification.

a. Projectiles, 155mm, M549, HERA (1320-D579) and Projectile 8-Inch, HERA, M650 (1320-D624) with missing or damaged obturating bands can cause a critically short round.

A missing or damaged band evidencing an obvious crack, cut or gouge extending across entire width of band is to be classified as a critical defect. This damage is to be distinguished from incidental cracks or scratches that do not affect obturator functioning.

A "loose" obturator band is a critical defect if the band will not remain in the groove. If band can be manually removed from groove, but can also be "snapped" back into groove, round is to be considered serviceable.

Circumferential movement of obturator is not classified as a defect.

b. Excessive gap between warhead and motor body assembly is a critical defect for 155MM, M549A1 (1320-D579) and 8-Inch, M650 (1320-D624) projectiles due to potential for motor separation. Gap criteria is as follows:

A 0.0075-inch feeler gage shall not enter joint at any point.

A 0.0035 inch feeler gage may enter joint by more than one-eighth inch on any one 30 degree segment of joint, however, it may not enter by more than one-eighth inch on the remaining 330 degree segment.

c. Gap greater than 0.010 inches at any point between forward and aft warhead assembly of the 8-inch, M650 is a major defect.

d. Age and storage environment related deterioration causes 155MM, M549A1 projectile obturators to become excessively brittle especially in hot dry climates. Ductility will likely partially return if subsequently stored in a humid climate.

D-16. Items Belonging to Other Services.

Most conventional ammunition items belonging to other services and stored at CONUS installations by the Army will be inspected and tested in accordance with DOD 5160.65-M, Joint Conventional Ammunition Quality Assurance Policies and Procedures.

a. Ammunition Surveillance Division, Rock Island is the focal point for QA matters concerning SMCA field service stocks.

b. Munitions stored for other government agencies not covered by SMCA or private contractors are subject (as a minimum) to a receipt inspection and safety-in-storage inspections.

c. Additional inspection procedures and their frequencies will be specific in the appropriate support agreement or memorandum with the owner. This includes, but is not necessarily limited to, foreign, experimental, and test ammunition.

D-17. Items That Have Not Been Hazard Classified.

a. Items, that have not received a hazard classification IAW TB 700-2, must be considered Hazard Class/Division 1.1 Compatibility Group L for storage.

b. These items cannot be cleared for shipment except that captured military ammunition of unknown characteristics can be shipped by military air from one military airfield to another military airfield. These items can be moved about on a military installation except as above.

c. Item hazard classification must be requested from Director, U.S. Army Technical Center for Explosives Safety (USATCES) IAW the procedures of TB 700-2.

d. The primary source for determination of item hazard classification data is the Joint Hazard Classification System available on the World Wide Web reference paragraph 1-5.d.(21)(d).

D-18. Marker, Location Marine, MK25 (1370-L554).

a. The Air Force Technical Order covering this item (T.O. 11A-1-60) contains a warning to inspectors that any residual red phosphorous in an expended or partially expended L554 item is subject to spontaneous re-ignition upon exposure to air. These expended or partially expended Mk 25 Marine Location Markers are considered an environmentally hazardous material.

b. Inspectors are reminded to include this item and warning in local standing operating procedures (SOP's) dealing with inspections of residue, to ensure complete compliance with paragraph 2-4b(4)(c) of this SB.

D-19. Mine, Antipersonnel, M18 Series.

a. Inspect the electric blasting cap assembly M4 using test procedures in TM 9-1345-203-12&P, paragraph 2-3, and the following:

Unpack the electric blasting cap assembly M4 and inspect to insure that shorting plug/dust cover on M4 electric blasting cap assembly is present and properly closed. A missing or improperly closed combination shorting plug/dust cover is considered a critical defect.

Unroll the electric firing wire and visually inspect for defects such as cracks or peeling of the insulation material (also see paragraph D-5).

Test with the M40 test set according to TM 9-1345-203-12&P, paragraph 2-3d(9) (a) through (f) and reroll the firing wire on the spool.

WARNING

The M4 blasting cap assembly contains an M6 electric blasting cap. Personnel must be shielded from the effects of accidental initiation of the cap.

Electrical continuity test failure and damage or deterioration to the insulation material that results in a bare wire exposure liable to cause failure are classified as major defects (see paragraph D-5 for criteria).

b. Inspect mines for deterioration of plastic body.

Plastic cases on mine, APERS, M18A1 (1345-K143 and K145) manufactured before 12/89 may become soft and sticky, causing difficulty extracting the mine from the cloth bandoleer (minor defect). Only back side of the mine affected. Deterioration of the plastic case does not affect functioning. Chemical reaction between explosive and polystyrene component of the plastic causes the deterioration.

Mines with exposed explosives should be transferred to condition code Hotel and disposed of in accordance with DA PAM 750-8.

Transfer wholesale stocks with deteriorated plastic case (w/o exposed explosive) to condition code "F" and do not ship to retail installations until renovated IAW DMWR 9-1345-0000-F21. Use retail stocks with deterioration of plastic cases (w/o exposed explosives) for all purposes and retain in basic load. Cut mine from bandoleers if use is required due to operational necessity and if attempt to extract the mine will not expose explosive. Limit cut to minimum required to extract mine from bandoleer.

D-20. Mine, AT, HE, M15.

a. Inspection of the M603 fuze packed with this mine is necessary to ensure that a detonator is present. Absence of this detonator could indicate that the inert fuze used with the practice mine M7A2 had been inadvertently assembled to the M15. Inspection for presence of the detonator is accomplished as follows:

Assure that safety clip is in place between pressure plate and body of fuze.

Turn the fuze over and assure that varnished or painted lining compound on end of detonator shows in bottom of fuze.

Absence of the detonator is classified as a major defect.

b. Inspect the mine Belleville spring for deterioration or improper assembly (major defect).

Test the resistance of the mine pressure plate by applying hand pressure to the unfuzed mine pressure plate. The amount of force applied (5 to 25-lbs is suggested) should not exceed approximately 50-lbs. If no movement of the pressure plate is detected, the Belleville spring is considered serviceable.

Remove the arming plug and visually examine the Belleville spring for deterioration, misalignment, or improper assembly (use of a flashlight will be required). Verify that the setting knob of the arming plug is properly assembled (see drawing #C37-1-7 and TM 9-1345-203-12&P). Arming plugs failing to meet this requirement will be classified as critical defectives. (Improperly assembled units allow the plug to be armed while the arrow is pointed toward the "safe" position.)

Examine the fuze retainer spring in the arming plug for deterioration or misalignment (major defect).

D-21. Mine, AT Heavy M19 Non-Metallic.

a. Inspect the mine for damage (cracked/dented body) IAW TM 9-1345-203-34, and ensure the mine's firing pin is "SAFE" by performing the following steps:

(1) Remove fuze and inspect rubber gasket

(2) Remove any foreign material found in fuze well.

(3) Verify fuze is set to "S" and safety clip is in place.

(4) Remove shipping plug from detonator well and remove any foreign material.

(5) Verify the firing pin is located at the edge of the detonator well.

(6) Remove safety clip and rotate fuze setting knob to "A"; verify that the firing pin moves to the center of the detonator well.

(7) Return setting knob back to the "S" position; verify the firing pin returns to the side of the detonator well (critical defect if firing pin does not return).

(8) Replace safety clip.

b. Functional characteristics per TM 43-0001-36 indicate a force of 300 to 500 pounds applied to the pressure plate will cause mine detonation. Testing has shown that mines may function below the 300 pound lower limit. The lowest functional force recorded from one lot during testing was 198.5 pounds. On average, mine lots can be expected to function between 260 and 500 pounds.

c. When installing/emplacing/or removing the K250 mines users are advised to adhere to established procedures, and to be aware of the mine's lower functioning force.

D-22. Permanent Suspension Of Material In SMCA Managed Accounts.

a. Permanent suspension action pertains only to assets of the service issuing the suspension. This appendix pertains only to assets suspended by the issuing service that are in or are transferred into the SMCA (Army) Demil Accounts (B5A or local accounts).

b. Non-SMCA ammunition, e.g. Navy torpedoes, Air Force missiles, will be conditioned coded in accordance with permanent suspension actions of the developing service, regardless of owner account.

c. For all other SMCA managed items, JMC Surveillance Division will issue a NAR indicating the disposition of stocks in Army accounts for each permanent suspension action issued by other services. An "X" in the Army column in SMCA list identifies items with Army use.

D-23. Projectile Receipt Inspection.

a. Projectiles, 8-Inch, M106 (1320-D680) with NPK metal parts are suspended, requiring ultrasonic test and assembly of ogive protector (OPA) and shock attenuating lifting plug. These projectiles have proven extraordinarily susceptible to developing cracks (due to residual stress) when subjected to impacts. Avoid striking projectile ogive area since any hard impact may cause projectile ogive to crack especially at cold temperature. Projectiles may be transported without special precautions as long as they remain palletized IAW approved drawings.

Lots which have been ultrasonically tested (100%) for presence of cracks in area of ogive may be

distinguished from other M106 projectiles by presence of polyethylene truncated cone (ogive protector assembly) assembled to ogive and shock attenuating lifting plug assembled to fuze well.

Unit returns of projectiles, which have indication of rough handling, are to be classified as unserviceable requiring ultrasonic screening. Projectiles, which have broken shock attenuating lifting plugs, are not repairable.

Field service returns are to be classified unserviceable, requiring ultrasonic screening unless it can be determined with reasonable certainty that ogive protector and lifting plug have not been removed by troops.

b. Any projectile that is known or suspected of having been rammed into a howitzer weapon is to be placed in CC-H and authorized for demilitarization. Howitzer user's manuals caution howitzer crews not to load a previously rammed projectile into a weapon. One exception is Copperhead projectiles when rammed into a cold tube.

D-24. Projectile 155mm, Illuminating, M485 Series (1320-D505) and Projectile 155mm, Infrared Illuminating, XM1066 (1320-DA49).

a. Projectiles missing a groove pin in base (located approximately ¾" up from base of projectile) may cause premature functioning of the round (critical defect).

(1) Surveillance inspections for missing groove pins in the base of the projectile is to be conducted visually and by inserting an appropriately sized probe (approximately 1/8" diameter tip, such as the tip of a ball point pen or a carpenter's nail) into the three (3) holes to verify the presence of each pin, as paint may be covering a hole that is missing a pin.

(2) Pins should be flush or near flush to the surface of the shell body.

(3) M485A2 only: due to possible rework during production, some M485A2 projectiles may exhibit as many as six (6) extra pin holes. Extra holes with pins inserted are not to be considered a defect. Any pin hole without a pin is a critical defect.

b. Defects found during inspection of the expelling charge will be classified as follows:

(1) Bulged (incidental defect).

(2) Cracks without exposure of contents (incidental defect).

(3) Split, cracked, torn, or burst with contents exposed (major defect).

(4) Cover separated with contents exposed (major defect).

(5) If during the course of the surveillance inspection, stuck expelling charges are encountered with no exposed black powder or moisture on top of the visible expelling charge or in the fuze well, additional samples equal only to the number of stuck charges are to be selected. If these samples evidence no black powder contamination or moisture, the lot is to be accepted for unrestricted issue and use.

(6) If stuck expelling charges exhibit cracks with exposed contents and/or moisture, they are to be treated as major defects, the lot condition coded accordingly, and reported in accordance DA Pam 750-8.

Loose components, indicated by rattling inside the projectile during handling, is not a safety concern. Rattling is caused by looseness of spacers inserted in the base of projectiles and in the canister assembly during loading and packing to assure a tight pack. However, loose-pack of the cargo has been proven to contribute to fuze failures, resulting in duds and overall decrease in reliability of the round.

D-25. Projectile, 155mm, M825 Series Defect Classification.

a. Projectile, 155MM, M825/M825A1 WP (1320-D528) with missing or damaged obturating bands can cause a critically short round.

A missing or damaged band evidencing a crack, cut or gouge extending across entire width of band is to be classified as a critical defect.

A "loose" obturator band is a critical defect if the band will not remain in the groove. If band can be manually removed from groove, but can also be "snapped" back into groove, round is to be considered serviceable.

Circumferential movement of obturator is not classified as a defect.

b. Canister component lot numbers have been stenciled on each projectile. This is not a defect but makes end item lot identification more difficult. Item drawings provide correct location for projectile lot number.

c. Corrosion on aluminum portion of M825 projectile base is a critical defect. Procedure for conduct of inspection and defect classification criteria is same as that for M483A1 projectiles with old type "green" bases (see Appendix N). Steel portion of M825 projectile base is that portion from base/body joint extending rearward for one-fourth inch. Damage to protective coating should be repaired using M825 projectile drawings, provided there is no corrosion present.

d. M825 projectiles may rattle or exhibit other internal noise when nose is tipped or shaken. This condition is common due to slight looseness of components and does not affect safety, firing or end item performance.

D-26. Projectile, 8 inch, M404.

a. Inspection of 8-inch M404 projectiles will include inspection of expulsion charge bags. Bags may be made of 2-mil low-density polyethylene film that is known to deteriorate over time due to environmental stress cracking. Emphasis should also be placed on condition of lifting plug gaskets.

b. Any crack or tear in an expulsion charge bag is a major defect if moisture can enter or propellant escape. Deterioration or damage to lifting plug gaskets to an extent, which would permit entry of moisture, is also a major defect.

c. Expulsion charge covers can be removed using a spark proof tool. Following inspection, cover edges are to be snapped back under the stake marks in the cup using finger pressure.

D-27. Rocket, 66mm Incendiary, M74, TPA (1340-H110).

a. Evidence of grayish/white residue on round/ warhead could in fact be an oxidation product from the triethyl aluminum, but could also be residue from excessive epoxy sealant used to secure fill plug.

b. If grayish/white residue is found on warhead, perform the following test:

WARNING

Hydrochloric acid is corrosive and should be handled with care. If acid contacts skin, it should be immediately flushed with water and/or sodium bicarbonate solution (baking soda and water).

Test solution is hydrochloric acid. Dilute concentrated hydrochloric acid (commercial muriatic acid or 12n laboratory acid) with an equal volume of water to give approximately 6n hydrochloric acid. Test solution should be poured into a dropper bottle for use. This solution should be obtained from the medical officer, post hospital, laboratory or pharmacy.

Neutralizing/cleanup solution is a saturated solution of sodium bicarbonate (baking soda) in water. Mix the baking soda into a container of water until no more dissolves.

Place 2-4 drops of acid solution directly on powder on warhead or on powder scraped off warhead into a plastic or ceramic container (dish). If residue is oxidation product from triethyl aluminum, it should dissolve away. Follow procedures of reference directing clip be submerged in oil, and report as a critical defect.

Residue, which is epoxy sealant, will not be affected by the acid solution.

After each test, acid wetted area should be neutralized by wiping with a rag wet with bicarbonate solution in paragraph 5b.

D-28. NSNs for Electrostatic Packing Material.

MIL-PRF-81705 ELECTROSTATIC PROTECTIVE BARRIER MATERIAL		
NSN	TYPE	SIZE
8135-01-185-6816	Type I	36 inches X 150 ft roll
POLYETHYLENE BAG WITH INTERLOCKING SEAL CLOSURE		
NSN		SIZE
8105-00-837-7756		10 inches wide X 10 inches length
8105-00-837-7757		12 inches wide X 12 inches length

D-29. Identification Of Ammunition Stored In Southwest Asia (SWA) During Desert Storm/Desert Shield.

a. Material that was on the ground in Southwest Asia (SWA) during Desert Storm/Desert Shield is identified by the lot type designator code "Y". The use of this "Y" identifier does not apply to ammunition materiel used during Enduring Freedom/Iraq Freedom.

b. IAW MIL-STD-1168, the lot type identifier code is to be found in the tenth position of the lot number. For example, ammunition lot LOW89C003-002 becomes ammunition lot LOW89C003Y002. The "Y" will replace any previous lot type identifier. For example, lot number LC-85D002L004 becomes lot number LC-85D002Y004. It is imperative to include a remark in the DSR and ADC that identifies the previous type of lot identifier code that the "Y" replaced. See TB 9-1300-385 introduction for additional information. Navy/Marine Corps AIN 030-2001 will apply to Single Managed items owned and used exclusively by the U.S. Navy or U.S. Marine Corps.

c. For older type lot numbers, the "Y" should be added at the end of the lot number preceded by a dash to allow for a lot suffix. For example, lot LS-23-5 becomes lot LS-23-5-Y: a suffixed lot : lot number LOP-1-2A becomes lot number LOP-1-2AY.

d. For new format propellant lot numbers with the 0 (zero) in the 8th position: "Y" will be placed in the 8th position. For example, IND88A-070804 becomes IND88A-Y70804. For new propellant lot numbers with alpha character in the 8th position" "Y" will replace any previous lot identifier. For example, IND88A-G70804 becomes IND88A-Y70804. It is imperative to include a remark in the DSR and ADC that identifies the previous type of lot identifier code that the "Y" replaced. For old format propellant lot numbers: "Y" should be added at the end of the lot number preceded by a dash to allow for a lot suffix. For example, RAD-65268 becomes RAD-65268-Y; IND-BR-66007 would become IND-BR-66007-Y; a suffixed lot: lot number RAD-65268A becomes RAD-65268AY.

e. An ADC with the "Y" indicator need not be established solely to reflect the SWA status. An ADC will be established when a SWA lot undergoes rework that requires a lot suffix. Two separate ADC's will be initiated if part of the lot was in SWA and part was not. The "Y" identifier will be applied only to that portion of the lot that was in SWA during Desert Storm/Desert Shield. The two lot segments should be run and palletized separately to assure that the segments do not become mixed.

f. Prior to any rework which formally establishes the "Y" ammunition lot number, administrative methods will be used to establish and maintain identification of SWA stocks. As a minimum, the "Y" will be added to unit loads. All stock records, such as SDS lot files, magazine data cards, and shipping documents will include the "Y" identifier. Separate DSR's will be established for SWA lots. The "Y" will be added as subsequent lower levels of packs are exposed. For example, if a pallet is broken down, the individual outer packs will have the "Y" added; if an outer pack is opened, the inner pack will be marked. DSR's will

include a remark indicating what level of pack "Y" has been marked on the ammunition.

g. Energetic material removed from ammunition with a "Y" identifier must have the "Y" identifier added to lot number and outer packs. Physical application of the "Y" identifier will be IAW the above paragraph e. Assure DSR for energetic lots state they were stored in SWA. The outer pack marking of the "Y" identifier is not required on energetics removed from end items prior to publication of AIN 99-98, 30 October 98. However, a placard board or some other positive means of identification must be used to maintain the SWA identity of this material. Special attention should be paid to subject energetics in demil accounts and during safety in storage inspections.

D-30. Cartridge 105mm HE M1 (1315-C445); Projectile 155mm HE M795 (1320-D529); Projectile 155mm HE M107 (1320-D544).

a. A small percentage of projectiles have been shipped from loading plants with small amounts of explosive contamination on their exterior. The small amount of explosive, or exudates, are unwanted but pose no significant safety hazard. Visual inspection for explosive or exudates residue on the threads or exterior of the projectile has always been a requirement for visual inspection. It is not feasible to place objective limits on this visual inspection. A degree of interpretation is necessary to account for the subjectivity of the inspector and has been a part of the normal inspection process at ammunition plants for decades. The visual inspection requirements for explosives in the threads or on the exterior of the projectile are not intended to detect trace amounts of explosive. They are also not intended to require the use of chemical reagents, such as Webster's reagent, to verify these requirements since most explosive items will test positive due to the nature of the loading process. Load plants have had the responsibility for these inspections for many years and have performed safe assembly and delivery of numerous high explosive items.

b. The following definitions are provided for inspection purposes:

(1) Explosive stain: a discoloration of the paint that has no visible explosive residue present. Stains are not acceptable at the LAP plant but are not a reason for non-acceptance at the depot.

(2) TNT bloom: TNT bloom (frost, needles, dust) is a light fine crystalline particulate that can be present on the coatings of metal lattices of the steel projectiles as a result of the melt pour loading process. Bloom represents a minute quantity of material and is not a safety hazard. Bloom will have a white 'frosted' appearance and will sparkle when viewed with a light source in a dark environment. When wiped with a solvent, bloom seems to come off easily with no visible residue but may reappear after the solvent has evaporated. Bloom is not a reason for non-acceptance at the depot.

(3) Raw TNT: raw TNT 'cake' or residue is tan or beige in color and is deposited on the projectile surface via a drip, splatter or other means. Raw caked TNT on the exterior of the projectile is not permissible in accordance with LAP specification. TNT cake or residue will have a 'bump' that can be felt as opposed to bloom that cannot be felt.

c. Photos describing 'explosive stain', 'TNT bloom', and 'raw TNT' are available for viewing in MHP under 'Notices- AIN report'.

D-31. Simulator, Pyrotechnic, Main Tank Gun M30 (1370-LA06), Simulator, Pyrotechnic, Direct/Indirect Fire Cue (DIFCUE) M31A1 (1370-LA07).

a. Units drawing/using subject DODACs have reported that, when individual rounds are functioned, the resulting smoke and heat have caused discoloration of simulators positioned near the functioned item in the firing device. Items which have been loaded in the firing device but which the unit has not attempted to fire have been subsequently turned in with light to severe blackening of the simulator cap or body. Questions have arisen regarding the effect of this exposure on the external and internal serviceability of these unfired items.

b. The following defect criteria are to be used in evaluating the serviceability of items from subject DODACs returned from the field:

(1) Critical:

-Powder evident on outside of unit.

-Body ruptured or opened.

-Cap missing or ruptured.

-Contact pins missing.

(2) Major:

-Body damaged (deformed, cracked, warped, or visibly subjected to stress or bulging).

-Body or cap blackened or discolored by burn marks or scorching.

-Cap not secured to body.

-Cap damaged (deformed, cracked, warped, or visibly subjected to stress).

-Contact pins loose or extended.

-Retaining tabs missing or damaged.

(3) Minor:

-Item covered with foreign material, i.e. soot, dirt, or grime.

-Model or lot number markings illegible, misleading or unidentifiable.

c. Discoloration from burn marks or scorching can be distinguished from foreign material, i.e. soot, dirt, or grime, by inability to remove burn marks or scorching by wiping item with a rag.

D-32. Smoke Pot, Floating, HC, M4A2 (1365-K867).

The following visual defect criteria are to be used in evaluating the serviceability of the K867 Smoke Pot:

a. Critical:

Fuze type incorrect (only E14 or M207A1 fuze authorized).

b. Major:

(1) Advanced rust or corrosion (rust scale or pitting) of exterior surfaces.

(2) Body with dents on crimped edges exposing filler.

(3) Body with dents on surface exposing filler.

(4) Tape covering emission hole missing, loose, or damaged.

(5) Fuze with major damage.

(6) Fuze with major corrosion.

(7) Marking incorrect.

c. Minor:

(1) Protective coating inadequate (25% or more of total surface coating blistered, peeled, or missing).

(2) Marking illegible or missing.

(3) Light corrosion not affecting serviceability (no pitting or rust scale permitted).

(4) Outer cover ring clamp damaged.

(5) Outer cover handle inoperative.

(6) Inner cover handle inoperative.

(7) Fuze chain and pull ring damaged or missing.

(8) Body with dents on crimped edges but not exposing filler.

(9) Body with dents on surface deeper than ¼ inch but not exposing filler.

APPENDIX E
SMALL ARMS CARTRIDGES THROUGH CALIBER .50

E-1. Item Description.

a. FSC: 1305.

b. Ammunition Type: Small arms cartridges through caliber .50 to include plastic and short range training ammunition (SRTA), close combat mission capability kit (CCMCK) marking ammunition, and the .30 Caliber, M2 AP Test Parts Kit.

c. The small arms family of cartridges (through caliber .50) are those which are complete assemblies (except as noted in paragraph E-1.d below) consisting of all components necessary to fire a weapon (i.e., cartridge case, primer, propellant and bullet or shot). For a complete description of various cartridges, see TM 43-0001-27 and applicable drawings.

d. The .30 Caliber, M2 AP Armor Test Parts Kit, Ammunition (DODAC 1305-AB68) consists of a M2 AP projectile and a separate primed case that will be used specifically for testing various types of armor.

E-2. Unique Safety Precautions.

a. Reasonable care will be taken during inspection and handling. SAA may function if the primer is inadvertently struck.

b. To preclude the mixing and issue of other types of SAA with blank ammunition, the following minimum precautions will be taken:

(1) Conduct no operations involving other types of SAA in bays or rooms in which operations involving blank SAA are being conducted.

(2) Inspect all equipment and work areas prior to use to insure service rounds are not present.

(3) Restrict use of all involved equipment to blank SAA until the operation is completed.

(4) Incorporate controls on linking machines that will prevent entry of all rounds except blank ammunition.

(5) Conduct a 100-percent visual inspection of all rounds prior to linking, clipping or carton packing and another 100-percent inspection before final packing to assure that only blank ammunition has been linked/clipped or packed in cartons.

c. Restrictive marking stenciled on the exterior container of SAA.

(1) Prior to 1976, it was common for Frankford Arsenal to instruct the manufacturers of SAA to stencil the exterior containers of restricted ammunition prior to containers leaving the manufacturing facility. The restrictions were not forwarded to higher headquarters for inclusion in TB 9-1300-385.

(2) There is no available record of the lots with restrictions stenciled on boxes and it is not anticipated that an attempt will be made to list these restricted SAA lots in TB 9-1300-385.

(3) Restrictions stenciled on boxes of SAA are considered valid and all ammunition lots so marked should be issued and used according to these restrictions.

d. SAA for overhead fire.

(1) SAA intended for overhead fire is manufactured to different, more stringent specifications and is identified by NSN, not by lot number.

(2) Only SAA identified for overhead fire in FED LOG, TM 43-0001-27 or Ammunition Data Cards (A151, A166, A167) may be used for that purpose.

(3) AR 385-63, Policy and Procedures for Firing Ammunition for Training, Target Practice and Combat, states that units intending to use ammunition lots for overhead fire must have lots approved for such use. This guidance does not apply to SAA.

e. Class V materiel supplied to non-SMCA customers. Shipment or transfer of accountability of caliber .22, shotgun shells and blank small arms ammunition to non-SMCA customers does not require a functional clearance.

E-3. Testing and Equipment Requirements.

a. Profile and alignment gaging and pull and twist tests will be performed during IRI per paragraph 2-8, applicable drawings, and applicable specifications. Pull and twist tests will also be performed during subsequent cyclic and receipt inspections.

b. Test cartridge according to Table E-1:

Table E-1. Gaging Requirements

Model	IRI	RI	PI	UBLI
All SAA	A,B,C	B,C,D	B,C,D	B,C,D

Legend:

WARNING: when performing profile and alignment gage operations, use extreme care to not apply pressure on the primer.

A - Profile and alignment gage (gaging required only for Logistic Control Code (LCC) A and B items).

(1) Cartridge .50 cal – if the cartridge fails to gage using only finger pressure, the inspector will utilize APE 1999, Pressure Tester for the .50 cal Profile Alignment Gage.

(a) The APE 1999 allows the inspector to ensure insertion pressure does not exceed 80 lbs when gaging.

(b) Use care during removal of the cartridge and inspect cartridge and the profile alignment gage for damage after applying pressure with APE 1999. If the lot fails gaging, report deficiency to JMC per paragraph 2-8i, and provide comment on the quantity of .50 cal rounds that failed after applying 80 lbs of pressure using the APE 1999 Pressure Tester.

(c) Submit requests for APE 1999 and/or APE 1999 documentation to AMSJM-LID, APE and Demilitarization Management Division (see paragraph 1-5d(20(e)). No profile and alignment gages are available for the CCMCK 5.56mm or 9mm assets.

B - Pull test. (See Table E-5 for specific pull requirements.)

C - Twist test. (See MIL-STD-644 for specific procedures.)

D - Profile and alignment gaging required only if not accomplished during IRI, or if round is visibly damaged. Lot will not be rejected if damaged round fails to gage. Gage failures will be reported IAW requirements of basic SB. (Profile and alignment gaging is required only one time during life cycle of lot.)

c. Table E-2 identifies test and measuring equipment:

Table E-2. Equipment Identification List Using Gage, Profile and Alignment

Caliber	NSN	Part Number	Model
5.56mm	5220-00-949-8607	8654100	L2A2 L5A3 M193 M195 M196 M199A1 M200 M855 M855A1 M856 M995 M996
7.62mm	5220-00-119-0873	8648501	L13A1 M59 M61 M62 M63A1 M64 M80 M82 M82A1 M118 M160 M276 M852 M993
.30 cal	5220-00-119-0871	8648308	M1 M2 M14 M25 M72 M1909
.30 cal Carbine	5220-00-119-0872	8648580	M1 M27
9mm	5220-01-285-6426	8649470	M882 M917A1
.38 cal	5220-00-119-0868	8651500	M41
.45 cal	5220-00-119-0869	8648570	M1 M9 M26 M1911 M1921
.50 cal API API-DT API-T Ball Blank Dummy Inc Sabot Tracer	5220-00-119-0870	8648301	M1 M2 MK257 M2A1 M8 M9 M17 M20 M23 M33 M903 M962 MK211
.50 cal Spotter-Tracer Practice	5220-00-119-0874	8648316	M48A2 T249E2
Gage, Receiver Profile and ALI .300 Win Mag	5220-01-615-7795	13047019	MK248 MOD 0

E-4. Inspection Category and Sampling Plan.

a. Inspection categories:

(1) Category R (ten years) for items packed in steel cans with gaskets (includes inert items)

(2) Category W (five years) for items not packed in steel cans with gaskets (includes inert items); and for Marking Ammunition (CCMCK).

b. Table 2-3 will be used to determine sampling plan for SAA.

c. Samples of small arms ammunition packed in metal (terneplate) lined M1917 boxes will be used on a recurring basis. Terneplate lids will be resealed by means of three wraps of plastic film secured with Pressure Sensitive and Filament Reinforced Adhesive Tape (MIL-T-43036). A pull-tab is also required for easy removal of the tape. Boxes will be identified (stenciled or tagged) as “Surveillance samples, not to be shipped”. In the event that the entire lot is scheduled for shipment, remove the “not to be shipped” statement.

E-5. Specific Inspection Points.

a. Specific inspection points are in Table E-3. Item will be inspected and classified according to this table.

b. Refer to MIL-STD-644 and basic portion of this SB for inspection of packaging and marking.

Table E-3. Item Defects

	Critical	Major	Minor	Notes
1. Complete Round:				
a. Discolored, dirty, oil smeared.			X	6
b. Corroded or stained, if etched.		X		
c. Cartridge profile gaging failure.		X		3
2. Cartridge Case:				
a. Round head.		X		
b. Dent.				2
c. Split Case.	X			1
d. Split Case.		X		1
e. Perforated case.	X			
f. Draw scratch.				2
g. Scratch.			X	
h. Beveled underside of head.		X		
i. Case mouth not crimped in cannelure.		X		
j. Scaly metal.				2
k. No chamfer on head rim.		X		
l. Fold.			X	7
m. Wrinkle.			X	
n. Buckle.			X	
o. Bulge.			X	
p. Illegible or missing head stamp.			X	
q. Defective head.			X	
r. Defective mouth.			X	
s. No visible evidence of mouth anneal.		X		
3. Bullet (Note 4):				
a. Dent.			X	
b. Scratch.			X	
c. Split bullet jacket.		X		
d. Loose bullet.	X	X		5
e. Missing cannelure.		X		
f. Scaly metal bullet.				2
g. Upset (crooked) point.			X	
h. Exposed steel (clad jacket).			X	
i. Blunt point.			X	
j. Defective cannelure.			X	
4. Primer:				
a. No primer.		X		
b. Cocked primer.		X		
c. Inverted primer.		X		
d. Loose primer.		X		
e. No waterproofing material (primer pocket joint).			X	
f. Defective crimp.			X	
g. Nicked or dented primer.				2

Notes:
1. Refer to MIL-STD-636 for position locations.
2. Classify per MIL-STD-636.
3. See paragraph E-3.
4. See paragraph E-6i.
5. Critical defect applies if the exposed steel penetrator is loose enough to permit side-to-side movement or can be pulled out of the bullet jacket for DODICs AB56, AB57, AB58 (M855A1 5.56mm Enhanced Performance Round). See paragraph E-6k.
6. See paragraph E-6l for white powder on DODIC A518.
7. Classify .50 cal fold criteria the same as 7.62mm per MIL-STD-636.

E-6. Additional Guidance for SAA.

a. Small caliber stockpile reliability program (SCSRP) and centralized trace test program (CTTP) for SAA.

(1) Refer to basic portion of this SB for selecting and preparing for shipment lots nominated for SCSRP and CTTP.

(2) Trace Function Test Report, DA Form 3524-R with part 1 completed, is required only for tracer bearing SCSRP/CTTP candidate lots shipped to test facilities. DA Form 3524-R should be forwarded to designated facility by transmittal record (DA Form 200) for verification of receipt. Assure that all component lot data is listed for functional lots (ratio packed).

(3) Surveillance trace test of SAA will be performed as directed by JMC according to SB 742-1305-94-20.

b. Conglomerate lots of SAA.

(1) Individual lot quantities of SAA of less than a standard exterior pack will be accumulated for conglomeration only when directed by the commodity command. The commodity command will notify AMC storage activities and overseas command of items authorized for conglomeration. Unless otherwise notified, less than a standard pack will be assigned condition code P except as noted below.

(a) Calibers .22, .32, .38, 9mm, and .45, shotgun shells, rifle grenade cartridges, high pressure test items, caliber .50 spotter-tracer and dummy cartridges.

(b) Listed items will be maintained in stock by individual lot number regardless of lot size.

(2) When authorized, lots will be conglomerated by caliber, type, manufacturer and functional code. A local control number will be assigned and will consist of depot symbol, sequence and year established, e.g., TOD-1-86. A local record will be maintained of the individual component lots and related quantities which comprise conglomerated control numbers. Each box containing conglomerate stocks will have a card affixed to the interior, listing individual lots and quantities.

(3) Individual lots of SAA in a potential conglomerate stockpile need not be delinked or declipped prior to receipt of disposition instructions. Lots will be maintained by individual lot number, functional code, model number and caliber. Various models of tracer within one caliber, whether serviceable or deteriorated, may be placed into one conglomerate lot.

(4) Quantities will be accumulated and carried on record as usable assets under the appropriate condition code. Quantities of 50,000 and over of the same model and caliber will be reported on DA Form 2415 (Ammunition Condition Report) according to DA PAM 750-8 for disposition instructions.

(5) If relinking is authorized, only cartridges from one producer per type (regardless of year of manufacture) will be utilized in a belt of linked ammunition. A maximum of 100,000 cartridges will be packed as a lot. Lot number assignment will be according to MIL-STD-1168. Data cards will be prepared and distributed according to MIL-STD-1168 and data item description DI MISC 80043.

(6) Conglomerate lots will be inspected for serviceability at the same interval as other category V items i.e., seven years. Sample size will also be the same.

(7) Packed lots will be identified by DODIC and nomenclature furnished by JMC.

(8) Repackaging instructions will also be provided by JMC.

c. SAA with lost lot identity.

(1) All SAA with lost lot identity (excluding commercially procured items such as caliber .22) will be picked up on accountable records in condition code K pending inspection and classification. Ammunition determined by inspection to be serviceable will be assigned condition code B for training use only in hand weapons (rifle, pistol or shotgun) or ground and vehicle mounted machine guns. These rounds are also authorized for emergency combat use.

(2) Serviceable caliber .50 ammunition with lost lot identity can be used in the M85 machine gun for training provided that:

(a) M15A2 links which are suspected or known to have been previously cycled in M85 machine gun are not used. M15A2 link is designed for one time use.

(b) Field returns of loose rounds that were not linked in M15A2 links for use in M85 machine gun will not be issued for use in the M85 machine gun. Ammunition suitable for use in M85 is limited to assets known to be originally assembled with M15A2 link, and is limited to relinking of partial belts to standard pack configuration.

(3) SAA with lost lot identity is prohibited from use for overhead fire and qualification exercises.

(4) Munitions and configuration components (links, clip, etc.) will be segregated by caliber, type and model designation. A 100-percent visual inspection and classification of rounds and components will be made to include performance of required testing, where applicable, according to MIL-STDs, drawings and provisions of this appendix. Links which have been cycled through weapons will not be reused.

(5) Serviceable munitions will be assigned a local lot number consisting of a three digit activity symbol, lot sequence number, identification code "U" (unknown) and year established, e.g., BAP-3U-80.

(6) Level of pack will depend on the local situation. As a minimum, preservation and packaging will be accomplished to assure adequate security, provide transportation safety and allow expected field handling by the user. In addition to standard markings, packaging will be identified by local lot number and training use marking, e.g., DAP-3U-80, training use.

(7) Records and reports. DSR's and accountable records will be maintained using the local

lot number. Malfunction reports, WARS report, input, etc., on these munitions will be made in a usual manner using the local lot number. Ammunition Data Cards are not required for these lots.

(8) CONUS posts, camps or stations without adequate personnel and facilities to perform inspection and processing of SAA will report through command channels to JMC according to DA PAM 750-8 for disposition.

d. Repack of small caliber ammunition. The following criteria is to be used when repacking stocks of ammunition through caliber .50 to different configurations:

(1) All lots must be certified for use in the weapon(s) for which they are being repackaged. Certification for each lot will be obtained by furnishing a list of component lots to the office in paragraph 1-5d(1). Request for lot certification will indicate date repack is to start, designate the NSN to which ammunition will be repacked, and must be received by JMC at least three months before the operation is scheduled to begin. Lots not certified for use in weapons for which repack is being accomplished will require testing. Tests will be arranged by the office in paragraph 1-5d(1) upon request.

(2) Serviceability criteria.

(a) Ammunition will meet the visual inspection criteria specified by the appropriate Military Standard.

(b) Restricted or suspended ammunition will not be used in repack operations without specific authorization or instructions from the commodity command.

(3) Lot formation criteria.

(a) Functional lots must meet the requirements of appropriate military standards, specifications and drawings. The latest revision must be used unless otherwise directed by the commodity command. Small caliber ammunition assembled in metal link belts will be tested and inspected 100-percent according to the appropriate portion of MIL-STD-644, paragraph 5.1.6.

(b) No more than one lot of each component will be used in a functional lot.

(c) Functional lots will consist of a minimum of 30,000 rounds, unless otherwise specified by the commodity command. The maximum lot size will be controlled by the size of the major component (Ball, AP, API, etc.).

(d) When directed by the commodity command, hybrid lots may be authorized. In such cases, up to five major component lots and two minor component (tracer) lots may be used so long as each component displays the head stamp from one manufacture (i.e., all ball, all AP, all tracer, etc., have the same manufacturer). Year of manufacture may be disregarded. If two tracer lots are used, there must not be a variance of over 10-percent in any element of their tracer test (satisfactory, blind, specification trace) results. Hybrid lots will not exceed 250,000 rounds.

(e) Linked ammunition consisting of two or more types of cartridges packed in an authorized combination. An "L" will be used in the lot number to indicate functional pack. In some cases SAA will qualify for two identifier codes in place of a hyphen in the lot number (reference MIL-STD-1168). In those cases where the functional pack identifier "L" conflicts with another identifier code, the "L" will be dropped and the other code will be used.

(f) Dummy small arms ammunition.

1. Inspect dummy cartridges for such defects as damaged extractor groove/rim, damage which may preclude use, corrosion, and loose projectiles which would cause the round to fail to gage.

2. Dummy cartridges with defects other than those specified above will be considered serviceable as long as the defects do not preclude use and cartridges can be identified as dummy.

3. In 2009, an initiative to positively identify Dummy, Drilled and Inert (DDI) small arms ammunition was undertaken. This included nickel plating and fluting 5.56mm, 7.62mm, .50 cal and nickel plating and drilling (2 holes) 9mm. Additionally, all older production of DDI (prior to 2009) was to be removed from the inventory to be reworked to meet the new standards and will process through normal swap out of assets when units request the new DDI. TM 43-0001-27 has updated data sheets of new production DDI.

Table E-4. DDI DODIC/NSN

Type	DODIC	NSN	Model
9mm	AB45	1305-01-568-5691	M917A1
5.56mm	AB48	1305-01-568-5696	M199A1
7.62mm	AB47	1305-01-568-5689	M63A1
.50 cal	AB46	1305-01-568-5686	M2A1

e. SAW ammunition (5.56mm cartridge, models M855 and M856) not fully seated in metallic link belts or with incidental dents on cartridge case shoulder should not be rejected. Such conditions do not affect serviceability of ammunition.

f. Load requirements for stockpile pull-testing of various SAA metal linked ammunition.

(1) The load requirements listed in Table E-5 will apply:

Table E-5. SAA Pull Test Requirements

Type	# of Belts	# of Links	# of Ctgs	Load	Tension Time
5.56mm	10	7	6	19 lbs.	30 sec
7.62mm	10	26	25	25 lbs.	30 sec
.30 cal	10	26	25	25 lbs.	30 sec
.50 cal (M2 links)	10	26	25	80 lbs.	30 sec
.50 cal (M9 links)	10	26	25	100 lbs.	30 sec

NOTE

Inner pack and item samples must be selected from a minimum of ten outer packs. Additional outer packs must be inspected at either the inspection or storage location(s) to make a total sample size of twenty. Pull test does not apply to caliber .50 M15A2.

(2) A belt consisting of the appropriate number of links and cartridges shall be capable of withstanding the appropriate tensile load without separation. Load shall be applied at a uniform rate and belt shall remain under tension as specified in Table E-5.

(3) All pull test failures will be reported IAW paragraph 2-8h or 2-8i as applicable. A pull test failure will be considered to be a major defect for reporting purposes.

g. Classification of primer defects.

(1) Visual standards for primer defects are contained in MIL-STD-636. The purpose of the standard is to provide a standard basis for inspection of small arms ammunition at various small arms manufacturing facilities.

(2) Defect classification of special in MIL-STD-636 is for new production. Table E-3 will be used for classification of primer defect criteria.

(3) Primer defects encountered while performing cyclic inspections will be reported IAW Chapter 11.

h. Clip, cartridge, 5.56, 10 round - small quantities of residual ammunition at the retail level (user) may be reclipped with used clips provided reclipped ammunition is visually inspected 100% at tab end for cracks or missing tabs. Ammunition clips found defective after loading will be replaced.

i. DODIC AA37/AA39 – Cartridges 7.62mm Short Range Training Ammunition (SRTA) Ball, M973, and Cartridges 7.62mm Short Range Training Ammunition (SRTA) Tracer, M974 have plastic projectiles which are more susceptible to damage incurred through normal transportation and handling. Any 7.62mm SRTA with visible damage to the projectile will be considered unserviceable.

j. Close Combat Mission Capability Kit (CCMCK) Marking Ammunition:

(1) DODICs AB09, AB10, AB11, AB15, AB16 and AB17 (see Table E-6 for description) – Ammunition consists of plastic projectiles and two piece cartridge cases susceptible to damage incurred through normal transportation and handling. These cartridges will be utilized with the CCMCK conversion kits for the M16A2, M4 and M249 weapons.

(2) DODICs AA12, AA21, AB12, AB13 and AB14 (see Table E-7 for description) – CCMCK consists of a 9mm cartridge case with a plastic projectile. These cartridges will be utilized with the M9 pistol with SIMUNITION CCMCK conversion barrel.

(3) The following criteria applies to both type of marking ammunition (5.56mm and 9mm):

(a) A five year inspection interval applies.

(b) Any perceived damage to either the projectile or the cartridge case, or evidence of corrosion to the above listed cartridges renders the rounds unserviceable.

(c) Shelf life for CCMCK ammunition will be listed in TB 9-1300-385, Appendix D under non CAD/PAD items. See TB 9-1300-385 Part I, Munitions Suspended and Restricted for condition code requirements based on established threshold timeframes. There are no safety concerns with assets that exceed their threshold, however the user can expect some degraded marking capability.

(d) Storage requirements for CCMCK: if inspectors or users determine that CCMCK assets have been stored in conditions exceeding 145 degrees Fahrenheit, they will notify JMC QAS (paragraph 1-5d(1)) to request an Ammunition Stockpile Reliability Program assessment be conducted. Inspectors and/or users will identify and retained these assets pending JMC QAS direction.

Table E-6. CCMCK 5.56mm Ammunition by DODIC

Model/NOUN	Color	DODIC	NSN
M1042 Cartridge, 5.56mm Practice Ammunition Rifle	Blue	AB09	1305-01-536-5822
	Red	AB10	1305-01-536-5827
	Yellow	AB11	1305-01-536-5829
M1071 Cartridge, 5.56mm Practice Ammunition Linked (SAW)	Yellow	AB15	1305-01-536-9289
	Blue	AB16	1305-01-537-1521
	Red	AB17	1305-01-537-1522

Table E-7. CCMCK 9mm Ammunition by DODIC

Model/NOUN	Color	DODIC	NSN
Cartridge, 9mm FX Markings	Red	AA12	1305-01-424-2410 1305-01-439-9717
	Blue	AA21	1305-01-449-3208
M1041 Cartridge, 9mm Practice Ammunition	Yellow	AB12	1305-01-536-7720
	Blue	AB13	1305-01-536-7721
	Red	AB14	1305-01-536-7722

k. DODICs AB56, AB57, AB58 – Cartridge 5.56mm Ball, M855A1, Enhanced Performance Round: the new 5.56mm enhanced performance round has an exposed steel penetrator. A penetrator that can spin is permissible and has no adverse effect on performance. A penetrator with side-to-side movement should not be fired. Additionally, the projectile has a bronze-colored zinc coating to protect it from the elements and prevent corrosion. The jacket will be 100% in contact with the penetrator.

l. DODIC A518 – Cartridge, Caliber .50 SLAP M903/SLAP-T M962 4:1 Linked (SLAP/SLAP-T): the

caliber .50 Sabot Light Armor Penetrator (SLAP) and Sabot Light Armor Penetrator with Trace (SLAP-T) are linked in a 4:1 configuration (NSN 1305-01-332-8254). The manufacturer of A518 puts calcium stearate powder (white powder) in the container for lubrication purposes. This practice was implemented at the end of development and early production phase of the SLAP/SLAP-T program as a result of the cyclic performance evaluation. However, this practice has not been submitted to the government as an SOP on the current or previous production contracts and/or standardized. A follow-on determination/ evaluation of historical documentation and engineering study will be performed to validate and confirm this procedure. Therefore, at the present time, this is an accepted practice by the government and deemed no adverse effects on the handling and storage of this ammunition. Since the weapon technical manual specifies the ammunition must be clean and dry, the calcium stearate powder should be wiped off the ammunition before use.

m. DODIC AB72 – Cartridge 7.62mm Bottlenose, Blank, M82A1:

(1) NSN: 1305-01-596-1319, HC/D & SCG: 1.4S, NEW: .002475 lbs (.00123 kg).

(2) Utilization: this cartridge is used for the "rendering of honors" in the 7.62mm M14 rifle, employed without a blank firing attachment (BFA). It is also available for use as a training cartridge in the 7.62mm M14 enhanced battle rifle and 7.62mm M24 & M110 sniper weapon systems.

(3) Identification: the round has a double taper neck and no bullet.

n. DODIC AB68 – Armor Test Parts Kit, Ammunition, .30 Caliber, M2 Armor Piercing (AP).

(1) NSN: 1305-01-583-1110; P/N: 13029141; HC/D & SCG: 1.4S; NEW: 0.000086lbs (0.000039 kg); UN S/N: 0055; PSN: Cases, Cartridges, Empty with Primer.

(2) Kit includes 840 ea, .30 Cal M2 AP projectiles and 840 ea primed cases, packed 420 ea per M2A1 can, two M2A1 per wirebound box.

(3) This item is limited distribution to activities and laboratories responsible for testing body armor, Small Arms Proactive Inserts (SAPI) plates, vehicle armor plates, and transparent armor.

(4) Inspect similar to blank ammunition IAW Table E-3 of this Appendix under inspection category R (10 years).

o. MK301 Mod 0, 5.56mm Dim Tracer.

Table E-8 Dim Tracer 5.56mm MK30 MOD 0

DODIC	NSN	Nomenclature
AA99	1305-01-530-3982	Cartridge, 5.56mm, MK301 Mod 0, Dim Tracer
AB03	1305-01-533-5663	Cartridge, 5.56mm Ball, M855 and Dim Tracer, MK301 Mod 0, Linked (4:1)
AB04	1305-01-533-5657	Cartridge , 5.56mm Armor Piercing, M995 and Dim Tracer, M301 Mod 0, Linked (4:1)

(1) NSN: 1305-01-530-3982, HC/D & SCG: 1.4S, Trans. NEW: .004770 lbs. (.002164kg).

(2) NSN: 1305-01-533-5663, HC/D & SCG: 1.4S, Trans. NEW: .003990 lbs. (.001810kg).

(3) NSN: 1305-01-533-5657, HC/D & SCG: 1.4S, Trans. NEW: .004190 lbs. (.001901kg).

(4) The 5.56mm Dim Tracer Cartridge is designed to be used with Night Vision Devices (NVDs) where a lower burning temperature of the Dim trace mix produces light in a spectrum invisible to the naked eyes, but visible only to NVDs. The U.S. Army will use the 5.56mm Dim Tracer Cartridge in Army approved weapon systems chambered to fire the standard NATO 5.56mm cartridge.

(5) Identification: The only distinguishing marks that will identify the MK301 Mod0 from the M855 are, the MK301 Mod0 will have a purple tip.

p. DODIC A191- Cartridge .300 Winchester Magnum Match Grade:

(1) NSN: 1305-01-018-1547, HC/D & SCG: 1.4S, NEW: 0.0095 lbs. (0.0043 kg).

(2) MK248 MOD 0 is intended for use in the MK13 MOD5, .300 Winchester Magnum Sniper Rifle and the M2010 enhanced sniper rifle (ESR). The match grade MK248 MOD0 consist of a large lead-styphnate primer, a copper alloy cartridge case, a smokeless single base propellant (RP14 or RP15 or equivalent) and a 190 grain extruded tip bullet.

(3) Inspect IAW table E-3 of this Appendix under inspection category R (10 years).

APPENDIX F
CARTRIDGE, 60-MM MORTAR

F-1. Item description.

a. FSC: 1310.

b. Ammunition type: Cartridge, 60-mm mortar. Includes the M49-series (HE, DODIC B632), M50-series (TP, DODIC B634), M83-series (illuminating, DODIC B627), M302-series (WP, DODIC B630), M720 (HE, DODIC B642), M720A1 (HE, DODIC BA16), M721 (illuminating, DODIC B647), M722 (WP, DODIC B646), M722A1 (WP, DODIC BA14), M767 (IR illuminating, DODIC BA04), M768 (HE, DODIC BA17), M769 (Full Range Practice, DODIC BA15), M888 (HE, DODIC B643) and M1061 (Mortar, Anti-Personnel Anti-Materiel, DODIC BA29.)

c. 60-mm cartridges are fin-stabilized rounds fired from smooth bore weapons. A complete round consists of a projectile, fin assembly, ignition cartridge, primer, propelling charge, and a fuze. For a complete description of these rounds, see TM 43-0001-28 and the drawing for the particular round.

F-2. Unique safety precautions.

No unique safety precautions are applicable to this item.

F-3. Testing and equipment requirements.

a. All IRI samples will be gaged using a profile and alignment gage. Gaging is not normally required during PI, RI, or UBLI. Gaging, during these inspections (other than IRI), should be limited to individual rounds having visual evidence of damage or other conditions that may preclude loading and firing. Unless the rounds requiring gaging are truly representative of the lot being inspected, they should be disregarded in evaluating the lot.

b. Table F-1 identifies test and measurement equipment.

Table F-1. Equipment Identification List.

Gage, Profile and Alignment			
Drawing	NSN	Preferred Gage	Application
7256348	5220-00-305-6030	YES	All models
5539280	5220-00-395-4450	NO	All models complete
7256419	5220-00-395-4457	NO	Short rounds only
6518134	5220-00-395-4423	NO	Short rounds only
7258360	5220-00-395-4466	NO	Short rounds only

NOTE

Non-preferred gages will not be requisitioned or purchased but may be used if on-hand and serviceable.

F-4. Inspection category and sampling plan.

a. Inspection category.

(1) Category U: 7 years - Jungle Pack Practice without Explosive Components (Inert) cartridges.

(2) Category V: 6 years - Jungle Pack HE, WP and Practice with Explosive Components cartridges.

(3) Category W: 5 years - all Illuminating and Regular Pack Practice without Explosive Components (Inert cartridges).

(4) Category X: 4 years – all Chemical, FS Smoke, Leaflet, Riot Control cartridges and Regular Pack HE, WP, RP and Practice with Explosive Components cartridges.

(5) Inspection interval is to be reduced to 2 years for cartridge lots assigned condition code C due to discolored propellant.

b. The sampling plan for inspection is according to Chapter 2.

F-5. Specific inspection points.

Items will be inspected and classified according to the appropriate paragraphs of this supply bulletin and Table F-2.

F-6. Inspection description and notes.

a. All models with fuzes requiring safety wires.

b. All models with M65 series fuze.

c. All applicable fuze models.

d. Profile and alignment gage. Gage if visually questionable.

e. Place the damaged charge on a M27 fin, oriented so that the propellant rests against the damaged surface. Vigorously shake the fin and charge three times. If any propellant is spilled the damaged charge must be classified as a critical defect. If no propellant is spilled the damaged charge will be classed as a major defect.

f. Ignition cartridge must be assembled with red end next to the primers. (Dwg 9207925 and 9220383).

g. Normally done only during initial receipt inspection as stated in paragraph F-3a.

h. When a component is damaged, or incorrectly assembled, so as to affect the functioning or reliability of the round, it will be classified as a defect.

i. Discoloration of propelling charge containers is a result of high humidity and temperature in storage. Color change is from normal light yellow to dark yellow to light green progressing to darker shades of green. Splotches of discoloration rather than a uniform transition of entire charge container evidences change. When discoloration is present inspections should focus on:

(1) Possible residue buildup on the portion of the fin which is adjacent to the propellant containers.

(2) Deterioration of polyurethane foam lining of the propellant charge supports. Breakdown of this foam leaves residue on the charge containers.

(3) Cartridges are to be considered serviceable if discolored propellant containers are hard, intact and buildup does not cover ignition flash holes. Cartridges

exhibiting these conditions or with foam adhering to the propellant containers are to be assigned condition code C for priority of issue.

j. All 60MM cartridges with propellant charge support assemblies found missing or improperly positioned during the following inspections:

(1) Initial receipt inspections (IRIs).

(2) Periodic inspections (PIs) without evidence of previously being field returns.

k. All 60MM cartridges with propellant charge support assemblies found missing or improperly positioned during (field return) receipt inspections (RIs).

NOTE

Removal and replacement of the propellant charge support must be done with care as improper handling can result in damage to the propellant charges.

Table F-2. Item Defects and Method of Inspection.

Classification	Application	Inspection Method	Inspection Description
1. Critical:			
a. Warning label missing or illegible.	M49A5, M700-series, M888 & M1061	Visual	
b. Fin blade damaged or distorted.	All except M50-series	Visual/Gage	Para F-6d
c. Propelling charge support assembly missing or improperly positioned.	See Para F-6j	Visual	Para F-6j
d. Propelling charge missing or damaged to the extent that propellant shall escape.	M49A5, M700-series, M888 & M1061	Visual/Manual	Para F-6e
e. Propellant increment missing.	M49-series & M302-series	Visual	
f. Primer head above flush with rear surface of fin.	All	Straightedge	
g. Fuze safety wire missing or insecure.	Para F-6a	Visual/Manual	
h. Fuze shear wire missing or insecure.	Para F-6b	Visual/Manual	
i. Ignition cartridge missing or inverted.	M49-series (except M49A5)	Visual	Para F-6f
j. Obturating ring missing.	M49A5, M700-series, M888 & M1061	Visual	
k. WP leaking or evidence of leaking.	M302-series, M722-series	Visual	
2. Major:			
a. Propellant increment missing.	M83-series	Visual	
b. Propellant increment cut or torn.	M49-series, M83-series, M302-series	Visual	
c. Propelling charge damaged but not to the extent that propellant will escape.	M49A5, M700-series, M888 & M1061	Visual/Manual	Para F-6e
d. Fuze not fully seated.	M49A5, M700-series, M888 & M1061	Visual	
e. Fin assembly not fully seated.	M49A5, M700-series, M888 & M1061	Visual	
f. Obturating ring damaged.	M49A5, M700-series, M888 & M1061	Visual	
g. Obturating ring not flush or below bourrelet diameter.	M49A5, M700-series, M888 & M1061	Straightedge	
h. Cartridge fails to fully enter profile and alignment gage.	All	Gage	Para F-6g
i. Any component damaged incorrectly assembled other than described elsewhere).	All	Gage	Para F-6h
j. Glue or asphalt on bourrelet area.	All	Gage	
k. Propelling charge support assembly missing or improperly positioned.	See Para F-6k	Visual	Para F-6k
l. Fin corroded with blockage of the flash holes.	All	Visual	
3. Minor:			
a. Fuze not fully seated.	M49-series (except M49A5)	Visual	
b. Fin damaged or distorted.	M50-series	Visual/Gage	Para F-6h
c. Propellant increment missing, cut or torn.	M50-series	Visual	
d. Ignition cartridge missing or inverted.	M50-series	Visual	Para F-6f
e. Fuze not set on superquick (SQ).	Para F-6c	Visual	
f. Fuze not set on proximity (PROX).	M734 fuze	Visual	
g. Fin corroded with flaking but not blocking flash holes.	All	Visual	
4. Incidental:			
a. Propellant container discoloration.	All	Visual	Para F-6i
b. Fin corrosion with no flaking.	All	Visual	

APPENDIX G
CARTRIDGE, 81MM MORTAR

G-1. Item Description.

a. FSC: 1315.

b. Ammunition Type: Cartridge, 81mm Mortar. It includes the following models:

(1) High explosive ammunition: M362 Series (C222, C223); M374 Series (C236, C256); M821 Series Improved Mortar System (C868); and M889 Improved Mortar System (C869, CA43).

(2) Red Phosphorous ammunition: M819 Improved Mortar System (C870).

(3) Illuminating ammunition: M301 Series (C226), M853A1 Improved Mortar System (C871) and M816 IR Improved Mortar System (C484).

(4) White phosphorous ammunition: M375 Series (C276).

(5) Training and practice ammunition: M43A1 Target Practice (C227), M879 Practice for Improved Mortar System (C875).

c. Obsolete models not specifically addressed in this appendix include the M43 Series (HE), M56 Series (HE), M57 Series (WP), and the M370 (WP). If these models are encountered, applicable portions of this supply bulletin will be used to inspect and classify these rounds.

d. The M1 Sabot cartridge, the 22mm Sub Caliber cartridge, the M68 Training cartridge and the M880 Short Range Practice Round are not to be inspected using this appendix. TM 9-1315-249-12&P provides procedures and criteria to supplement Chapter 2 of this supply bulletin when inspecting the M1 Sabot and 22mm Sub Caliber cartridges. TM 9-1315-252-12&P provides procedures and criteria for inspecting the M880 cartridge and refurbishment kit. The M68 is shipped and stored in an inert configuration.

e. The 81mm cartridges are fin-stabilized rounds fired from smooth bore weapons. A complete round consists of a projectile, fin assembly, ignition cartridge, primer, propelling charge and a fuze. Improved 81mm ammunition (M800 series), M374A3, and M375A3 have an ignition cartridge assembly which includes a primer. Some models of HE cartridges are issued either with or without fuzes. All other rounds are issued fuzed. For a complete description of these rounds see TM 43-0001-28 and the drawings for the particular round.

f. The M374 and M375 Series cartridges have differences between the basic and A1 projectile bodies depending on propelling charges for which they were originally designed. The basic M90 propelling charge has proven compatible and is authorized for use, with either basic or A1 projectile bodies. The M90A1 propelling charge is only authorized for use with the A1 projectile bodies, due to a smaller bourrelet diameter than the basic. This reduction was necessary to cope with the greater bore fouling produced by the M90A1 propellant bag during firing. This dimensional difference between the basic and A1 model projectile body is not cause for gaging or measuring during inspection of a previously renovated lot. The ammunition data card should be checked to assure the propellant model is compatible with the projectile model. This difference must also be considered when planning replacement of the propellant.

g. Practice ammunition for the 81mm includes the M68 Training Cartridge and M1 Sabot with separately issued 22mm Sub Caliber that is available in 4 charge levels (DODICs). Training ammunition for the improved 81mm system utilizes M1 sabots, full range practice rounds (M879) and a short range practice cartridge (M880). The M880 practice cartridge can be rebuilt by the unit from separately issued kits according to TM 9-1315-252-12&P. Each kit contains replacement fuze, fuze windshield, ignition (propelling) cartridge, obturating ring, 3 plastic increment plugs, 3 dud plugs, and a breech plug assembly. All M880 cartridges must have been modified by drilling three holes and adding three dud plugs.

h. Many drawings for the improved 81mm (M800 Series) cartridges are proprietary and therefore cannot be reproduced or disseminated by JMC to other MACOMs.

G-2. Unique Safety Precautions.

Packing clips are not to be removed from the M751 or M775 fuzes used with the M879 and M880 practice rounds during inspection. The packing clip is a positive safety mechanism that is to be removed only just prior to firing.

G-3. Testing and Equipment Requirements.

a. Gaging policy is provided in Chapter 2 of this supply bulletin. Gaging is not normally required during PI, RI, or UBLI. Gaging, during these inspections (other than IRI), should be limited to individual rounds having visual evidence of damage or other conditions that may preclude loading and firing. Unless the rounds requiring gaging are truly representative of the lot being inspected, they should be disregarded in evaluating the lot.

b. Table G-1 identifies test and measurement equipment.

Table G-1. Equipment Identification List Gage, Profile and Alignment

Drawing	NSN	Application
6518071	5220-00-395-4421	All models
6518101	5220-00-395-4422	Short rounds only

G-4. Inspection Category and Sampling Plan.

a. Inspection category:

(1) Category U: 7 years - Jungle Pack Practice without Explosive Components (Inert) cartridges.

(2) Category V: 6 years - Jungle Pack HE, WP and Practice with Explosive Components cartridges.

(3) Category W: 5 years - all Illuminating and Regular Pack Practice without Explosive Components (Inert cartridges).

(4) Category X: 4 years – all Chemical, FS Smoke, Leaflet, Riot Control cartridges and Regular Pack HE, WP, RP and Practice with Explosive Components cartridges.

(5) Category Z: 2 years - all cartridges in plastic mono pack, bulk primers, spotting charges and M880 rebuild kit.

(6) The 2 year inspection interval listed above does not apply to cartridges in plastic monopacks which have been overpacked in PA156 metal containers.

(7) Inspection interval is to be reduced to 2 years for cartridge lots assigned condition code C due to discolored propellant. Interval for all M819 and M853A1 cartridge lots manufactured prior to 1995 is also to be reduced to 2 years.

b. The sampling plan for inspection is according to Chapter 2.

G-5. Specific Inspection Points.

Items will be inspected and classified according to this supply bulletin and Table G-2.

Table G-2. Item Defects and Method of Inspection.

Classification	Application	Inspection Method	Inspection Description
1. Critical:			
a. Fuze not set on safe.		Visual	Para G-6a
b. Fuze safety wire or bore riding pin missing, not secure or improperly engaged.		Visual/Manual	Para G-6b
c. Fuze packing clip missing, insecure, or not properly assembled.	M751 Fuzes M775 Fuzes	Visual Visual	
d. Red band around striker pin is showing (possibly armed).	M751 Fuzes M775 Fuzes	Visual Visual	
e. Primer head above flush with rear edge of fin.	M43 Series M301 Series M362 Series M374, A1, A2 M375, A1, A2	Straightedge Straightedge Straightedge Straightedge Straightedge	
f. Ignition cartridge head not below flush with rear edge of fin.	M374A3 M375A3 M800 Series	Straightedge Straightedge Straightedge	
g. Any propellant increment cut, torn, or missing (with leaking propellant).	M301 Series M362 Series M374, A1, A2 M375, A1, A2	Visual Visual Visual Visual	
h. Any propelling charge container missing or damaged (cracked or delaminated) so that propellant can escape.	M374A3 M375A3 M800-Series	Visual Visual Visual	Para G-6l Para G-6l Para G-6l
i. Fin assembly damaged, distorted, or cracked.	All	Visual/Gage	Para G-6f
j. Warning label on cartridge missing or illegible.	M301A3 M362 M374 Series M375 Series	Visual Visual Visual Visual	
k. Obturating ring missing or broken.	M374 Series M375 Series M800 Series (except M879)	Visual Visual Visual	
l. WP or RP leakage or evidence of leakage.	M375 Series M819	Visual Visual	
m. One or more shear pins missing.	M301 Series M853A1 M819	Visual Visual Visual	
n. Warning label on fuze missing or illegible (if required).	As required	Visual	Para G-6n
o. Crack(s) on projectile	All HE/WP	Visual	Para G-6m
p. Increment holders missing, broken, loose, or improperly bent to hold increment.		Visual	Para G-6r

2. Major:			
a. Primer or ignition cartridge missing or inverted.	All	Visual	Para G-6k
b. Any propellant increment cut, torn, or missing.	M43 Series M68	Visual Visual	
c. Propellant container damaged where propellant cannot escape.	M374A3 M375A3 M800 Series	Visual Visual Visual	Para G-6l Para G-6l Para G-6l
d. Any component damaged or incorrectly assembled (if not described elsewhere).	All	Visual	Para G-6g
e. Fuze assembly not fully seated.		Visual	Para G-6c
f. Fin assembly loose or not fully seated.	All	Visual/Manual	Para G-6h
g. Increment holders missing, broken, loose, or improperly bent to hold increment.		Visual/Manual	Para G-6s
h. Obturating ring not welded.	M374 Series M375 Series M819 M821 M853A1 M879 M889	Visual Visual Visual Visual Visual Visual Visual	
i. Obturating ring not flush or below bourrelet diameter.	M374 Series M375 Series M819 M821 Series M853A1 M879 M889	Straightedge Straightedge Straightedge Straightedge Straightedge Straightedge Straightedge	Para G-6f Para G-6f Para G-6f Para G-6f Para G-6f Para G-6f Para G-6f
j. Obturating ring damaged (other than broken).	M374 Series M375 Series M800 Series	Visual Visual Visual	
k. Cartridge fails to freely enter profile and alignment gage.	All	Gage	Para G-6i
l. Glue, asphalt, wax, or cement on cartridge (bourrelet area only).	All	Gage	Para G-6f
m. Fuze well liner missing or damaged.		Visual	Para G-6d
n. Monopack cracked completely through.	M821 M889	Visual Visual	Para G-6o Para G-6o
o. Monopack O Ring displaced out of groove.	M821 M889	Visual Visual	Para G-6o Para G-6o
p. Warning label on cartridges missing or illegible.	M800 Series	Visual	
q. Obturating ring missing or broken	M879	Visual	
3. Minor:			
a. Explosive in fuze well threads.		Visual	Para G-6d Para G-6j
b. Closing plug not fully seated.		Visual	Para G-6e
c. Paint missing in an area greater than ¼ inch square.	All	Visual	
d. Fuzewell liner removeable by hand.	All	Manual	Para G-6e
e. Fuze not set in the “PROX” mode.	All with M734 Fuze	Visual	
f. Fin corroded with flaking but not blocking flash holes.	All	Visual	
4. Incidental:			
a. Propellant container discoloration.	M374A3, M375A3, and M800 Series	Visual	Para G-6q
b. Fin corrosion with no flaking.	All	Visual	

G-6. Specific Inspection Points.

a. All models with fuzes having a safe setting.

b. All models with fuzes requiring a safety wire, safety pin, or bore riding pin.

c. All fuzed cartridges.

d. All unfuzed HE cartridges.

e. All models with closing plugs.

f. Gage with a profile and alignment gage only if visually questionable (4-power magnification permitted for identification of cracks).

g. When the component is damaged to the extent that its functional effectiveness has been destroyed, it will be classified as a defect.

h. When the fin assembly can be turned upon application of hand pressure, it will be classified as a defect.

i. Normally done only during initial receipt inspection. See paragraph G-3a above.

j. Caked explosive in threads will be classified as a defect. Explosive dust will not be considered a defect.

k. Ignition cartridge must be assembled with red end towards the fin (dwg 8881026). Cartridges with combined ignition cartridge and primer do not require specific orientation. These include trainers and improved 81 mm cartridges.

l. Rigid propellant containers have a water resistant finish to protect propellant from moisture contamination. Cracks, dents, seam, or propellant fill hole cover delamination or other damage would be classified as a major defect. If damage is severe enough to permit propellant to escape, the defect is critical. To check integrity of propellant containers, place the charge on a fin and hand shake vigorously three times.

m. Projectile body (HE or WP) with open or closed crack (cold-shut) is a safety hazard during firing.

n. Missing warning labels are not a defect for M524A5 and M524A6 fuzes. Cartridges missing warning labels will not be classified unserviceable based on this condition. DSR's will be annotated and labels replaced during future renovation.

o. Any visual defect that would permit air and moisture to enter the container is to be classified as a major defect. Lots rejected for defective monopack containers are to be assigned condition code C.

p. Damaged metal outer containers for the M821 or M889 cartridges are not to be classified defective unless inspection indicates damage to inner container or damage is severe enough to require replacement for shipment. Internal cushioning will protect monopack inner container from damage even when metal container has dents one inch in depth.

q. Discoloration of propellant charge containers is a result of high humidity and temperature in storage. Color change is from normal light yellow to dark yellow to light green progressing to darker shades of green. Splotches of discoloration rather than a uniform transition of entire charge container evidences change. When discoloration is present inspections should focus on:

(1) Possible residue buildup on the portion of the fin which is adjacent to the propellant containers.

(2) Deterioration of polyurethane foam lining of the propellant charge supports. Breakdown of this foam leaves residue on the charge containers.

(3) Cartridges are to be considered serviceable if discolored propellant containers are hard, intact and buildup does not cover ignition flash holes. Cartridges exhibiting these conditions or with foam adhering to the propellant containers are to be assigned condition code C for priority of issue.

r. All 81mm cartridges with propellant charge support assemblies found missing or improperly assembled during the following inspections:

(1) Initial receipt inspections (IRIs).

(2) Periodic inspections (PIs) without evidence of previously being field returns.

s. All 81mm cartridges with propellant support assemblies found missing or improperly assembled during (field return) receipt inspections (RIs).

APPENDIX H
CARTRIDGE, 105MM HOWITZER

H-1. Item Description.

a. DODACS 1315-

C433	C440	C443	C444
C445	C448	C449	C450
C451	C452	C453	C454
C455	C457	C462	C463
C468	C473	C477	C479
C542	C544	C546	CA11
CA13	CA52	CA53	

b. Ammunition Type: Cartridge, 105mm howitzer. Includes the following models: M1, HE; M60 series, WP; M84 series, HC, BE; M314 series, Illuminating; M327 series, HEP and HEP-T; M395, Blank; M444, HE (ICM); M546, APERS-T; M548, HERA; M629, Tactical CS, M760, HE; M913, HERA; M927, HERA; M1064, IR Illuminating; and M1130, HE, PFF, BB. Does not include toxic filled or M413 (ICM), HE, and M84B1, Leaflet that are type classified obsolete. Does not include C430, C431, C432, CA17 (fixed crimped HE M1) developed for Air Force use, and C472 (HEAT-T).

c. Army 105mm howitzer cartridges are semi-fixed and fired from rifled howitzers. A complete service round consists of a projectile, fuze, cartridge case with primer and propelling charge. Cartridges are issued fuzed or unfuzed. For a complete description of these rounds see TM 43-0001-28 and drawing for respective round.

H-2. Unique Safety Precautions.

a. Fuze MTSQ M501 and M501A1 are not drop safe. Dropping or rough handling of projectile assembled with either fuze can and has resulted in fuze functioning and expulsion of projectile contents.

b. Handle high explosive projectiles M1 and M760 carefully. They are susceptible to sustaining non-visible cracks on nose or ogive area if dropped or struck against a hard surface. Potential for cracking increases greatly when temperature drops below 30 degrees Fahrenheit. Projectiles dropped onto hard surface during course of inspection, or suspected of having been dropped due to visible damage, should be segregated and assigned an unserviceable condition code.

c. Dummy Propelling Charge M3 assembled to M14 cartridges is loaded with "asbestos, short fiber, commercial." All 105mm M14 Dummy Cartridges are to be assigned Condition Code HOTEL for disposal. Ammunition Surveillance organizations should coordinate with 105mm firing units to effect turn in to ammunition supply points.

(1) The M3 Dummy Propelling Charges can be turned into the local Defense Reutilization Marketing Office (DRMO) providing following conditions are met:

(a) Items are free from any kind of explosives, organic, or ignitable materials capable of exploding or detonating. Qualified personnel will inspect the items to assure they are inert, and sign a statement testifying to this effect on the DD Form 1348.

(b) Charges that are being used in the field must be double bagged in plastic and placed in 55 gallon drums. Items currently in depot storage may be turned into DRMO in their over pack configuration.

(c) A profile sheet, Material Safety Data Sheet (MSDS) or a printout from the DOD Hazardous Material Information System (HMIS) database, describing the asbestos must accompany the load sent in for disposal.

(2) Additional information can be obtained from addressee in paragraph 1-5.d.(18)(a).

H-3. Testing and Equipment Requirements.

a. Gage all IRI samples using gages identified in Table H-1, as applicable. Gaging is not normally required during PI, RI, or UBLI. Gaging, during these inspections (other than IRI), should be limited to individual rounds having visual evidence of damage or other conditions that may preclude loading and firing. Unless the rounds requiring gaging are truly representative of the lot being inspected, they should be disregarded in evaluating the lot.

b. Assure either Preformed Packing (O-ring), NSN 5331-00-584-1581 or 5331-00-265-1097 is available prior to conducting inspection of M444, HE. This will avoid delay in assembling torque-tested fuzes to projectile. Always use new Preformed Packing for assembling fuze to projectile.

c. Ammunition drawings require that the supplementary charge be immobile in the HE cartridges. LAP Plants assemble pull-tab type closing plugs to cartridges at manufacture. Inspectors can remove these plugs without breaking the tab by using a fuze wrench or prying tool to tap/pry them out. Inspectors can re-use serviceable plastic closing plugs, with intact pull-tabs, on surveillance samples. The following NSNs are available as replacement plugs, if required:

(1) 1315-01-188-3211.

(2) 1315-00-987-1621.

(3) 1315-00-821-6608.

H-4. Inspection Category and Sampling Plan.

a. Inspection Categories:

(1) Category W: Lots with other than M67 propelling charges.

(2) Category Y: Lots with M67 propelling charges less than 15 years old, except M84 series, HC Smoke BE, and M629 Tactical CS.

(3) Category Z: Lots with M67 propelling charges 15 years and older, and M84 series, HC Smoke BE and M629, Tactical CS.

b. Cartridges with M67 Propelling Charges: HE, M1; SMOKE, WP M60 series; HC, M84 series; Illuminating, M314 series HE, M444 (ICM), M927 HERA and M1130, HE, PFF, BB.

(1) To ensure the war fighter receives the best ammunition possible, only lots in condition code “A” with the newest propelling charges will be selected for shipment to combat zones, unless otherwise specified. Lots with propelling charges 15 years old or older will

be assigned condition code "C," for priority of issue, and consumed in training if possible.

(2) Each 105mm howitzer lot with a M67 propelling charge 15 years old or older will require a Pre-Issue-Inspection (PII) unless a PII/Periodic Inspection equivalent inspection has been performed on the lot within the last 60 days.

(3) Report cartridges/lots found with deteriorated propelling charges IAW DA PAM 750-8 with a courtesy copy to addressee in paragraph 1-5.d.(20)(d).

c. Sampling plan for inspection is IAW Chapter 2.

H-5. Specific Inspection Points.

a. QASAS will inspect and classify items according to this supply bulletin and Table H-2.

b. QASAS will inspect and torque test assembled fuzes as required by Appendix X. Remove fuze from projectile only if torque test is required.

c. Cartridge, 105mm, M60 series WP will be packaged with projectile base down. When packaged or unitized in other orientations and subjected to high temperatures (111+ degrees F) filler will melt, change position (hence center of gravity), and upon solidification cause poor ballistics with resultant short rounds.

d. HERA, M548, M927 rocket motor spike may be contaminated with a yellow crystalline substance composed of 2-Nitrodiphenylamine. Double base cast propellants used in rocket motor also have a history of exuding a NG plasticizer that tests have proven to be quite insensitive. Both may give appearance of corrosion but presence of either substance is not a defect. Annotate occurrence on Depot Surveillance Record Cards for information purposes.

e. Some HC smoke rounds have been reported as having a white powdery residue in the fuze well and under the fuze closing plug. This substance has been laboratory tested and determined to be aluminum and zinc chlorides. It is not an explosive hazard and is considered to be an incidental defect. Removal of the white residue is not necessary prior to fuzing and use of the cartridge. If this residue contacts the skin, wash skin thoroughly.

H-6. Inspection Description and Notes.

a. Remove propelling charge from cartridge case. Apply light side-to-side pressure to primer end with fingers. Primer is only press fit into cartridge case so avoid excess force. Slight movement of primer from side to side is not a defect unless movement results in primer head above flush with base of cartridge case.

b. Sweep a stiff non-sparking ruler with a true edge of at least 4 inches in length across cartridge base. If resistance is noted, cartridge case has a high primer.

c. Cartridges requiring supplementary charges may detonate in-bore if fired without charge. Supplementary charge prevents booster from striking base of fuze liner, should it separate from fuze.

d. HE projectiles known to have been dropped on ogive or evidencing damage to this area shall be classified unserviceable. Report this ammunition to, the office in paragraph 1-5.d.(1) by message, identifying lot number, quantity, and DODIC and include circumstances of incident causing damage. Retain cartridge, pending response to report.

e. Ascertain reason for gaging failure, i.e. malformed threads, eccentric fuze well, cocked or shallow fuze well, etc. Projectiles with damaged threads that pass gaging are not defective. A concentricity gage (deep cavity) is not available for M548 HERA cartridges. Utilize an inert M514A1 proximity fuze to assure acceptable concentricity and depth of fuze well. The M514A1 proximity fuze is available from addressee in paragraph 1-5.d.(20)(e); order part number 1920211-708153 I.

f. Projectile should fit freely into mouth of cartridge case. Inspector will report cartridges that fail gaging IAW paragraph 2-7 of this SB.

g. Polysulfide rubber on fuze threads or O-rings between fuze and ogive are alternate methods to seal fuze well against intrusion of moisture. Absence of one or the other might cause degradation of expulsion charge with failure of cargo to eject properly.

h. Propelling Charges.

(1) M67 Propelling charge.

(a) Consists of seven numbered increment bags. Increments are stacked in cartridge case starting with increment one at the base.

(b) Charge 5 has lead foil sewn into bag (except for charges with integral lead carbonate). Foil must face primer. Visual inspection will indicate whether this is present.

(c) Lead carbonate has been introduced as an alternate to lead foil in new manufacture and was utilized exclusively, beginning with propellant lot RAD84C-070356. This compound is integral with the propellant grain in charges 3 through 7 and its presence cannot be determined by visual examination. Review of propelling charge Ammunition Data Card may not reveal lead carbonate or lead foil as components. Propelling charges manufactured with propellant manufactured prior to RAD84C-070356 require lead foil.

(d) Inspector will utilize SB 742-1, Chapter 13, paragraph 13-7 and Table 13-1 as applicable in conjunction with this appendix. Special emphasis will be placed on condition of cloth. Inspection history demonstrates loss of tensile strength may occur without prior discoloration.

(e) Assembled to HE, M1; Smoke, WP M60 series; HC Smoke, M84 series; Tactical CS, M629; Illuminating, M314 series; HE (ICM), M444, and M927 HERA.

(2) M176 Propelling Charge - Consists of five increments numbered 3 through 7 stacked starting with number 3 at the base. Charge assembled only to HERA, M548.

(3) M121 Propelling Charge assembled only to APERS-T, M546, consists of two increments numbered 6 and 7 with number 6 found at the base.

(4) Charge, Propelling for Cartridge, 105mm, HEP-T M327 (no model number) is a single increment charge assembled only to HEP, HEP-T M327.

(5) M200 Propelling Charge - single increment charge assembled only to HE, M760 and DPICM, M915.

(6) M229 Propelling Charge -single increment, similar to M200 except for presence of flash reducer assembled to muzzle end of charge. Assembled only to HERA, M913.

(7) Test tensile strength of cloth by placing parallel thumbs firmly on the propellant bag and applying tension to the cloth by spreading thumbs outward. Weakness of the cloth should be obvious. Inspector must take care so as not to severely rupture the bag, which would result in propellant spillage. Blue spots on bag usually accompany loss of tensile strength. Assign priority of issue for training and shorten inspection cycle (at discretion of QASAS in charge) if blue bags are noted but no evidence of loss of tensile strength. Ammunition not authorized for training will only be assigned a shorter inspection cycle.

(8) Small holes in bags are acceptable, providing they do not allow loss of propellant and are not attributable to deterioration.

i. Foreign matter in fuze well may be ascertained to be inert or high explosives by use of laboratory analysis. Webster's Reagent is unreliable and may only be utilized to confirm inertness. Color of explosives will range from burnt orange to brown color when reagent is applied to TNT or Composition B.

(1) Exudate may be identified as an oily liquid or re-solidified mass at edges, bottom and/or sides of fuze well liner. Exudate results when explosives have been exposed to elevated temperatures (above authorized storage temperature), over a period of time and are forced through interface of fuze well liner and projectile. TNT contaminated with products residual to manufacturing process is prone to this. Lot history should be reviewed to expose extraordinary circumstances that could reveal cause of exudation, i.e. desert storage in South West Asia.

(2) Other causes of TNT explosives contamination are sloppy workmanship at time of manufacture and migration of small flakes from under fuze well liner. The latter form of contamination should not be cause for lot rejection but should be annotated on surveillance records and removed incidental to required minor maintenance.

j. Presence of black powder contamination in the fuze well due to defective expulsion charge is a critical defect.

k. Evidence of white phosphorus (WP) filler in fuze well is a critical defect. Submerge projectile in water filled container when condition is encountered.

l. Remove supplementary charge, insert two fingers into fuze well, apply pressure to side of liner and attempt to remove it. Lot will not be rejected for loose fuze well liners. Instead, Depot Surveillance Record Card will be annotated and defect corrected at time of other required maintenance.

m. Superficial cracks in closure cup will not be cause for rejection. Cartridge is defective if cracks are deep enough to allow moisture contamination.

n. A .006 feeler gage shall not enter this joint more than ⅛ inch for 360 degrees. This criteria is only applicable to ammunition in field service account.

o. 0.6mm (approximately 0.024") feeler gage shall not enter this joint at any point.

H-7. References.

a. TM 9-1015-203-12.

b. TM 9-1015-234-10.

c. TM 9-1015-252-10.

d. TM 9-1300-251-20&P.

e. TM 9-1300-251-34&P.

f. TM 43-0001-28.

Table H-1. Equipment Identification List.

Description	Drawing	NSN	Application
Gage, Profile & Alignment	9280415 7258482	5220-01-295-5383 5220-00-313-3090	All All
Gage, Concentricity (deep cavity)	7304529	5220-00-395-4479	All unfuzed M1, M760and M913
Gage, Plug, Thread and Concentricity	6024125	5220-00-395-4397	All unfuzed M84A1, M314 series, M60 series
Profile and Alignment Gages are interchangeable			
NOTE: Special torque test equipment utilized to check fuze setting torque is specified in Appendix X			

Table H-2. Item Defects and Method of Inspection.

Classification	Application	Inspection Method	Inspection Description
1. Critical:			
a. Primer above flush.	All	Straightedge	Para H-6
b. Loose primer.	All	Manual	Para H-6a
c. Cracks in projectile.	All	Visual	
d. Distorted or out of round projectile.	All	Visual/Gage	

e. Exudation of filler around fuze well liner.	All HE	Visual	Para H-6i
f. Rocket-Off cap or Base Bleed cover missing or pierced	M548, M913, M927, M1130	Visual	
g. Incorrect number of propelling charge charges.	All with adjustable increments	Visual	
h. Supplementary charge missing.	M1, M760, M548, M913, M927, M1130	Visual	Para H-6c
i. Fuze well liner missing.	M1, M760, M548, M913, M927	Visual	
j. Leaking black powder.	M84 series, M314 series, M395 blank	Visual	Para H-6j
k. Leaking WP.	M60 series	Visual	Para H-6k
l. Projectile, HE; with damaged ogive/nose.	M1, M760	Visual	Para H-6d
m. Flash reducer missing insecure.	M913	Visual	
2. Major:			
a. Damaged rotating band.	All	Visual	
b. Fuze well threads damaged.	All	Visual	Para H-6e
c. Fuze well threads fail to gage.	M1, M760, M548, M913, M927, M1130	Gage	Para H-6e
d. Fuze not staked or improperly staked.	All fuzed cartridges	Visual/Drawing	
e. Fuze fails disassembly torque test.	All fuzed	Torque test	
f. Fuze fails setting torque test.	All with MTSQ. (except M577 series)	Torque test	
g. Cartridge case severely dented.	All	Visual/Gage	Para H-6f
h. O-ring or fuze sealant missing.	M444	Visual	Para H-6g
i. Weight zone marking missing, mixed, visual incorrect, or unidentifiable. Prick punch marks in the center of each square are not required.	All	Visual	
j. Propelling charge cut or torn.	All	Visual	Para H-6h
k. Deteriorated propellant bag.	All	Visual	Para H-6h
l. Incorrect sequence of propelling charge.	All with adjustable increment charges	Visual	
m. Foil side of bag, charge 5, not facing primer.	All with M67 charges with lead foil.	Visual	Para H-6h
n. Lead carbonate or lead foil missing.	All	Visual	Para H-6h
o. Ctg case/proj fail to chamber gage.	All	Gage	Para H-6f
p. Hole through closing cup.	M395	Visual	Para H-6m
q. Closure cup loose.	M395	Manual	
r. Crack in closing cup.	M395	Visual	Para H-6m
s. Tracer plug or disks damaged.	M327	Visual	
t. Excessive gap between rocket motor and warhead.	M548, M913, M927	Gage	Para H-6n
3. Minor:			
a. Closing cup seal damaged.	M395	Visual	Para H-6n
b. Loose fuze well liners.	M1, M760, M548, M913, M927	Manual	Para H-6l
c. Supplementary charge pad missing.	M1, M760, M548, M913, M927	Visual	
d. Cord between increments broken.	All with adjustable increments	Visual	
e. Fuze well spacer missing.	All unfuzed HE and HERA	Visual	
f. Excessive gap between Base Bleed assembly and plug adapter.	M1130	Gage	Para H-6o
4. Incidental:			
White residue in fuze well or under closing plug.	All HC smoke only	Visual	Para H-5e

APPENDIX I
CARTRIDGE, 105MM APFSDS-T, M735, CANISTER, M1040, TP-T, M467A1, HEPT, M393A3 and TPDS-T, M724A1

I-1. Item Description.

a. DODAC:

(1) 1315-C520. Cartridge, 105mm, TPDS-T, M724A1.

(2) 1315-C521. Cartridge, 105mm, APFSDS-T, M735.

(3) 1315-CA40. Cartridge, 105mm, Canister, M1040.

(4) 1315-CA37. Cartridge, 105mm, TP-T, M457A1.

(5) 1315-CA32. Cartridge, 105mm, HEP-T, M393A3.

b. Ammunition Type:

(1) Cartridge, 105mm Target Practice, Discarding-Sabot, with Tracer, (TPDS-T) M724A1

(2) Cartridge, 105mm Armor-Piercing Fin-Stabilized, Discarding-Sabot, with Tracer, (APFSDS-T) M735.

(3) Cartridge, 105mm, Anti-Personnel (Canister) M1040.

(4) Cartridge, 105mm, Target Practice with Tracer (TP-T), M467A1.

(5) Cartridge, 105mm, High Explosive Plastic with Tracer (HEP-T), M393A3.

c. The design of the M724A1 is intended for use in the Tank Mounted 105mm M68 cannon for gunnery Training. The discarding sabot round is similar in external appearance and is ballistically similar to 2,000 meters with the APDS-T cartridge M392A2. There is a tracer located in the base of the projectile. A plastic band encircles the sabot at the forward end. A fiber rotating band and rubber obterating band are mounted toward the base of the sabot. The igniter tube of the electric primer extends almost the entire length of the propellant packed loosely in the cartridge case. Some M724A1's may be assembled with the spiral-wrapped cartridge case. For a complete, detailed description of this items, see appropriate TM's, drawings, and specifications. The M724A1 has four main components that are of particular concern in surveillance inspections. These components and their basic material compositions are as follows:

(1) Projectile: steel body.

(2) Rotating bands: copper alloy.

(3) Cartridge case: steel.

(4) Primer.

d. The design of the M735 round is typical of the new family of 105 mm APFSDS-T cartridges (such as the M735, M774 and M833). While lacking the depleted uranium (DU) core of the M774 or M833, the M735 cartridge does contain other design features characteristic of this family that warrant special emphasis during life-cycle surveillance of this round. These areas of emphasis are specified in paragraph I-5 of this appendix. For a complete, detailed description of this group of items, see appropriate TMs, drawings, and specifications. The M735 cartridge has six main components that are of particular concern in surveillance inspections. These components and their basic material compositions are as follows:

(1) Sub projectile: tungsten (core); steel/ nickel (body).

(2) Sabot: aluminum (anodized).

(3) Bourrelet: steel.

(4) Obturating Band: nylon.

(5) Windshield: aluminum (anodized).

(6) Windshield tip: steel.

e. The M1040 is intended for use in the M6A1 gun mounted on the Mobile Gun System (MGS) of the STRYKER Brigade Combat Team. The design of the M1040 is different than most 105mm cartridges. While the M1040 share a cartridge case, obturator, and primer design similar to other 105mm tank ammunition rounds, its projectile is a unique design including nylon and aluminum parts that contain tungsten spheres. These characteristics require special emphasis during life-cycle surveillance of this round. These areas of emphasis are specified in paragraph I-5 of this appendix. For a complete, detailed description of this group of items, see appropriate TMs, drawings, and specifications. These components and their basic material compositions are shown as follows:

(1) Front can: aluminum (anodized).

(2) Body: Nylon.

(3) Cap: aluminum (anodized).

(4) Obturator: nylon.

(5) Primer.

(6) Cartridge case: steel.

f. The design of the M47A1 and M393A3 is intended for use in the M68A1 gun mounted on the Mobile Gun System (MGS) of the STRYKER Brigade Combat Team. The M467A1 is designed as a low cost training round for the M393A3, which is a high explosive plastic tactical cartridge. The M467A1 and M393A3 contain other design feature characteristics that require special emphasis during life-cycle surveillance of these rounds. Their areas of emphasis are specified in paragraph I-5 of the appendix. For a complete, detailed description of this items, see appropriate TMs, drawings, and specifications. The M467A1 and M393A3 have four main components that are of particular concern in surveillance inspections. These components and their basic material compositions are as follows:

(1) Projectile:

(a) M467A1: inert, steel body.

(b) M393A3: high explosive plastic charge, steel body.

(2) Rotating bands: copper alloy.

(3) Cartridge case: steel.

(4) Primer.

I-2. Unique Safety Precautions.

a. The primer electrode is the mechanism for transferring electrical or radio frequency (RF) energy to the primer to cause initiation. Energy is transferred if only the center electrode of the primer is being touched. During ammunition handling/loading, a hand may contact the aft cap, primer and center electrode at the same time without risk. There is danger when only the center electrode is contacted.

b. Personnel should not carry any unauthorized wireless/electronic devices when performing uploading, downloading, and pre-firing operations.

c. Tank personnel should never operate any tactical radio in the 200-280 MHz frequency range when performing uploading, downloading, and pre-firing operations. If possible, operate the tactical radio in its hopping mode.

d. Maintain a safe separation distance (SSD) of 30 meters (99 ft) between vehicles/personnel operating UHF radios in the 220-280 MHz frequency range, and operations involving unpackaged tank ammunition.

e. Always wear gloves (e.g., combat vehicle crewman type MIL-G-44108) when handling main gun ammunition. The human body absorbs RF energy that could be transferred to the primer electrode.

f. Never attempt to clean the primer or the primer electrode on the aft face of the cartridge case by touching the primer of electrode with any object or tool.

g. To clean ammunition, wipe it with a dry, clean, soft rag. Do not use abrasive material or cleaning solvent.

I-3. Testing and Equipment Requirements.

Table I-4 identifies test and measurement equipment and gaging requirements.

I-4. Inspection Category and Sampling Plan.

a. Inspection category W: 5 years (for items in depot storage).

b. The sampling plan is IAW Chapter 2.

c. A stockpile reliability test program will be conducted on this cartridge. Samples selected for inclusion in this program will be inspected visually in accordance with Table I-1 prior to shipment to the test site. Inspection results will be annotated on a DSR and a copy forwarded to addressee in paragraph 1-5.d.(20)(h). The sampling interval will be as prescribed by HQ JMC. This program is designed to see what effect storage, uploading, handling, and downloading have on performance. Both ballistic testing and teardown inspection will be performed at designated CONUS locations.

d. Annual basic load inspection will be performed on this cartridge by QASAS according to Chapter 8.

e. Storage of empty PA-117 containers should be examined to verify that covers are locked in place and containers are protected from the elements.

I-5. Specific Inspection Points.

Item will be inspected and classified according to Chapter 2 and Tables I-1, I-2 or I-5.

I-6. Inspection Description and Notes.

a. M735 Cartridge, APFSDS-T:

(1) Surveillance samples with projectiles exhibiting lateral movement are not considered defective unless one or more of the following conditions are noted:

(a) Cartridge deformation preventing profile and alignment gaging or chambering.

(b) Crimp out of groove.

(c) Evidence of propellant dusting on the outside of the cartridge case or projectile.

(2) The ability to fully gage or chamber the round should be the determining factor in doubtful cases.

b. M1040 Cartridge, Canister:

(1) Inspection for loose aluminum can: surveillance samples of the can are considered damaged if the aluminum can can be spun or rotated by hand while firmly holding the nylon body.

(2) Inspection for loose aluminum cap: surveillance samples of the cap are considered damaged if the aluminum cap can be rotated at all, while firmly holding the aluminum can.

(3) The ability to fully gage or chamber the round should be the determining factor in doubtful cases.

c. M467A1, M393A3 and M724A1 Cartridges.

(1) Surveillance samples of the projectiles should not be able to spun or rotated in relation to cartridge case by hand. There shall be no movement of the projectiles within the cartridge case, i.e. rotating, wobbling, and/or evidence of an unsecured condition.

(2) The maximum gap permitted at shoulder of rotating band and mouth of cartridge case is 1.3mm. For the M467A1 and M393A3 and 0.02 inches for the M724A1.

d. Testing has demonstrated that the electric primer assembled to these rounds is insensitive to initiation from mechanical impact. Primers or igniters above flush are therefore to be considered major defects rather than critical. (Any straight edge rule is suitable for checking this characteristic.)

e. Perform gaging according to Table I-4.

f. Primers must be staked in one place (M1040) or two places, approximately 180-degrees apart. Stakes should show evidence of moving cartridge case material into joint at cartridge case to primer. Stakes on primers with wrench holes will not necessarily deform wrench hole. If there is no evidence of metal deformation at cartridge case and primer joint, then perform the following:

(1) Mark a line across primer head and cartridge case. Apply disassembly torque of 175-inch pounds.

(2) Check line to verify no movement.

g. Container dents that are less than ¼ inch do not require repair. Dents greater than ¼ inch that impair the structural integrity of the PA-117 container or prevent the removal of the cartridge case are major defects. A cartridge that cannot be removed in the PA-117 shipping and storage container shall be placed in CC-F and reported by ACR with info copy by email to the office in paragraph 1-5.d.(1). Cartridges removed from damaged containers that evidence dented cartridge cases shall be placed in CC-H and reported by ACR as above.

h. Moisture noted within PA-117 containers indicated ammunition was either wet when containerized or the interior components of the PA-117 were wet when the ammunition was packed out. Containers with wet interior projectile supports and spacers are considered unserviceable until the moisture intrusion condition is corrected. Cartridges found in such containers must be closely examined for moisture damage according to the applicable tables.

i. Any corrosion on the sidewall of the projectile body and/ or cartridge case or any pitting on the projectile.

j. Where the total surface area of the corrosion spots is equal to or greater than 0.5 inch square (equal to or greater than approximately 3 centimeters square) located on the forward end of the projectile surface.

I-7. References.

a. TM 9-1015-203-12.

b. TM 9-1015-234-10.

c. TM 9-1015-252-10.

d. TM 9-1300-251-20&P.

e. TM 9-1300-251-34&P.

f. TM 9-2320-311-10-11.

g. TM 43-0001-28.

Table I-1. Item Defects and Method of Inspection for Cartridge, 105mm, APFSDS-T M735.

Classification	Application	Inspection Method	Inspection Description
1. Critical: none defined.			
2. Major:			
a. Excessive lateral movement of projectile.		Visual/Manual/Gage	Para I-6a
b. Primer or igniter above flush.		Visual/Gage	Para I-6d
c. Primer staking missing.		Visual	Para I-6f
d. Windshield or windshield tip bent or damaged.		Visual	
e. Windshield loose (lateral or longitudinal looseness only).		Manual	
f. Bourrelet cracked or loose.		Visual	
g. Sabot cracked.		Visual	
h. Missing parts (e.g., bourrelet, obturator, windshield tip, bourrelet screws).		Visual	
i. Hose clamp not removed from around sabot (reference TM 9-2350-series or dwg 9296707).		Visual	
j. Obturating band damaged (i.e., cracked, broken, or gouged).		Visual	
k. Failure of cartridge to gage.		Gage	Para I-6d
3. Minor:			
a. Windshield cushion missing.		Visual	
b. Evidence of poor workmanship.		Visual	

Table I-2. Item Defects and Method of Inspection for Cartridge, 105mm, Canister, M1040.

Classification	Application	Inspection Method	Inspection Description
1. Critical: none defined.			
2. Major:			
a. Loose can (able to spin).		Manual	Para I-6b
b. Loose cap (able to spin).		Manual	Para I-6b
c. Damage to can (cracks, dents, splits).		Visual	
d. Damage to body (cracks, chips).		Visual	
e. Damage to cap (cracks, dents, splits).		Visual	
f. Primer above flush.		Visual/Gage	Para I-6d
g. Primer stake missing.		Visual	Para I-6e
h. Obturator damaged (i.e., cracked, broken, or gouged).		Visual	

i. Corrosion on metal parts.		Visual	
j. Failure of cartridge to gage.		Gage	Para I-6d
3. Minor:			
Evidence of poor workmanship.		Visual	

Table I-3. Item Defects and Method of Inspection for PA-117 Shipping and Storage Container.

Classification	Application	Inspection Method	Inspection Description
1. Critical: none defined.			
2. Major:			
a. Cover Assembly nonfunctional.		Visual	
b. Gasket missing or defective.		Visual	
c. Internal components/packaging missing or defective.		Visual	
d. External components missing or defective.		Visual	
e. Dents greater than ¼ inch deep that prevent cartridge extraction.		Visual	Para I-6g
f. Perforations/holes.		Visual	
g. Internal components/packaging moisture soaked.		Visual	Para I-6h
h. Markings illegible, precluding proper identification of nomenclature and lot number.		Visual	
3. Minor:			
Protective finish on container body (not rims and rings) with pitted corrosion over 10 percent of surface.		Visual	

Table I-4. Equipment Identification List.

Description	Inspection	NSN	Application
Gage, profile and alignment	Complete cartridge	5220-00-231-7775	IRI
Note 1. Ring gaging required only if round fails profile and alignment gaging.			
Note 2. Profile and alignment gaging required only if not accomplished during IRI, or if round is visibly damaged. Profile and alignment gaging is required only one time during life cycle of lot.			

Table I-5. Item Defects and Method of Inspection for Cartridge, 105mm, TP-T, M467A1, HEP-T, M393A3 and TPDS-T, M724A1.

Classification	Application	Inspection Method	Inspection Description
1. Critical:			
Damage to projectile (cracks, chips, nicks, burs or corrosion).	M393A3 only	Visual	
2. Major:			
a. Loose projectile.		Manual	Para I-6c
b. Damage to projectile (cracks, chips, nicks or burs).	M467A1 only	Visual	
c. Nicks, burs, or chips on rotating bands that causes outer diameter of the band to be raised up or that cover the width of the band.		Visual	
d. Gap between cartridge case and rotating band tip.		Gage	Para I-6c
e. Primer above flush with case base.		Visual/Gage	Para I-6d
f. Primer stake missing.		Visual	Para I-6f
g. Corrosion on metal parts or on the primer.		Visual	
h. Failure of cartridge to gage.		Gage	Para I-6e
i. Corrosion and/ or pitting	M724A1	Visual/Manual	Para I-6i
3. Minor:			
a. Evidence of poor workmanship (paint on body or markings on cartridge are smeared or illegible etc.).		Visual	
b. Corrosion spons on the forward face of the projectile.	M724A1	Visual/Manual	Para I-6j

APPENDIX J
CARTRIDGE, 105MM APFSDS-T, M774, M833 AND M900

J-1. Item Description.

a. DODACS: 1315-C523; C524; C543.

b. Ammunition Type: Cartridge, 105mm Armor-Piercing, Fin Stabilized, Discarding Sabot, with Tracer (APFSDS-T) M774, M833 and M900.

c. These rounds use a kinetic energy penetrator made from depleted uranium (staballoy). Because of the toxic nature of U238 when ingested into the body, more stringent inspection criteria must be used to assure that no hazard exists to personnel handling the items. Also, the design and material composition of the cartridges represents a departure from previous generations of armor piercing tank ammunition. The design and material configuration warrant special emphasis during the life cycle surveillance of the cartridges. The basic material compositions of projectile components are as follows:

(1) Fin: aluminum (anodized).

(2) Windshield: aluminum (anodized).

(3) Sabot: aluminum (anodized).

(4) Windshield tip: steel.

(5) Penetrator: staballoy (depleted uranium).

(6) Bourrelet: steel.

(7) Sabot seal: rubber (silicon).

(8) Obturator: nylon.

(9) Sealing band: polypropylene.

(10) Bourrelet screws: steel.

J-2. Unique Safety Precautions.

a. Because of the toxic nature of depleted uranium (DU), SOPs will be developed locally to assure that personnel involved in operations with DU rounds are protected from possible ingestion.

b. SOPs should include procedures covering accidents, storage, incidents, and reporting requirements involving rounds containing radioactive (DU) materials. (Reference TB 9-1300-278, Guidelines for Safe Response to Handling, Storage, and Transportation Accidents Involving Army Tank Munitions Which Contain Depleted Uranium).

c. Procedures for commercial transportation of radioactive (DU) materials must fully reflect the applicable requirements of 49CFR173 and AR 350-10, in addition to necessary actions required prior to commercial shipment of explosives. Procedures include a requirement to swipe test the exterior of all pallets and unpalletized outerpacks prior to shipment. Analyze swipe taken on pallet/outerpack according to paragraph J-7.

d. Cartridges are exempted by NRC license from labeling requirements for radiologic material. Shipments must comply with DOT Exemption DOT-E-9649.

e. Projectiles with evidence of damage and/or corrosion will be inspected and swipe (smear) tested for evidence of contamination. The swipe (smear) test will be conducted as specified in paragraph J-7.

f. Personnel handling DU rounds should wear gloves and should not eat, drink, or smoke until hands are thoroughly washed with soap and water.

g. Accidents and incidents involving DU munitions will be reported through the local RPO to the license RPO, addressee in paragraph 1-5.d.(18)(b). These include: theft or loss of control; functioning; fires, explosions, or accidents where DU munitions are, or could be damaged; or damage that exposes or releases DU to the environment.

h. QASAS conducting UBL Inspection at 105mm tank units should assure that only M1 Abrams tank units are in possession of Ctg, 105mm, APFSDS-T, M900.

J-3. Testing and Equipment Requirements.

Table J-1 identifies test and measurement equipment and gaging requirements.

J-4. Inspection Category and Sampling Plan.

a. Inspection category: Category W (five years).

b. Sampling plan for inspection is according to Chapter 2.

c. A stockpile reliability test program will be conducted on cartridges, which will require samples to be selected from specific lots in basic load. Samples will be inspected visually according to Table J-2 of this appendix prior to shipment for test. Inspection results will be annotated on a DA Form 984, and a copy forwarded to the office in paragraph 1-5.d.(20)(h). Sampling intervals will be as prescribed by HQ, JMC.

d. This program is designed to see what effect uploading, handling, and downloading by tank crews have on performance. Both ballistic testing and physical teardown inspection will be performed by designated licensed facilities. DU ammunition samples will not be individually swiped. Only exterior container swipe IAW paragraph J-7n will be done. Samples will be swiped as part of ASRP test.

e. Annual basic load inspections will be performed on cartridges by QASAS according to Chapter 8 and Table J-2. Ammunition contained in basic load stocks will not be rejected for minor correctable defects.

J-5. Specific Inspection Points.

Item will be inspected and classified according to Chapter 2 and Table J-2.

Table J-1. Equipment Identification List.			
Description	NSN	Application	Inspection
Gage, profile and alignment	5220-00-231-2775	Complete cartridge	IRI,RI,PI,UBLI
Proportional counter		As specified in para J-7	IRI,RI,PI,UBLI
Swipe, Cloth, Test	6665-01-198-7573	Swipe Test	IRI,RI,PI,UBLI (Note 2)
Note 1. Profile and alignment gaging required only if not accomplished during IRI, or if round is visibly damaged. (Profile and alignment gaging is required only one time during life cycle of lot.)			
Note 2. Swipe (smear) test will only be performed on damaged and/or corroded projectiles.			

Table J-2. Item Defects and Method of Inspection.			
Classification	Application	Inspection Method	Inspection Description
1. Critical:			
Projectile loose in cartridge case (M900).		Visual/Manual	Para J-6i(4)
2. Major:			
a. Windshield or windshield tip bent or damaged.		Visual	Para J-6a
b. Windshield loose (lateral or longitudinal looseness only).		Visual/Manual	Para J-6a
c. Bourrelet cracked or loose.		Visual/Manual	Para J-6a
d. Missing parts (e.g., bourrelet, obturator, windshield tip bourrelet screws).		Visual	Para J-6a
e. Corrosion on projectile parts (pitting).		Visual	Para J-6a
f. Corrosion of primer as specified by TM 9-1300-251-20&P.		Visual	Para J-6a & J-6c
g. Yellow/yellowish white projectile corrosion.		Visual/Swipe	Para J-6a & J-6d
h. Failure of cartridge to gage.		Gage	Para J-6a & J-6e
i. Damaged inner or outer container.		Visual	Para J-6a & J-6f
j. Hose clamp(s) not removed from sabot.		Visual	Para J-6a
k. Primer or igniter above flush.		Straightedge	Para J-6a & J-6g
l. Primer staking missing.		Visual	Para J-6a & J-6h
m. Obturating band damaged (e.g., cracked, broken, or gouged).		Visual/Gage	Para J-6a
n. Sabot damaged (e.g., cracked, broken, or gouged).		Visual/Manual	Para J-6a
o. Lateral movement of projectile (M774 and M833).		Visual/Manual	Para J-6a & J-6i
p. Rust, metal tears or cracks in cartridge case (M833 and M900).		Visual	Para J-6a
q. Damage to cartridge which may expose DU core.		Visual/Swipe	Para J-6a & J-6d
3. Minor:			
a. Damaged inner or outer container.		Visual/Manual	Para J-6b & J-6f
b. Protective windshield cushion missing.		Visual	Para J-6b

J-6. Inspection Description and Notes.

a. Cartridges having any major defects will be reported according to DA PAM 750-8, regardless of dollar value. Defective quantities that are authorized for repair or demilitarization will be transferred as directed by HQ, JMC, to a facility licensed to perform these procedures.

b. Replacement containers and protective windshield cushion should be requisitioned as required according to the procedures in applicable technical manuals.

c. Refer to paragraph 3-9, TM 9-1300-251-20&P for inspection criteria.

d. Projectile will be swipe tested according to paragraph J-7 if any of the following conditions exist: Corrosion in sabot gaps, windshield interfaces or if physical damage to projectile is noted which could expose DU core.

e. Perform gaging according to Table J-1.

f. Inspect packing material IAW Chapter 2.

g. Testing to date has not shown electric primer assembled to these cartridges to be sensitive to initiation from mechanical impact. Primers or igniters above flush are therefore to be considered major defects rather than critical. (Any straight edge rule is suitable for checking this characteristic.)

h. Primers must be staked in two places, approximately 180 degrees apart. Stakes should show evidence of moving cartridge case material into joint at cartridge case to primer. Stakes on primers with wrench holes will not necessarily deform wrench hole. If there is no evidence of metal deformation at cartridge case and primer joint, perform the following:

(1) Mark a line across primer head and cartridge case.

(2) Apply disassembly torque of 175 inch pounds.

(3) Check line to verify no movement.

i. Surveillance samples with projectiles exhibiting lateral movement are not considered defects unless one or more of following conditions are noted:

(1) Cartridge case deformation preventing profile and alignment gaging or chambering.

(2) Crimp out of groove.

(3) Evidence of propellant dusting on outside of cartridge case or projectile.

(4) There shall be no movement of M900 projectile within the cartridge case; i.e., rotating, wobbling, and/or evidence of an unsecured manner.

J-7. Swipe (Smear) Test.

a. Chance of any DU particles migrating to surface of projectile is considered remote, therefore, swipe test will only be performed under either of the following circumstances:

(1) Damaged cartridge with possible core exposure.

(2) Cartridge with visible corrosion (powdery substance) on sabot, sabot gaps or windshield interfaces.

b. The following safety precautions should be observed when performing swipe test:

(1) Do not eat or drink while swipe testing. Radioactive materials pose the greatest harm if taken internally, such as by ingestion. Keep hands away from face.

(2) Do not perform swipe test with exposed open cuts or sores. Cover any open cuts or sores with bandages and wear protective rubber gloves. Radioactive material can also be taken internally through open cuts.

(3) Do not clean projectile prior to swipe test.

(4) Wash hands thoroughly with soap and water when testing is completed.

c. Fill in information required on front of swipe folder to include date, time, swipe number, location and technician.

d. Swipe does not have to be removed from paper strip during test.

e. Using moderate pressure, wipe surface of projectile along seams between sabot segments and seam of junction between windshield and sabot with swipe. Swipe should also include any area of the projectile with visible powder/corrosion. Use one swipe per cartridge.

f. Once swipe has been taken, care must be taken to prevent cross contamination. Do not touch side of swipe paper that was used for taking swipe.

g. Fold paper strip over once so that swipe is covered. Place swipe in re-sealable plastic pouch.

h. Swipes taken on individual cartridges will be tested for radioactivity with a proportional counter. Proportional counter may be located at a central location, and swipes forwarded for reading. Field locations may use AN/PDR 27 and AN/PDR 60 for identification of gross radiation hazards only. The proportional counter is required to measure limits specified in paragraph j below.

i. Exact procedure for measuring activity will depend upon equipment and facilities available. Each swipe must be marked so that a specific cartridge can be located again. Measurement of activity shall be performed by, or under guidance of, a Health Physicist or Radiation Protection Officer.

j. Activity levels exceeding background by 400 disintegrations per minute (DPM) alpha or 700 DPM beta-gamma may indicate a potential corrosion problem. Although activity levels at these DPM values are not considered to present a health hazard, it is desirable to identify initiation of a corrosion problem long before contamination results.

k. Any cartridge with reading that exceeds established background level by above amounts will be sealed in plastic, and the cartridge will be returned for examination to a facility licensed to disassemble DU cartridges (as directed by JMC).

l. Whenever activity levels exceed 500 disintegrations per minute (DPM) immediately notify the office in paragraph 1-5.d.(18)(b) and in paragraph 1-5.d.(19)(b).

m. A report will also be submitted to the addresses in paragraph l above when any activity levels are measured which exceed background levels of the counter being used by a factor of two. This report will include background and swipe readings; type, serial number, and calibration date of test instrument; and any other information deemed relevant.

n. The following procedure can be used to monitor pallet/outer pack prior to shipment. This procedure is not authorized for individual cartridges.

(1) Swipe at least a 300 square centimeter area of pallet/outer pack.

(2) Check swipe with an AN/PDR 27, 56 or 60 radiac meter, or equivalent. Reading of twice background is indicative of contamination.

(3) If readings indicate contamination, notify offices in paragraph l above.

J-8. References.

a. AR 385-10.

b. DMWR 9-1315-C523-X1.

c. DMWR 9-1315-C524-X20.

d. TB 9-1300-278.

e. TM 9-1300-251-20&P.

f. TM 9-1300-251-34&P.

g. TM 9-2350-305-10.

h. TM 9-2350-356-14.

i. TM 43-0001-28.

APPENDIX K
CARTRIDGE, 4.2 INCH MORTAR

K-1. Item Description.

a. FSC: 1315.

b. Ammunition type: Cartridge, 4.2 inch Mortar. Includes the following models: M328 Series (WP), M329 Series (HE), M335 Series (illuminating), and the M630 (tactical CS). The M2 Series WP or PWP and the M3 Series HE are obsolete and not specifically addressed in this appendix. If these models are encountered they should be inspected and classified using the applicable portions of this supply bulletin as a guide.

c. The 4.2-inch cartridges are spin-stabilized rounds fired from a rifled bore muzzle loading weapon. For a complete description of these rounds, see TM 43-0001-28 and the drawings for the particular round.

K-2. Unique Safety Precautions.

WP cartridges manufactured prior to 1966 may contain bursters loaded with tetrytol. Lots, which contain tetrytol bursters will be placed in condition code F for replacement of bursters. Screening for evidence of explosive growth or exudation prior to issue for use is not considered practical or timely.

K-3. Testing and Equipment Requirements.

a. All IRI samples will be gaged using a profile and alignment gage and concentricity gage. Gaging is not normally required during PI, RI, or UBLI. Gaging, during these inspections (other than IRI), should be limited to individual rounds having visual evidence of damage or other conditions that may preclude loading and firing. Unless the rounds requiring gaging are truly representative of the lot being inspected, they should be disregarded in evaluating the lot.

b. Table K-1 identifies test and measurement equipment.

K-4. Inspection Category and Sampling Plan.

a. Inspection category:

(1) Category U: 7 years - Jungle Pack Practice without Explosive Components (Inert) cartridges.

(2) Category V: 6 years - Jungle Pack HE, WP and Practice with Explosive Components cartridges.

(3) Category W: 5 years - all Illuminating and Regular Pack Practice without Explosive Components (Inert cartridges).

(4) Category X: 4 years - all Chemical, FS Smoke, Leaflet, Riot Control cartridges and Regular Pack HE, WP, RP and Practice with Explosive Components cartridges.

(5) Category Z: 2 years - bulk primers.

b. The sampling plan for inspection is according to Chapter 2.

K-5. Specific inspection points.

Item will be inspected and classified according to Chapter 2 and Table K-2.

K-6. Inspection Description and Notes.

a. All models which have a safe setting, except for Fuze MT M565, when not set on safe is a major defect.

b. All models with fuzes requiring a safety wire or pin.

c. M328 Series with tetrytol bursters (see paragraph K-2).

d. Red face must not be visible.

e. Propellant broken below the seam, or total loss of ⅛ to ½ increment, will be classified a major defect. Propellant broken, but not below the seam, or total loss less than ⅛ increment, will be classified an incidental defect.

f. When a component is damaged to the extent that its functional effectiveness has been destroyed, it will be classified as a defect.

g. Normally done only during initial receipt inspection. Assure that gage flange makes even contact with forward edge of projectile when fully inserted. If possible, establish cause for projectile's failure to gage (such as cocked liner, fuze well liner not fully inserted, foreign matter in threads, damaged threads, etc.).

h. Does not apply to new type plug (polyethylene) which does not require a spacer.

i. Caked explosive in the threads will be classified as a defect. Explosive dust will not be considered a defect.

j. This label which reads "Warning: Remove container extension and reduce propellant to not more than 25 and ½ increments before firing in 4.2 inch mortar M2" is applicable only to the M2 mortar. The M2 mortar was classified obsolete on 13 June 1957, and there are no known weapons in any U.S. inventory. Some allied countries may still be using the M2 mortar; therefore, whenever lots are encountered with missing labels, a remark should be included on the DSR to ensure lot is not shipped FMS or Grant Aid.

k. Obturator.

(1) The obturator bristles must slant clockwise when viewed from the rear of the cartridge.

(2) The bristle strips must be fully seated in the obturator groove with no obvious bulging of the bristle strips above the obturator groove.

(3) Two slits and white dots on the obturator must be oriented towards the rear of the round, the trailing edge of the obturator must be thinner than the leading edge when assembled to the cartridge.

(4) Other obturator damage (including the bristle strips) which would adversely affect the round's fit in the mortar tube or result in obturator failure will be cause for cartridge rejection.

Table K-1. Equipment Identification List.

Description	NSN	Application	Inspection
Gage, profile and alignment.	9278618	5220-01-165-4567	M329A2
Gage, profile and alignment.	7258457	5220-00-313-3091	All except M329A2
Gage, depth and concentricity deep cavity.	7304529	5220-00-395-4479	M329 Series unfuzed

Table K-2. Item Defects and Method of Inspection.

Classification	Application	Inspection Method	Inspection Description
1. Critical:			
a. Excessive number of increments.	All	Visual	
b. Insufficient number of increments.	M328 Series, M329 Series	Visual	
c. Bag loading assembly missing or damaged to the extent that propellant can escape.	M328A1, M329A1, M329A2	Visual	
d. Pressure plate incorrectly assembled (reversed).	M329, M329A1	Visual	Para K-6d
e. WP leakage or evidence of leakage.	M328 Series	Visual	
f. Zone weight markings incorrect.	M328 Series, M329, M329A1	Visual	
g. Fuze not set on safe (except for Fuze, MT, M565).		Visual	Para K-6a
h. Fuze safety wire or pin missing, broken, insecure or improperly engaged.		Visual	Para K-6b
i. Supplementary charge pad missing.	M329 Series (unfuzed)	Visual	
j. Fuze well liner missing.	M329 Series (unfuzed)	Visual	
k. Explosive extends above the top of the fuze well.	M329 Series (unfuzed)	Visual	
l. Fuze well liner not fully expanded and not making contact with fuze well threads for full 360 degrees.	M329A2 (unfuzed)	Visual	
m. Explosive growth of burster.		Visual	Para K-6c
2. Major:			
a. Ignition cartridge missing.	All	Visual	
b. Insufficient number of propellant increments.	M335 Series, M630	Visual	
c. Bag loading assembly missing or damaged to the extent that propellant can escape.	M335A1, M335A2, M630	Visual	
d. Broken or chipped propellant increments.	All	Visual	Para K-6e
e. Any propellant holder missing.	All	Visual	
f. Rear propellant holder improperly seated.	M329A2	Visual	
g. Pressure plate incorrectly assembled (reversed).	M328 Series, M335 Series, M630	Visual	Para K-6d
h. Pressure plate nut not properly staked.	M328 Series, M329, M329A1, M335 Series, M630	Visual	
i. Rotating disc loose or improperly assembled.	M328 Series, M329, M329A1, M335 Series, M630	Visual	
j. Rubber obturator improperly assembled, damaged missing.	M329A2	Visual/Manual	Para K-6k
k. Extension pin missing.	M328A1, M329A1, M335A1, M335A2	Visual	
l. Supplementary charge missing or inverted.	M329 Series (unfuzed)	Visual	
m. Any component missing, damaged or incorrectly assembled (other than described elsewhere).	All	Visual	Para K-6f
n. Misalignment of fuze well liner with center line of projectile.	M329 Series (unfuzed)	Gage	Para K-6g
o. Depth to bottom of fuze well liner minimum.	M329 Series (unfuzed)	Gage	Para K-6g

p. Fuze well liner loose.	M329 Series (unfuzed)	Manual	Para K-6g
q. Fuze not fully seated.	M329 Series (fuzed)	Visual	
r. Glue asphalt, wax or cement on bourrelet area of cartridge.	All	Gage	
s. Supplementary charge not removable by hand or tab is missing.	M329 Series (unfuzed)	Visual	
t. Cartridges fails to freely pass through profile and alignment gage.	All	Visual	Para K-6g
u. Fuze not set on safe.	M565	Visual.	Para K-6a
3. Minor:			
a. Fuze stake missing.	All.(fuzed)	Visual	
b. Supplementary charge spacer missing.	M329 Series (unfuzed)	Visual	Para K-6h
c. Supplementary charge damaged.	M329 Series (unfuzed)	Visual	
d. Explosive on fuze well threads.	M329 Series (unfuzed)	Visual	Para K-6i
e. Shear or twist pin above flush.	M335 Series, M630	Visual	
4. Incidental:			
Warning label missing or unidentifiable.	M328 Series, M329, M329A1, M335 Series, M630	Visual	Para K-6j

APPENDIX L
CARTRIDGES, 120MM M829, M829A1, M829A2, M829A3, M830, M830A1, M831A1, M865, M908, M1002 AND M1028

L-1. Item Description.

a. DODACs and Ammunition Type:

(1) 1315-C380: Cartridge, 120mm, APFSDS-T, M829A1.

(2) 1315-C784: Cartridge, 120mm, TP-T, M831A1.

(3) 1315-C785: Cartridge, 120mm, TPCSDS-T, M865.

(4) 1315-C786: Cartridge, 120mm, APFSDS-T, M829.

(5) 1315-C787: Cartridge, 120mm, HEAT-MP-T, M830.

(6) 1315-C791: Cartridge, 120mm, HEAT-MP-T, M830A1.

(7) 1315-C792: Cartridge, 120mm, APFSDS-T, M829A2.

(8) 1315-CA05: Cartridge, 120mm, HE-OR-T, M908.

(9) 1315-CA26: Cartridge, 120mm, APFSDS-T, M829A3.

(10) 1315-CA31: Cartridge, 120mm, TPMP-T, M1002.

(11) 1315-CA38: Cartridge, 120mm, Canister M1028.

b. M829 Series Cartridges: The M829 series cartridges contain several main components that are of particular concern during surveillance inspections. These components and their basic composition are as follows:

(1) Subprojectile: DU penetrator with aluminum fin, aluminum windshield, and steel windshield tip. The M829A1 has a blunt windshield tip which is not removable. The M829A3 has a non-removable, uncoated, silver steel windshield with a non-separating tip.

(2) Sabot:

(a) M829 - four segment aluminum & anodized.

(b) M829A1 - three segment aluminum & anodized.

(c) M829A2 - three segment composite.

(d) M829A3 - three segment composite w/rings on forward bourrelet.

(3) Centering Band: nylon (M829 only).

(4) Obturator: Nylon.

(5) Combustible Cartridge Case: painted and sealed nitrocellulose.

(6) Combustible Forward Adapter: inert.

(7) Case Base and Seal Assembly (AFT CAP): steel with rubber.

c. M865 Cartridge, TPCSDS-T and M1002 Cartridge TPMP-T:

(1) Subprojectile: steel core (tactical rounds have penetrators, training sabot cartridges have cores) with an aluminum conical fin.

(2) Sabot: aluminum (anodized).

(3) Rear Band: rubber seal (M865 only).

(4) Obturator: nylon.

(5) Combustible Cartridge Case: painted and sealed nitrocellulose.

(6) Case Base and Seal Assembly: steel with a rubber seal.

d. M830 and M830A1, HEAT-MP-T; M908, HE-OR-T and M831A1, TP-T.

(1) Projectile:

(a) M830: steel body and spike with an aluminum boom and fin.

(b) M830A1: three aluminum sabot segments and a steel warhead assembly with a stainless steel proximity switch, ogive, and aluminum fin and boom.

(c) M908: same as the M830A1 except that a solid steel nose cone replaced the proximity switch.

(d) M831A1: aluminum body and steel spike assembly with an aluminum stabilizer.

(2) Centering Band:

(a) M830: copper.

(b) M830A1 & M908: has sabot.

(c) M831A1: nylon.

(3) Combustible Cartridge Case: painted and sealed nitrocellulose. The M830 has a live forward adapter (nitrocellulose).

(4) Case Base & Seal Assembly: steel with a rubber seal.

e. M1028 Cartridge, canister:

(1) Projectile: inert, aluminum two piece body canister with approximately 1097 0.375 inch tungsten balls.

(2) Obturator Band: nylon.

(3) Rear Band: rubber seal.

(4) Combustible Cartridge Case: painted and sealed nitrocellulose.

(5) Case Base & Seal Assembly: steel with a rubber seal.

L-2. Unique Safety Precautions.

a. M829 Series:

(1) Because of the toxic nature of depleted uranium (DU), SOPs should be developed locally to

assure personnel involved in operations with DU rounds are protected from possible ingestion. The SOPs should include procedures covering accidents, incidents, storage and reporting requirements involving round containing radioactive (DU) materials (reference TB 9-1300-278, Guidelines for Safe Response to Handling, Storage, and Transportation Accidents Involving Army Tank Munitions Which Contain DU).

(2) Procedures for the commercial transportation of DU materials must fully reflect the applicable requirements of 49CFR173 and AR 385-10, in addition to the necessary actions required prior to a commercial shipment of explosives.

(3) Cartridges are exempted by NRC license from labeling requirements for radiological material. All shipments must comply with DOT exemption DOT-E-9649.

(4) QASAS will inspect and conduct the swipe (smear) test on projectiles with evidence of damage and/or yellow corrosion for evidence of DU contamination as specified in paragraph L-7.

(5) Personnel handling DU cartridges should wear gloves and should not eat, drink, or smoke until they have thoroughly washed their hands with soap and water.

(6) Accidents and incidents involving DU munitions will be reported through the local Radiation Protection Officer (RPO), to addressee in paragraph 1-5.d.(18)(b). These include: theft or loss of control, functioning, fires, explosions or accidents where the DU munitions are or could be damaged, or damage that exposes or releases DU to the environment.

b. All 120mm Ammunition:

(1) The primer electrode is the mechanism for transferring electrical or radio frequency (RF) energy to the primer to cause initiation. Energy is transferred if only the center electrode of the primer is being touched. During ammunition handling/loading, a hand may contact the aft cap, primer and center electrode at the same time without risk. There is danger when only the center electrode is contacted.

(2) Personnel should not carry any unauthorized wireless/electronic devices when performing uploading, downloading and pre-firing operations.

(3) Tank personnel should never operate any tactical radio in the 200-280 MHz frequency range when performing uploading, downloading and pre-firing operations. If possible, operate the tactical radio in its hopping mode.

(4) Maintain a safe separation distance (SSD) of 30 meters (99 ft) between vehicles/personnel operating UHF radios in the 200-280 MHz range, and operation involving unpackaged tank ammunition.

(5) Always wear gloves (e.g. combat vehicle crewman type, MIL-G-44108) when handling main gun ammunition. The human body absorbs RF energy that could be transferred to the primer electrode.

(6) Never attempt to clean the primer or the primer electrode on the aft face of the cartridge by touching the primer or electrode with any object or tool.

(7) To clean ammunition, wipe it with a dry, clean, soft rag. Do not use abrasive material or cleaning solvent.

(8) Personnel must handle ammunition assembled with combustible cartridge cases carefully. Personnel will avoid damaging or scratching the combustible cartridge case during handling. Handle the cartridge by the metal case base and projectile sabot.

L-3. Testing and Equipment Requirements.

a. Personnel will perform gaging IAW SB 742-1, paragraph 2-8:

(1) Every lot must be gaged at least once during its storage life cycle and results documented on Depot Surveillance Record card.

(2) Whenever possible, QASAS will gage cartridges during initial receipt inspection or at the next scheduled periodic inspection. Gage rounds whenever conditions such as exposure to adverse conditions, deterioration, damage, etc. indicate a need to verify serviceability.

(3) Uploaded M829A2 cartridges may exhibit a chambering problem if they have been exposed to water or a high humidity and high temperature environment such as standing water or visible condensation in the ammunition stowage compartment, or if they have been subjected to unpackaged storage. Chamber gage cartridges using a Man Portable Chamber Gage (MPCG) Set, P/N 12948079, on a monthly basis. P/N 12948079 includes Letter of Instruction for using MPCG. At the same time, QASAS should inspect cartridges for corrosion on the projectile, the case base, and for watermarks on the cartridge.

b. Swipe Test: QASAS will perform swipe test only on damaged or corroded projectiles IAW paragraph L-7.

Table L-1. Equipment Identification List.

Description	Part Number	Application
Man Portable Chamber Gage(MPCG) Set	12948079 NSN: 5280-01-4777-5455	All 120mm Cartridges
Proportional Counter	Commercial Equip	Swipe (Smear) Test
Ring Gage Set	PN: 12900358 NSN: 5220-01-359-3001	All
NOTE: the ring gage set may be used in lieu of the man portable chamber gage, if unavailable.		

L-4. Inspection Category and Sampling Plan.

a. All 120mm cartridge inspection category: Y (3 years, 20 round sample size).

b. This item is included in the Ammunition Stockpile Reliability Program. Prepare test samples IAW Chapter 3. QASAS will not individually swipe DU ammunition samples. QASAS will swipe only exterior PA116/PA171 Shipping & Storage Container IAW paragraph L-7n. Samples will be swiped as part of ASRP test.

c. QASAS will conduct an initial upload inspection when a using unit uploads cartridges during peace time loading.

d. QASAS will perform the annual or semi-annual basic load inspections on cartridges according to SB 742-1, Chapter 8 and this appendix. Ammunition contained in basic load stocks will not be rejected for minor correctable defects.

e. Storage of empty PA116/PA171: containers should be examined to verify that lids are in place and containers protected from the elements.

f. QASAS should report any observed stowage area that could affect serviceability of the ammunition. Examples of such areas are: tank stowage compartments including the hull racks which may have standing water, rust condensation, burred racks, or swing tubes, etc. Report findings to the office in paragraph 1-5.d.(1).

g. QASAS supporting upload operations in conjunction with armored unit deployments should assure that tank stowage compartments are thoroughly dry prior to ammunition upload. QASAS at the receiving end of deployment should assure uploaded ammunition serviceability at earliest opportunity to preclude potential moisture damage to the combustible cartridge case and forward adapter. QASAS must advise the office in paragraphs 1-5.d.(1) and 1-5.d.(20)(a) of any damage or deterioration of ammunition or stowage compartments attributable to moisture damage in transit. Damage reports shall provide the bumper number and unit ID for the affected tank.

h. If M829A2 rounds are uploaded or stored in water or high humidity and high temperature environments outside of their original package, it may result in the round not chambering in the main gun. QASAS shall perform monthly chamber gage inspections, using a MPCG to verify ability of the cartridge to chamber. It is also recommended that M829A1 rounds, which have been exposed to freezing temperatures and rain or water, be chamber gage inspected by QASAS using a MPCG prior to their intended use to verify ability of the cartridge to chamber. This applies regardless of the position of the white mark(s) on the sabot segment. At the same time, QASAS should inspect cartridges for corrosion on the projectile, the case base, and for watermarks on the cartridge.

L-5. Specific Inspection Points.

QASAS will inspect and classify items according to Tables L-2 through L-6.

Table L-2. PA116 and PA171 Shipping and Storage Containers.

Classification	Application	Inspection Method	Inspection Description
1. Critical: none defined.			
2. Major:			
a. Cover Assembly nonfunctional.		Visual	
b. Gasket missing or defective.		Visual	
c. Internal components/packaging missing or defective.		Visual	
d. External components missing or defective.		Visual	
e. Dents greater than ¼ inch deep that prevent cartridge extraction.		Visual	Para. L-6e
f. Perforations/holes.		Visual	
g. Internal components/packaging moisture soaked.		Visual	
h. Markings illegible, precluding proper identification of nomenclature and lot number.		Visual	
i. IM panels perforated/cracked.	M829A3, M1002 and M1028	Visual	
j. IM panel gaskets missing or defective.	M829A3, M1002 and M1028	Visual	
k. Separation of top flange around IM panel.	M829A3, M1002 and M1028	Visual	
3. Minor:			
Protective finish on container body (not rims and rings) with pitted corrosion over 10 percent of surface.		Visual	

Table L-3. Cartridges 120mm APFSDS-T M829 (C786), M829A1 (C380), M829A2 (C792) and M829A3 (CA26).

Classification	Application	Inspection Method	Inspection Description
1. Critical: none defined.			
2. Major:			
a. Failure to chamber/gage.		Gage	Para. L-6f
b. Sabot segments misaligned.		Visual	Para. L-6c
c. Rear obturator cracked/damaged.		Visual	
d. Sabot cracked.		Visual	
e. Front bourrelet rings cracked.	M829A3	Visual	Para. L-6c
f. Cracked cartridge case forward adapter.		Visual	
g. DU corrosion (yellowish or black powder or staining) in sabot gaps and/or windshield interfaces.		Visual	Para. L-7a(2)
h. Corrosion on projectile body causing pitting.		Visual	
i. Projectile partially or completely separated from. the combustible cartridge case.		Visual	Para. L-6h
j. Marks on sabot and windshield not aligned properly.	M829A1	Visual	Para. L-6o
k. Windshield damage (dents, blunt tip etc.).		Visual	Para. L-6g
l. Primer or igniter above flush		Visual/Manual	Para. L-6i
3. Minor:			
NOTE: See Table L-6 for all cartridge case and case base defect criteria.			

Table L-4. Cartridge 120mm TPCSDS-T M865 (C785), TPMP-T M1002 (CA31) and Canister M1028 (CA38).

Classification	Application	Inspection Method	Inspection Description
1. Critical: none defined.			
2. Major:			
a. Rear nylon band defective.	M865	Visual	
b. Sabot cracked.	M865 and M1002	Visual	
c. Missing parts.		Visual	
d. Failure to chamber/gage.		Gage	Para. L-6f
e. Pitting corrosion on projectile assembly.		Visual	
f. Obturator - loose, cracked or other damage which would preclude gas seal.		Visual	
g. Rubber seal on Sabot torn or split.	M865	Visual	
h. Projectile top cap - loose or damaged.	M1028	Visual	
i. Forward body slots – cracked or separation.	M1028	Visual	
j. Projectile rubber seal – split, torn or cracked.	M1028	Visual	
k. Witness marks not aligned/loose forward projectile.	M1028	Visual/Manual	Para. L-6p
3. Minor:			
NOTE: See Table L-6 for all cartridge case and case base defect criteria.			

Table L-5. Cartridges 120mm HEAT-MP-T M830 (C787) and M830A1 (C791), TP-T M831A1 (C784) and M908 (CA05).

Classification	Application	Inspection Method	Inspection Description
1. Critical: none defined.			
2. Major:			
a. Missing parts.		Visual	
b. Copper/nylon band damaged to the point of recluding chambering.		Visual/Gage	
c. Failure to chamber/gage.		Gage	Para. L-6f
d. Spike tip damaged.	M830 and M831A1	Visual	

e. Proximity sensor damaged.	M830A1	Visual	
f. Sabot cracked or pitted.	M830A1 and M908	Visual	
g. Shoulder switch bent or cocked.	M830	Visual	
h. Spike shoulder damaged.	M830	Visual	
i. Projectile rubber seal damaged.		Visual	Para. L-6j
j. Spike Tip loose.	M830	Visual/Manual	
k. Pitting corrosion on projectile.		Visual	
l. Projectile partially or completely separated from cartridge case.		Visual/Manual	Para. L-6h
m. Projectile rotates relative to forward adapter.	M830	Visual/Manual	
3. Minor:			
NOTES: 1. See Table L-6 for applicable combustible cartridge case and case base and seal assembly criteria. 2. *Potential exists for M830 projectile fins to break DIGL-RP stick propellant.			

Table L-6. Combustible Cartridge Cases and Case Base & Seal Assembly, 120mm Tank Ammunition.

Classification	Application	Inspection Method	Inspection Description
1. Critical: none defined.			
2. Major:			
a. Abrasion damage or peeling causing coating to be absent in one continuous area. Yellowish-white nitrocellulose case material exposed in this area totaling 10% or more of the total cartridge case surface (30 sq. in. or 192 sq. cm).		Visual	Para. L-6n
b. Case broken exposing internal propellant containment bag.		Visual	
c. Skive joint (glue joint at case shoulder) separation.		Visual/Manual	Para. L-6q
d. Case base and seal assembly (CBSA) separated from cartridge case body.		Visual	
e. CBSA rubber seal torn or separated.		Visual	
f. Primer above flush.		Visual/Manual	Para. L-6i
g. Primer stake missing or does not engage primer.		Visual	Para. L-6i
h. Corrosion of CBSA with visible pitting.		Visual	
i. Non-removable corrosion on primer.		Visual/Manual	
j. Shoulder or sidewall of case cracked, punctured, dented or split.		Visual	
k. Evidence of moisture damage resulting in a softening or penetration of the combustible ctg. case (CCC) or forward adapter.		Visual/Manual	Para. L-6l
3. Minor:			
a. Abrasion damage/peeling causing coating to be missing in one continuous area. Yellow-white nitrocellulose case material seen on this area totaling more than 0.25 sq/in or 1.6 sq/cm, but less than 10 percent of total surface.		Visual	Para. L-6n
b. Water mark on cartridge.		Visual	Para. L-6l
NOTE: The M830 (C787) has a live forward adapter.			

L-6. Inspection Description and Notes.

a. Remove the safety pin securing the front fuze blast guard. Remove the blast guard. Check that the S/A indicator is in the safe position. Check that the retaining clip is present, serviceable and properly installed. Reinstall the blast guard and safety pin to the front fuze.

b. Sabot segment gaps are permissible provided that the cartridge can be chambered.

c. The M829 projectile contains a forward nylon-centering band composed of four individual segments attached to sabot petal. The gaps between centering band segments are aligned with sabot segment gaps. The M829A1 projectile does not contain a forward centering band. The M829A3 contains a composite ring composed of three segments attached to the

petals. A blue adhesive is used to bond the ring. Adhesive is visible.

d. The M829, M829A1, M829A2, and M829A3 projectile assemblies contain a Depleted Uranium (DU) fin stabilized penetrator. The M829 series sub projectiles consist of a penetrator, windshield, and fin. The number of sabot petals and their composition material vary. The M865 TPCSDS-T projectile assembly consists of a steel core encased in three aluminum sabot segments attached to rubber obturator and steel stabilizer.

e. Container dents that are less than ¼ inch do not require repair. Dents greater than ¼ inch that impair the structural integrity of the PA116 container or prevent the removal of the cartridge are major defects. A cartridge that cannot be removed from the PA116/PA171 shipping and storage container shall be placed in CC-F and reported by ACR with info copy by email to the office in paragraph 1-5.d.(1). Cartridges removed from damaged containers that evidence dented cartridge cases shall be placed in CC-H and reported by ACR as above.

f. Perform chamber gaging according to paragraph L-3. Standard ring gage set may be used in absence of man portable chamber gage. NOTE: Ring gages will detect oversized conditions for their specific profile dimension. However, gaging with projectile and case ring gages will not detect an out of alignment condition at the mating point of the projectile assembly and cartridge case forward adapter. Therefore, where available, the MPCG is the preferred gaging method to properly verify the entire profile and alignment of a 120mm cartridge.

g. Any deformity (such as tip bluntness or off center displacement) of the windshield tip may affect the aero-ballistic performance of the sub projectile.

h. Samples with projectiles exhibiting movement in relation to the cartridge case are not considered defects unless one or more of the following conditions are also noted:

(1) Cartridge deformation (profile mis-alignment) preventing gaging or chambering.

(2) Evidence of propellant dusting on outside of cartridge case or projectile.

(3) The affected cartridge is either an M829A2 (C792) or M830 (C787) or M829A3 (CA26) with stick propellant that could become damaged by the movement of penetrator fins or projectile boom/fins.

i. Testing has demonstrated that the electric primer assembled to the round is insensitive to initiation by mechanical impact. Therefore, primers and igniters above flush are considered major defects, rather than critical. Any straight edge rule is suitable for checking primers for an above flush condition. The primer shall be staked to the case base. For lots manufactured CY02 and later, the stake shall be a single indentation applied to the case base and material must be displaced into the primer. For lots manufactured before CY02, absence of primer stake or primer stakes that do not clearly engage the primer are not considered defective if primer is not loose.

j. Any cut, nick, or gouge in the projectile rubber seal (M830 or M831A1) more than one half the width or more than 2 inches in circumference shall be cause for rejection.

k. Moisture noted within PA116/PA171 containers indicates ammunition was either wet when containerized or the interior components of the PA116/PA171 were wet when the ammunition was packed out. Containers with wet interior projectile supports and spacers are considered unserviceable until the moisture intrusion condition is corrected. Cartridges found in such containers must be closely examined for moisture damage according to the applicable tables.

l. QASAS will inspect cartridge cases for evidence of moisture, dents, or penetration. Defects can result from packaging or the cartridge not being dry at time of packaging, upload, and download operations during inclement weather, or exposure to standing water or heavy condensation in the bustle and hull ammunition storage racks. Inspect for water damage, soft cartridge cases, and forward adapters which easily deform under hand pressure, water marks indicating case exposure to standing water and metal parts rust or corrosion.

m. A windshield with a single longitudinal crack less than two inches in length is considered an incidental defect.

n. Cartridge cases that have yellowish-white combustible material showing, less than 10 percent of the total surface area of the cartridge case, will be touched up IAW procedures contained in TM 9-1300-251-34&P. If facilities and manpower are not available to perform the touch up, the rounds will be reclassified to Condition Code E.

o. The projectiles are marked with white alignment marks on the sabot and windshield. There are two marking schemes. The first scheme has one mark on the sabot and one on the windshield. The two marks must either align perfectly or be offset by no more than the width of the mark. The second marking scheme has two marks on the sabot and one mark on the windshield. The windshield mark must be positioned between and not overlap the marks on the sabot (refer to the alignment schemes with Accept/Reject Criteria and Sabot/Windshield Marks Alignment Procedure in TM 9-1300-251-24&P.

p. Assure the witness marks on the projectile (2 short white lines, one on the aft body and one on the forward body) located approximately one inch above the white nylon obturator band are aligned one above the other. If the witness marks are not present, manually grasp both the forward and aft projectile bodies and attempt to turn them in opposite directions. Any movement of the projectile forward body relative to the aft body is a defect.

q. Each inspected cartridge must be placed on a table and the integrity of the skive joint seal verified by a moderate hand pressure circular twist. Any movement of the cartridge case adapter (the tapered section between the projectile and the cartridge case) relative to the cartridge case is a defect. No tools will be used for this manual inspection.

L-7. Swipe (Smear) Test.

a. A swipe test is performed on a DU cartridge exhibiting external evidence of any DU corrosion or particles migrating to the surface of the sabot. Due to the extremely tight fit of the sabot segments, the potential for DU migration is considered to be very remote. Therefore, a swipe test shall only be performed under either of the following circumstances:

(1) Damaged M829 series cartridge resulting in an exposed penetrator.

(2) Cartridge with visible DU corrosion (yellowish or black powder or staining) on sabot, between sabot gaps or windshield interfaces.

b. The following safety precautions should be observed when performing a swipe test:

(1) Do not eat or drink while performing swipe testing. Radioactive ALPHA materials pose the greatest harm if taken internally, such as by ingestion. Inspectors should keep their hands away from their face.

(2) Do not perform swipe test with any exposed open cuts or sores. Cover any open cuts or sores with bandages and wear protective rubber gloves. Alpha radiation material can also be taken internally through open cuts.

(3) Do not clean suspect DU projectiles prior to a swipe testing.

(4) Wash hands thoroughly with soap and water when testing is completed.

c. Fill in information required on front of swipe folder to include date, time, swipe number, location, and technician.

d. Swipe does not have to be removed from the paper strip during test.

e. Using moderate pressure, wipe surface of the projectile along the seams between sabot segments and seam of junction between windshield and sabot with swipe. Swipe should also include any area of the projectile with visible powder/corrosion. Use one swipe per cartridge.

f. Using moderate pressure, wipe surface of the projectile along the seams between sabot segments and seam of junction between windshield and sabot with swipe. Swipe should also include any area of the projectile with visible powder/corrosion. Use one swipe per cartridge.

g. Fold paper strip over once so that swipe is covered. Place swipe in resealable plastic pouch.

h. Swipes taken on individual cartridges will be tested for radioactivity with a proportional counter. The proportional counter may be located at a central location and swipes forwarded for reading. Field locations may use an AN/PDR 60 or equivalent for identification of gross radiation hazards only, but these are not substitutes for the proportional counter required to measure limits specified in paragraph j below.

i. The exact procedure for measuring activity will depend upon the equipment and facilities available. Each swipe must be marked so that a specific cartridge can be located again. Measurement of activity shall be performed by or under the guidance of a Health Physicist or Radiation Protection Officer.

j. Activity levels exceeding background by 400 disintegrations per minute (DPM) alpha or 700 DPM beta gamma, may indicate a potential corrosion problem. Although activity levels at these DPM values are not considered to present a health hazard, the initiation of a corrosion problem needs to be identified long before actual contamination results.

k. Any cartridge with a reading that exceeds the established background level by above amounts will be sealed in plastic, and the cartridge will be returned for examination to a facility licensed to disassemble DU cartridges as directed by the office in paragraph 1-5.d.(18)(b).

l. Whenever activity levels exceed 500 DPM, the following will be immediately notified: (e-mail reporting is acceptable) the office in paragraphs 1-5.d.(20)(h) and 1-5.d.(19)(b).

m. QASAS will also submit a report to the above addresses in paragraph l when any activity levels are measured which exceed background levels of the counter being used by a factor of two. This report will include the background and swipe readings; type, serial number, and calibration date of test instrument, and any other information deemed relevant.

n. Following procedure can be used to monitor pallet/outer pack prior to shipment. This procedure is not authorized for individual cartridges:

(1) Swipe at least a 300 square centimeter area of pallet/outer pack using the procedures outlined at subparagraphs c through k above.

(2) Check the swipe with an AN/PDR 27, 56, or 60 radiac meter, or equivalent. Readings of twice background is indicative of contamination.

(3) If readings indicate contamination, suspend shipment of the contaminated item(s) and notify offices in subparagraph l above.

(4) The analysis using a proportional counter is required regardless of the results of the field instrument check.

L-8. References.

a. AR 385-10.

b. TB 9-1315-257-12.

c. TB 9-1300-278.

d. TM 9-1300-251-20&P.

e. TM 9-1300-251-34&P.

f. TM 9-2350-264-10-1/2

g. TM 9-2350-288-10-1/2.

h. TM 9-2350-388-10-1/2.

i. TM 43-0001-28.

APPENDIX M
LAUNCHER AND CARTRIDGE, 84MM, HE M136 (AT4)

M-1. Item Description.

a. FSC: 1315. NIIN 01-245-4950 or 01-486-2293.

b. Ammunition Type: Launcher and Cartridge, 84mm, HE: M136 (AT4).

c. The M136 (AT4) is a fully self contained, lightweight, man-portable, right shoulder fired anti-armor weapon. The M136 consists of a free-flight fin stabilized projectile packaged and sealed in an expendable launcher. The launcher serves as a transport and storage container. It is issued as a complete round of ammunition.

d. Firing is mechanical. The rearward motion of the firing rod strikes a pin and initiates the percussion cap; the firing train is relayed to the propellant charge. The propellant charge is completely burned prior to the departure of the projectile from the launch tube.

e. The weapon's projectile is a ballistic trajectory fin stabilized Octol (HMX/TNT) shaped charge. The base fuze incorporates an out of line rotor which aligns the detonator with the explosive train 15-25 meters from the muzzle after firing. The Piezoelectric crystal generates voltage to initiate explosive train upon impact at angles as slight as 10 degrees.

f. The launch tube is a glass-fiber reinforced plastic 84mm smoothbore full caliber barrel. Tube consists of a rear aluminum venturi, fire-through muzzle cover, firing mechanism, fixed front and adjustable rear sight assemblies, face pad, shoulder stop and carrying sling.

g. The projectile is factory pressed and cemented into a cartridge assembly consisting of an aluminum case, base plate, 365 grams of double base propellant, percussion primer and igniter. The cartridge is factory loaded into launch tube.

h. The M287 9mm subcaliber training weapon provides M136 weapon system familiarization and training. The M287 is similar in function and appearance to the M136 tactical system except for a gold colored band (indicating trainer), lack of muzzle cover, and presence of a 9mm barrel and bolt assembly in rear venturi (in lieu of projectile and cartridge assembly). The M287 utilizes the M939 9mm tracer cartridge (1305-A358) to simulate the ballistic trajectory of the tactical round. The M939 is marked with a red tip and one-half black base. The M939 cartridge will be inspected per the appropriate sections of this supply bulletin. The M287 trainer is considered a weapon, not ammunition (FSC 6920).

i. Stock number of expended launcher is 1315-01-273-9352, DODIC CX01.

M-2. Unique Safety Precautions.

The M136 (AT4) weapon system is a preloaded recoilless gun equivalent to a propulsive high explosive rocket. Due to the propulsive state of the M136 weapon system, orientation of muzzle (nose end) during handling, transport and storage will be according to the procedures established for propulsive state rockets.

M-3. Testing and Equipment Requirements.

None identified.

M-4. Inspection Category and Sampling Plan.

a. Inspection category X. Periodic inspection interval 4 years.

b. Sampling plan will be IAW Chapter 2.

c. No storage monitoring inspection is required.

M-5. Specific Inspection Points.

Item will be inspected IAW Chapter 2 and Table M-1. Item is packed in a transparent barrier material and will not normally be opened for purposes of inspection.

NOTE

Inspector must verify that the serial number on the round matches that on the outer pack. Annotate serial numbers, findings and any discrepancies on the DSR; report any discrepancies to the local accountable officer.

M-6. Inspection Description and Notes.

a. If accessible, inspection will verify serviceability of the sight, hinge pin and spring.

b. Early production units were color coded with a black band on the launch tube and marked with FSC 1340; later production is marked with a yellow band on a black band on launch tube and FSC 1315.

c. When component is damaged to the extent that functional effectiveness has been degraded, condition will be classified as a defect.

d. If the weapon is returned after removal from barrier bag, a complete visual inspection will be performed. If otherwise serviceable, weapon will be designated for priority issue. While barrier material is normally considered water and vapor proof, material that comprises the M136 “flat bag” is not vapor proof.

e. A rattling noise from fin assembly inside launch tube is not a defect.

f. Ensure two pieces of fiberglass tape are present, secure and serviceable. The fiberglass tape secures the rear sight assembly and the safety catch lever to the launcher tube.

g. The following NSNs are obsolete and are not to be used to identify AT4s:

(1) 1340-01-211-3595; DODIC: H584.

(2) 1315-01-324-3055; DODIC: C995.

M-7. References.

a. DWG 13229861.

b. DWG 13230240.

c. TM 9-1055-886-12&P.

d. TM 9-1315-886-12.

M-8. Shelf Life.

Indefinite.

Table M-1. Item Defects and Method of Inspection.			
Classification	Application	Inspection Method	Inspection Description
1. Critical:			
a. Transport safety pin missing or ineffective.		Visual/Manual	
b. Cocking lever in cocked (not safe) position, broken or missing.		Visual/Manual	
c. Muzzle cover ruptured with obstruction (cover or foreign material) in bore of launch tube.		Visual	
d. Launch tube perforated, broken, cracked, crazed, dented, bent, gouged or white fiberglass visible.		Visual	Para M-6e
e. Broken and/or missing fiberglass tape.		Visual	Para M-6f
2. Major:			
a. Sight covers or sight assemblies damaged or missing.		Visual/Manual	Para M-6a
b. Markings or warning labels missing, illegible or incorrect.		Visual	Para M-6b
c. Any part of weapon missing, damaged, or inoperative (except as otherwise noted).		Visual/Manual	Para M-6c
d. Barrier bag missing or damaged to extent environmental protection is compromised.		Visual	Para M-6d
e. Packaging damaged to extent that contents are not adequately protected.		Visual	
f. Venturi obstructed or foreign material present.		Visual	
3. Minor:			
a. Packaging hardware damaged, missing, or inoperative.		Visual/Manual	
b. Packing loose, filler material inadequate or missing.		Visual/Manual	
c. Carrying strap damaged, deteriorated or missing.		Visual/Manual	

APPENDIX N
PROJECTILE, 155MM, ICM FAMILY

N-1. Item Description.

a. FSC: 1320.

b. Ammunition type: Projectile, 155mm HE, Improved Conventional Munitions (ICM). Includes model numbers M483A1, M692, M718, M718A1, M731, M741, M741A1 and M1122.

c. The M483A1 family of projectiles has metal parts comprised of four main components (less cargo). The components and basic material compositions are as follows:

(1) Ogive: aluminum (alodined).

(2) Body: steel/fiberglass.

(3) Base: aluminum (anodized).

(4) Fusible lifting plug: steel.

d. The design and material composition of the M483A1 family represents a departure from previous generations of artillery ammunition. These design and/or material changes warrant special emphasis during the life cycle surveillance of these munitions. Areas of emphasis are specified in paragraph N-5 of this appendix. For a complete, detailed description of the M483A1 family, see TMs and drawings.

e. Projectile models M483A1, M692 and M731 are thin based projectiles. The aluminum bases on these models, manufactured prior to April 1988, are susceptible to stress corrosion cracking, evidenced by surface corrosion. Projectiles with base corrosion or stress corrosion cracks may malfunction inbore. New production bases are of an improved aluminum alloy which is less susceptible to stress corrosion cracking. New style bases are identified by black color and by the projectile's NSN. The improved alloy will be used in new production and replacement bases for all ICM projectiles, both thin based and remote anti-armor mine system (RAAMS). Appropriate stock numbers are provided in Table N-1.

N-2. Unique Safety Precautions.

Exercise extreme care when handling a projectile with an exposed or damaged cargo of sub-missiles (grenades or mines) or a loose base. Sub-missiles can fall out, arm, and explode with lethality of a fragmentation hand grenade.

N-3. Testing and Equipment Requirements.

Table N-2 identifies test and measurement equipment and gaging requirements. Ring and gap gaging will be conducted during IRI IAW Chapter 2 and appropriate drawings and specifications. Subsequent gaging will only be performed on those projectiles showing evidence of damage.

N-4. Inspection Category and Sampling Plan.

a. Inspection Category W, Periodic Inspection interval - five years.

b. Sampling plan for inspection is IAW Chapter 2.

N-5. Specific Inspection Points.

Item will be inspected and classified according to Chapter 2 and Table N-3.

N-6. Inspection Description and Notes.

a. The gap between base and body interface will be gaged with a blade type feeler gage as follows:

(1) M483A1 projectile. Base gap criteria varies with drawing revision under which projectile was assembled. Projectiles manufactured according to drawing 9215220, revision K, or subsequent revisions, require base gap not to exceed 0.003-inch. Projectiles assembled according to drawing revisions prior to revision K require base not to exceed 0.010 inch. Round will be rejected if appropriate thickness feeler gage enters gap more than 0.060-inch depth (approximately 1/16 inch) for 360 degrees, or for 0.125-inch depth (approximately ⅛ inch) in one continuous 45-degree arc along base and body joint.

(2) M692 and M731 projectiles. Reject round if a 0.005-inch feeler gage enters gap for more than 0.060-inch depth for more than 180 degrees continuous arc along base and body joint.

(3) M718 and M741 projectiles. Reject round if a 0.023-inch feeler gage enters gap for more than 0.060-inch depth for more than 180 degrees continuous arc along base and body joint.

(4) M1122 projectiles. Reject round if a .003-inch feeler gage enters gap more than .060-inch depth for 360 degrees.

(5) All projectiles: accept or reject criteria will be 0 and 1 respectively. Occurrence of one defective sample will require the lot to be locally suspended from issue and use. Lot should be scheduled for 100% screening for excessive base gap. Details (including actual gap and circumferential measurements) will be reported immediately to the office in paragraph 1-5.d.(1). Rejects are to be tagged and identified in storage pending receipt of disposition instructions.

(6) Sealant was used to fill base/body gap for later production and base replacement using black bases. Projectiles with sealant in this gap will not be gaged.

b. Fusible plug is painted yellow for identification purposes.

c. Projectiles that fail to ring gage will be measured with a micrometer to determine if the diameter is within tolerance at all points. Take micrometer readings 90 degrees apart in areas which fail to ring gage, then rotate micrometer completely around circumference of projectile to determine if diameter is within 6.0900 - 6.0984 inches at all points. Reports submitted per paragraph 2-8g of this supply bulletin will include micrometer readings.

d. Fiberglass wrap damage criteria is as follows:

(1) Missing olive drab (OD) paint on fiberglass is not a cause for rejection. Projectiles having paint missing on portions of the fiberglass wrap (i.e., due to rubbing) shall be touched up with OD paint. (Color No. 34088, MIL-E-52891).

(2) Projectiles having longitudinal gouges greater than one inch in length and a full length depth

of 0.100-inch or more shall be rejected. Other longitudinal gouges shall have loose strands trimmed and be touched up with OD paint.

(3) Projectiles having loose strand(s) regardless of circumferential length resulting in a depth of less than .0625-inch and not exceeding .500-inch longitudinal width shall have loose strands trimmed and be touched up with OD paint.

(4) Projectiles having circumferential gouges greater than one inch in length with a full length depth of 0.100-inch or more and greater than 0.250-inch longitudinal width shall be rejected. All others shall have loose strands trimmed and be touched up with OD paint.

e. There shall be no movement when a rocking or rotating motion is applied to the ogive by hand.

f. Markings.

(1) M483 and M483A1 - diamonds.

(2) M731, M741 and M741A1 - triangles with 'S' (short mine self-destruct time).

(3) M692, M718 and M718A1 - triangles with 'L' (long mine self-destruct time).

(4) M1122 - squares.

g. The following procedures apply to inspection for base corrosion on projectile bases:

(1) Corrosion on the new style base will be classified as an incidental defect. Rust in the base/body gap will be classified a minor defect if the gap meets tolerance as reflected in paragraph N-6a.

(2) Remove the grommet and visually inspect the area at base/body joint for rust or corrosion and the entire base for corrosion. White aluminum oxide and roughening or pitting of base surface indicates aluminum corrosion.

(a) If necessary for inspection, clean external surface of base with a clean, lint-free rag or soft brush. Do not use a wire brush or any material that may abrade coating on base. Damage to coating may contribute to development of corrosion during long-term storage. Alcohol (i.e., methyl, ethyl, or isopropyl) may be used sparingly as a cleaning agent. Do not use chlorinated or petroleum based agents (e.g., gasoline, mineral spirits, acetone, ketone, etc.). Obturator ring between rotating band and base is made of polyvinyl chloride (PVC), which may be damaged by exposure to improper solvents. Damage may not be immediately apparent, but such exposure could cause obturator to break during long-term storage.

(b) Re-inspect any area in question to establish if coating surface is intact (not pitted). If coating is intact, area is not a defect. Surface irregularities may be present, including nicks and pings with aluminum base material displaced. Condition is a common result of manufacturing or handling and should not be considered a defect if corrosion is not present. If corrosion has blossomed (raised material resulting from corrosion formation), base is defective and must be classified according to Table N-3.

(c) Red or brown discoloration on the base is generally a result of rust on projectile surfaces or in the base/body gap and should be treated as an incidental defect.

(3) If damage to the coating on the base with no indication of corrosion is noted during inspection, a touch-up coating shall be applied to bare spots as follows:

(a) Clean touch-up area with alcohol immediately prior to finishing operation.

(b) Apply a thin coat of wash primer DOD-P-15328, NSN 8010-01-124-8193 or 8010-01-127-6896. Allow 15 minutes minimum to two hours maximum drying time for primer.

(c) Apply enamel, color number 34088 of FED-STD-595, MIL-E-52891, NSN 8010-00-848-9272, 8010-00-297-2116, or 8010-00-297-2113. Allow one hour or more to dry enamel. Drying time may be minimized by application of heat and/or forced air.

(4) Take the following action when corrosion on old style bases is detected:

(a) Report any lot rejected due to base corrosion to HQ, JMC as required by this supply bulletin and DA PAM 750-8. This defect is considered to be a factor of environment. Lots will not be suspended worldwide based on reports of base corrosion.

(b) Lots rejected due to base corrosion will be retained in an unserviceable condition code, not authorized for emergency combat. As a rule, it is desirable to perform a 100 percent screening of rejected lots when identified. If local authorities determine that screening is not immediately required, defective lot will be scheduled for base replacement.

h. Remove pallet tops and inspect that portion of aluminum ogive that is in contact with pallet top for corrosion or pitting. This area is especially prone to removal of protective alodine finish.

i. Inspect fusible plugs for bent or cracked lifting ring, dislodged or missing fusible disc or possible leakers. Leakers are recognizable by a ring of rust or cracked paint around periphery at interface of disc and hole.

j. Do not reject a lot for deformed, cracked or deteriorated rubber gaskets, PN 8860552. Replace defective rubber gaskets encountered during inspection.

k. A cut across the entire width and to a depth of more than half the height of band above body surface. (Depth of cut not to exceed 1/16-inch). Hairline cracks, which are a result of the production process, are acceptable.

l. Inspect closely for onset of corrosion, especially on aluminum parts.

m. Rust in the base/body gap will be classified a minor defect if no base corrosion is in evidence and the gap meets tolerance as reflected in paragraph N-6a.

n. M483A1, M692, and M731 with old style base.

o. M718 and M741 with old style base.

Table N-1. Projectile Stock Numbers.

Model	Old Style Base	New Style Base
M483A1	1320-00-126-7339-D563	1320-01-260-8720-D563
M692	1320-00-434-8856-D501	1320-01-261-6043-D501
M731	1320-00-434-8861-D502	1320-01-260-8719-D502
M718	1320-01-050-6059-D503	1320-01-268-0387-D503
M718A1	1320-01-151-9849-D515	1320-01-269-2257-D515
M741	1320-01-050-7966-D509	1320-01-268-0386-D509
M741A1	1320-01-150-7857-D514	1320-01-268-0385-D514
M1122	1320-01-579-6145-DA51 (Green)	1320-01-579-6145-DA51 (Black)

Table N-2. Equipment Identification List.

Description	Model	Application	Requirements
Gage, Ring	All	Upper and lower bourrelet	Para N-3
Micrometer	All	Bourrelet gage failure area	Para N-3
Gage, Feeler, Blade Type	All	Base and body interface	Para N-3
Gage, Depth	All	Fiberglass wrap and rotating band	Para N-3
* Use gage, ring, P/N 7304558, NSN 5220-00-395-4487			

Table N-3. Item Defects and Method of Inspection.

Classification	Application	Inspection Method	Inspection Description
1. Critical:			
Corrosion on base.	Para N-6n	Visual	Para N-6g
2. Major:			
a. Excessive base gap.	All	Gage	Para N-6a
b. Lifting plug wrong type (not fusible).	All	Visual	Para N-6b
c. Diameter of bourrelet greater than maximum allowed.	All	Gage	Para N-6c
d. Fiberglass wrapping damaged or loose.	All	Visual/Gage	Para N-6d
e. Loose ogive at ogive and body joint.	All	Manual	Para N-6e
f. Diamond, square or triangle marking missing, incorrect or unidentifiable.	All	Visual	Para N-6f
g. Corrosion on base (old style base).	Para N-6o	Visual	Para N-6g
h. Corrosion on ogive.	All	Visual	Para N-6h
i. Obturator missing or damaged.	All	Visual	Para N-6i, Para N-6h
j. Lifting plug missing or damaged.	All	Visual	
k. Corrosion on fuze well threads.	All	Visual	
l. Expulsion Charge, not removable, or torn allowing propellant leakage.	All	Visual	
m. Missing expelling charge.	All	Visual	
n. Supplementary charge missing or inverted, felt pad missing at bottom of supplementary charge, or explosive exudation in fuze well liner.	All	Visual	
3. Minor			
a. Rotating band damaged.	All	Visual	Para N-6k
b. Protective coating with bare areas exceeding ¼-inch square.	All	Visual	Para N-6l
c. Rust in base and body gap.	All	Visual/Gage	Para N-6m
4. Incidental:			
a. Corrosion on base (new style base).	All	Visual	Para N-6g
b. Expulsion charge cup loose or removable by hand.	All	Manual	

APPENDIX O
PROJECTILE, 155-MM, HEAT, M712 AND M823

O-1. Item Description.

a. FSC: 1320.

b. Ammunition Type: Projectile, 155mm HEAT, Cannon-Launched, M712 (Copperhead) and Projectile, 155mm Training, M823.

c. Item is a separate loading, laser-guided, high explosive projectile, M712 (Copperhead). Dummy projectile, M823 is a training item designed to train weapon crews in handling M712.

O-2. Unique Safety Precautions.

No unique safety precautions are applicable to this item.

O-3. Testing and Equipment Requirements.

No gaging or special testing is planned as part of the ammunition surveillance portion of the ASRP for this projectile. Extensive laboratory testing and detailed ballistic testing will be the primary source of data for reliability estimates according to AR 702-6.

O-4. Inspection Category and Sampling Plan.

a. RI will be accomplished IAW Chapter 2 and criteria contained in Tables O-1 and O-2. Container will not remain open for more than 72 hours. Prolonged exposure to environmental humidity will cause excessive damage to the projectile and possible degradation in reliability.

b. PI inspection is not required. In lieu of a PI, storage monitoring (SMI) of the M712 will be performed every 3 months. SMI will consist of 100 percent verification of the humidity indicator. Replacement, if indicated, will be performed according to TM 9-1300-251-34&P. Whenever the container is opened for replacement of desiccant, an inspection of the projectile will be performed according to Table O-2 and results noted on the DSR.

O-5. Specific Inspection Points.

Container and projectile will be inspected according to Chapter 2, Tables O-1 and O-2 (as appropriate). Opening of samples will be performed in such an environment as to limit possibility of moisture entering the container. These inspections will not be performed during periods of high humidity, (such as rainstorms). The time a container remains open or a projectile is removed from container will be kept to a minimum necessary to perform inspection. Accept or reject for the inspection of projectile and inner pack will be 0 and 1 respectively for critical, major and minor defects. Outer pack accept or reject will be IAW Chapter 2.

O-6. Inspection Description and Notes.

a. Humidity indicator.

(1) If 40-percent sector on the humidity indicator is not blue for M712, desiccant will be changed according to TM 9-1300-251-34&P.

(2) The M823 training projectile container should not contain desiccant. If present, desiccant should be removed during IRI. The humidity indicator card will be marked "Dummy" and placed in humidity indicator unit.

b. The splice screws should be finger tight and at or below flush with the projectile surface.

c. Access cover missing; screw on cover loose and cannot be made finger tight by hand turning. Screws must be at or below flush with the cover surface.

d. Wings extended indicate squib has been fired.

e. Switches must rotate freely when firing codes are being set into projectile.

f. Decals are no longer required on Copperhead containers. However, container top and bottom are a matched set, identified by serial numbers and should be assembled as one unit. Mismatched top and bottom may prevent container from retaining seal against humidity. Serial number may be found on a decal or marked with stencil ink. If decal is peeled off, replace with stencil. If both top and bottom are missing or unidentifiable, stencil both top and bottom with prefix "CNTR" followed by projectile serial number.

Table O-1. Metal Container Exterior.			
Classification	Application	Inspection Method	Inspection Description
1. Critical: None defined.			
2. Major:			
a. 40-percent sector on humidity indicator is not blue.	M712	Visual	Para O-6a
b. Stiffening ribs damaged.	All	Visual	
c. Damaged latches.	All	Visual	
d. Damaged or loose humidity indicator.	M712	Visual	
e. Loose or broken handles.	All	Visual	
f. Container dented to the extent that contents are not protected.	All	Visual	
3. Minor:			
a. Rust or paint deterioration.	All	Visual	
b. Container dented to the extent that contents are still protected.	All	Visual	
4. Incidental:			
Container serial number missing or illegible	M712	Visual	Para O-6f

Table O-2. Projectile and Container Interior.			
Classification	Application	Inspection Method	Inspection Description
1. Critical:			
a. Evidence of composition B leakage.	M712	Visual	
b. Cracked or deeply gouged obturator.	M712	Visual	
2. Major:			
a. Aft closure damaged to extent that it would prevent engagement of extractor.	M712	Visual	
b. Missing or loose splice screws.	M712	Visual	Para O-6b
c. Loose or missing access cover.	M712	Visual	Para O-6c
d. Broken, cracked, or missing projectile ogive.	M712	Visual	
e. Crack or dent in any part of projectile body.	M712	Visual	
f. Wings extended.	M712	Visual	Para O-6d
g. Fins are loose, broken, or not in retracted position.	M712	Visual	
h. Water droplets condensed or fogged on interior surface of nose cone.	M712	Visual	
i. Window portion of projectile ogive (nose cone) severely scratched or gouged.	M712	Visual	
j. Dirt, debris, or foreign objects in wing or fin slots.	M712	Visual	
k. Dials on code or time switches missing, broken, or illegible.	All	Visual	Para O-6e
l. Excessive rust or pitting of bourrelet.	All	Visual	
m. Switch bracket broken or damaged.	All	Visual	
n. Cracked or deeply gouged obturator.	M823	Visual	
o. Missing plastic inserts (preload tabs).	All	Visual	
p. Internal pressure pads missing, damaged or deteriorated.	M712 Cntr	Visual	
q. Cradle pads missing, loose or damaged.	All Cntrs	Visual	
r. Stitching loose or missing.	All Cntrs	Visual	
s. Straps ripped or broken.	All Cntrs	Visual	
t. Damaged, leaking or missing gasket.	M712 Cntr	Visual	
3. Minor:			
a. Abrasions or smudges on window portion (nose cone) of projectile ogive.	M712	Visual	
b. Water droplets on or fogging interior surface of projectile ogive (nose cone).	M823	Visual	
c. Window portion of projectile ogive (nose cone) abraded smudged, scratched or gouged.	M823	Visual	
d. Dirt, debris or foreign objects in wing or fin slots.	M823	Visual	

APPENDIX P
SMOKE AND INCENDIARY GRENADES

P-1. Item Description.

a. DODACs: 1330-

G869	G932	G950
G872	G935	G955
G874	G937	G982
G900	G940	GG25
G930	G945	

b. Ammunition Type:

(1) Grenade, Hand, Smoke, M18.

(2) Grenade, Hand, Smoke, HC, AN-M8.

(3) Grenade, Hand, Smoke, WP, M15.

(4) Grenade, Hand-Rifle, Smoke, WP, M34.

(5) Grenade, Hand, Smoke, Colored, M48.

(6) Grenade, Hand, Incendiary, TH3, AN-M14.

(7) Grenade, Hand, Smoke, TA, M83.

(8) Grenade, Hand, Smoke, Visual, Restricted Terrain, M106.

c. Grenade, Hand, Smoke, HC, AN-M8 (G930). This is a burning type grenade used to generate white smoke for screening activities of small units. It is also used for ground-to-air signaling. The grenade body is a cylinder of thin sheet metal. It is filled with HC smoke mixture topped with a starter mixture directly under the fuze opening. The duration of smoke screen or signal is 105 to 150 seconds. Grenade is fuzed with the M201A1 pyrotechnic delay-igniting fuze.

d. Grenade, Hand, Smoke, WP, M15 (G935). Bursting type grenade used for signaling, screening and incendiary purposes. The grenade body is of sheet steel and cylindrical in shape. The body has a fuze well liner and is filled with 15 ounces of WP. The grenades are assembled with the M206A1 or M206A2 pyrotechnic delay-detonating fuze. The screening effect of the smoke is limited because WP burns with such intense heat, the smoke tends to rise rapidly. Pieces of WP will burn for about 60 seconds, igniting any flammable substance contacted.

e. Grenade, Hand-Rifle, Smoke, WP, M34 (G937). Bursting type grenade used for signaling, screening, and incendiary purposes. It may be thrown by hand or launched from a rifle, using the M1A1 or M1A2 grenade projection adapter. The grenade body is of serrated steel and is cylindrical in shape. The body has a fuze well liner and is filled with WP. The M34 hand-rifle grenade has a safety pin, which must be removed, and a safety lever, which is released to cause the grenade to function. Newer models also contain a safety clip to keep the safety lever in place should the safety pin be unintentionally removed from the grenade. The M34 hand-rifle grenade uses the M206A2 fuze.

f. Grenade, Hand, Smoke, M18 (G940/G945/ G950/G955). These grenades are used for ground-to-air or ground-to-ground signaling and are a burning type munition. The grenades may be filled with any one of four smoke colors: red, green, yellow or violet. Each grenade will emit smoke for 50-90 seconds. The grenade body is of thin sheet metal and is filled with 11½ ounces of red, green, yellow or violet smoke composition. Grenades are assembled with the M201A1 pyrotechnic delay-igniting fuze. Older versions may have fuze model E7R6 assembled to them. This model is experimental version of the M201A1 fuze.

g. Grenade, Hand, Smoke, Colored, M48 (G932). The M48 grenade is a special-purpose, burning-type munition used as the training aid for the M47 grenade. This grenade is a nonlethal-type munition that contains red smoke mixture. The grenade consists of rubber body assembly, an M227E1 fuze, and a filling of RS red smoke mixture. The grenade weighs 390 grams (approximately 1 lb), and is 3½ inches in diameter. The gray grenade body is made of two rubber hemispheres vulcanized together. The top half of the grenade contains the fuze, and the bottom half contains the filling hole and the exhaust port. The grenade is filled with approximately 165 grams of RS mixture.

h. Grenade, Hand, Smoke, TA, M83 (G982). This is a burning type grenade used to generate smoke for screening activities of small units. The grenade body is a cylinder of thin sheet metal. It is filled with TA smoke mixture. The grenade is fuzed with the M201A1 pyrotechnic delay-igniting fuze.

i. Grenade, Hand, Incendiary, TH3, AN-M14 (G900). The TH3 incendiary hand grenade is used primarily to provide a source for intense heat to destroy equipment. It generates heat to 4000 degrees Fahrenheit. The grenade filler burn time shall not be greater than 44 seconds, but not less than 15 seconds. The grenade body is of thin sheet metal and is cylindrical in shape. It is filled with an incendiary mixture, Thermite TH3 and First Fire Mixture VII. Grenade is assembled with the M201A1 pyrotechnic delay-igniting fuze. Older models may contain fuze E7R6.

j. Grenade, Hand, Smoke, Visual, Restricted Terrain, M106 (GG25). Bursting type grenade used to produce instant, short duration white colored obscuration for screening activities inside restrictive terrain (i.e. enclosed spaces). The body is a mylar coated fiberboard cylinder with linked aluminum end caps. The grenades payload is titanium dioxide powder. The grenade is fuzed with the M201A1 Mod 3 pyrotechnic delay-igniting fuze with the confidence clip.

k. Fuze, Hand Grenade, M201A1 (G874). This is a pyrotechnic delay-igniting fuze. The body contains a primer, ignition powder, pyrotechnic delay column, and ignition mixture. Assembled to the body are a striker, striker spring, safety lever and safety pin with pull ring. The split end of the safety pin has an angular spread. The M201A1 Mod 3 is equipped with the confidence clip, which retains the pull ring from being inadvertently removed.

l. Fuze, Hand Grenade, M206A1 and M206A2 (G872). These are pyrotechnic delay-detonating fuzes. They differ only in body construction. The body contains a primer and a pyrotechnic delay column. Assembled to the body are a striker, striker spring, safety lever, safety pin with pull ring, and a detonator assembly. The split end of the safety pin has an

angular spread or a diamond crimp.

m. Fuze, Hand Grenade, M227 (G869). This is a pyrotechnic delay-igniting fuze. The body contains a primer, first-fire mixture, pyrotechnic delay column, and ignition mixture. Grenade fuze is restrained from functioning by the safety cotter pin, sliding safety latch, and handle. When the safety cotter pin is removed and the safety latch is pushed rearward from the lock pin, the handle is unlocked and grenade is armed. Releasing the handle causes the arming pin spring to eject the arming pin. This releases the firing pin, allowing the firing pin to activate the primer. The primer ignites the first fire mixture, which flashes and ignites the delay mixture. This in turn, ignites the ignition mixture. The ignition mixture burns through an aluminum foil shield on the bottom of the fuze and ignites the pyrotechnic mixture in the grenade body.

P-2. Unique Safety Precautions.

a. WP smoke is poisonous upon prolonged or repeated inhalation, particularly in confined space. Normal concentrations in open air are not likely to be harmful. Have container of water close at hand for submerging items in case of WP leakage.

b. PTA (Terephthalic Acid) may cause eye irritation and mild skin irritation. When finely divided and suspended in air, material should be considered a combustible dust.

c. HC reacts with water that can start it burning. Do not apply water as a spray or mist to burning HC items. Water can be used to fight a fire involving HC munitions if a large amount of water relative to the item is available.

d. In high concentrations or on prolonged exposures, HC smoke irritates the nose and throat and may be quite dangerous when inhaled. Personnel exposed to any concentration of HC smoke shall wear an air purifying respirator with the proper filter.

e. The pin of the M201A1 fuze used on AN-M8 HC; AN-M14 Incendiary; M83 TA Smoke, and M18 smoke grenades can be inadvertently pulled during processing. When the grenade is in its container, there is no possibility of the pin being inadvertently pulled.

f. To preclude fuze pins from being inadvertently pulled, users are cautioned to comply with the following procedures:

(1) Retain the grenades in their inner container until they are to be used or inspected.

(2) Always store and transport the grenades in the inner container.

(3) Prior to removing the grenade from the inner container, observe the fuze safety pin. If it is missing, do not remove the grenade from the inner container. If both legs of the pin are straight or if one leg is straight and the other is bent to an angle less than 45 degrees, bend each leg 90 degrees in opposite directions.

g. Grenades should never be lifted or handled by the safety pin pull ring.

h. The confidence clip has been added or will be added to a number of grenades in an effort to prevent the taping of grenades. Removal of the pull ring from the confidence clip can damage/distort the head of the safety pin and should not be reengaged.

P-3. Testing and Equipment Requirements.

None applicable.

P-4. Inspection Category and Sampling Plan.

a. Inspection Categories:

(1) Category X (4 years) - TA, Riot Control.

(2) Category Z (2 years) Colored Smoke, HC, Incendiary.

b. Sampling plan for inspection is IAW Chapter 2.

c. Inspection criteria for fuzes are contained in Appendix S.

d. Item will be inspected and classified according to Chapter 2 and Table P-1.

P-5. Inspection Description and Notes.

a. Shake manually. If rattling sound is heard (M18 grenades with slurry starter mix only), smoke grenade is to be considered serviceable, with restrictions (B01), (C06), and defect classified as major. Engineering changes for M18 smoke grenades provided for the use of starter mix slug in lieu of starter mix in slurry form. As a result, when grenade with slug starter mix is checked for looseness (manually shaken) there is a slight rattle. This is not a defect, but is inherent in the M18 design. Starter mix slug was introduced into Pine Bluff Arsenal lots as follows:

(1) 1330-G940 (Green) PB-89B013..... and after.

(2) 1330-G945 (Yellow) PB-89A033.....and after.

(3) 1330-G950 (Red) PB-88H055.....and after.

(4) 1330-G955 (Violet) PB-88M072.....and after.

b. Feel where tape is covering emission hole to ensure there has actually been a hole made in the metal container underneath the tape.

c. If the grenade is upside down in the inner container (fuze not visible), or if any of the above discrepancies are noted, it should remain inside the container and action taken to dispose of it safely.

d. Do not reinsert the pull ring into the confidence clip. Reclassify grenade to CC-F for refuzing – defect code FZ151 applies. A grenade with the pull ring disengaged from the confidence clip should not be considered unsafe unless evidence of damage to the safety pin is present to the extent that it endangers the user. This defect criteria does not apply to grenades manufactured without a confidence clip.

P-6. References.

a. TM 9-1300-200.

b. TM 9-1330-200-12.

c. TM 9-1330-200-34.

d. TM 43-0001-29.

e. FM 3-23.30.

Table P-1. Item Defects and Method of Inspection

Classification	Application	Inspection Method	Inspection Description
1. Critical:			
a. Unauthorized fuze installed.	All	Visual	
b. Safety pin missing, or insecurely assembled to the extent that it endangers the user.	All	Visual	
c. Grenades mixed within lot which can result in hazardous or unsafe conditions for persons using or maintaining items.	All	Visual	
d. Marking misleading as to color of smoke.	M18	Manual	
e. Evidence of leakage.	M15, M34	Visual	
f. Grenade packed upside down.	M15, M34	Visual	
g. Emission holes missing.	AN-M8, AN-M14, M48	Visual/Manual	Para P-5b
2. Major:			
a. Split seams or swollen body.	All	Visual	
b. Tape missing, loose, or does not completely cover emission hole.	All	Visual	
c. Fuze loose; not in full 360 degree contact with gasket.	All	Visual	
d. Grenade contents leaking.	AN-M8, M18, M106	Visual	
e. Marking incorrect.	All	Visual	
f. Rust or corrosion to the extent that grenade cannot be used as intended.	All	Visual	
g. Grenade cannot be removed from container.	All	Visual	
h. Safety latch missing.	M48	Visual	
i. Grenade packed upside down.	AN-M8, M14, M18, M48, M106	Visual	Para P-5c
j. Pull ring not inserted into confidence clip.	As applicable	Visual	Para P-5d
k. Grenade slurry mixture loose.	M18	Visual/Manual	Para P-5a
3. Minor:			
a. Marking incomplete or illegible but type of grenade and lot number are identifiable.	All	Visual	
b. Minor rust/corrosion.	All	Visual	
c. Layers of flaked rust which, when removed, leave pitting that will not affect functioning.	All	Visual	
d. Inadequate paint coverage.	All	Visual	

APPENDIX Q
RIOT CONTROL GRENADES

Q-1. Item Description.

a. FSC: 1330.

b. Ammunition Type: Grenade, Hand, Riot, CN, M7, M7A1; CS, M7A3; CS, M47; CN1, ABC-M25A1; CS1, ABC-M25A2; and CS, M58.

c. Riot control grenades are used to control insurgencies and for other tactical missions. They may also be used to simulate casualty agents during training.

d. Grenade, Hand, CN, M7 and M7A1 (G960):

(1) These grenades are burning type riot control agent grenades. CN has a powerful lachrymal effect and is irritating to the upper respiratory passages. In higher concentrations it is irritating to the skin, causing a burning and itching sensation. Incapacitation occurs at 15 to 30 seconds after exposure and endures for 5 to 20 minutes depending upon dosage concentration.

(2) The grenade bodies are of thin sheet metal and are cylindrical in shape. The filling is compressed into the grenade body, a tapered hole being formed through the body of the filling. The top surface of the filling and the tapered walls of the hole are coated with starter mixture (to aid ignition of the fuel by the fuze). Grenades are assembled with the M201A1 pyrotechnic delay-igniting fuze.

e. Grenade, Hand, CS, M7A3 (G963):

(1) The M7A3 grenade is a CS filled, burning type grenade. CS has a powerful lachrymal effect and is irritating to the upper respiratory passages causing coughing, difficulty in breathing and chest tightness. Heavy concentrations will cause nausea and vomiting as well. Incapacitation occurs 15 to 30 seconds after exposure and endures less than 10 minutes after personnel are removed to fresh air.

(2) The grenade body is a cylinder made of thin sheet metal. The filler is compressed into the grenade body with a starter mix. Grenades are assembled with the M201A1 pyrotechnic delay-igniting fuze.

f. Grenade, Hand, CS, M47 (G922). The M47 is a burning type grenade. It consists of a rubber body assembly, an M227 fuze, and a filling of CS pyrotechnic mixture. The grenade weighs 410 grams (approximately 1 lb), and is 3½ inches in diameter. The gray grenade body is made of two rubber hemispheres vulcanized together. The top half of the grenade contains the fuze, and the bottom half contains the filling hole and the exhaust port. The grenade is filled with approximately 185 grams of CS pyrotechnic granulated mix.

g. Grenade, Hand, CN1, ABC-M25A1 (G927). This is a bursting type grenade. The grenade body is spherical. It is made of two plastic hemispheres cemented together. The two pieces together form a burster well and slider housing. It is assembled with a pyrotechnic delay-detonating type integral fuze. The fuzing components consist of an arming sleeve, arming pin, firing spring, slider assembly and firing pin. The slider assembly contains a primer, pyrotechnic delay column and a detonator. The grenade is assembled with a safety pin and pull ring. Safety clips are not required with these grenades.

h. Grenade, Hand, CS1, ABC-M25A2 (G924). This is a bursting type grenade.

(1) CS1 has a powerful lachrymal effect and is irritating to the upper respiratory passages, causing coughing, difficulty in breathing and chest tightness. Heavy concentrations will cause nausea and vomiting as well. Incapacitation occurs 15 to 30 seconds after exposure and endures from 30 minutes to several hours depending upon the dosage concentration. CS is more persistent and has a more severe reaction than CN.

(2) The grenade body is spherical. It is made of two plastic hemispheres cemented together. The two pieces together form a burster well and a slider housing.

(3) The fuze is an integral pyrotechnic delay-detonating type. The fuzing components consist of an arming sleeve, arming pin, firing spring slider assembly and firing pin. The slider assembly contains a primer, pyrotechnic delay column, and a detonator. The grenade is assembled with a safety pin and pull ring. Safety clips are not required with these grenades.

i. Pocket CS Grenade, M58 (G933). This is a burning type riot control agent grenade. The body is a thin walled, two piece aluminum cylinder. It contains a CS pyrotechnic composition. There is a hole in the base of the body which is used for agent emission after functioning. The grenade is fuzed with the M201A1E1 fuze which is similar to the M201A1.

j. Fuze, Hand Grenade, M201A1 (G874). This is a pyrotechnic delay igniting fuze. The body contains a primer, first fire mixture, pyrotechnic delay column, and ignition mixture. Assembled to the body are a striker, striker spring, safety lever and safety pin with pull ring. The split end of the safety pin has an angular spread.

k. Fuze, Hand Grenade, M227 (G869). This is a pyrotechnic delay igniting fuze. The body contains a primer, first fire mixture, pyrotechnic delay column, and ignition mixture. Grenade fuze is restrained from functioning by the safety cotter pin, sliding safety latch, and handle. When the safety cotter pin is removed and the safety latch is pushed rearward from the lock pin, the handle is unlocked and grenade is armed. Releasing the handle causes the arming pin spring to eject the arming pin. This releases the firing pin, allowing the firing pin to activate the primer. The primer ignites the first fire mixture, which flashes and ignites the delay mixture. This in turn, ignites the ignition mixture. The ignition mixture burns through an aluminum foil shield on the bottom of the fuze and ignites the pyrotechnic mixture in the grenade body.

Q-2. Unique Safety Precautions.

a. Grenades should never be lifted or handled by the safety pin pull ring.

b. Before any grenade is removed from its fiber container, it must be thoroughly inspected to see that the safety pin is in place, undamaged, and prongs of the safety pin are spread approximately 45 degrees or

diamond crimped. This inspection must also ensure that the fuze lugs are not cracked or broken and the safety lever ears are properly assembled under the lugs.

c. If the grenade is upside down in the fiber container (fuze not visible), or if any of the above discrepancies are noted, it should remain inside the container and action taken to dispose of it safely.

d. Any riot control agent may present an inhalation and irritant hazard. Prolonged exposure of the eyes and respiratory system should be avoided. Wear protective masks to avoid excessive exposure when loose or airborne riot control agent is present.

Q-3. Testing and Equipment Requirements.

Not applicable.

Q-4. Inspection Category and Sampling Plan.

a. Inspection Category X; Periodic Inspection Interval - four years.

b. Sampling plan for inspection is IAW Chapter 2.

c. Inspection criteria for fuzes are contained in Appendix S.

d. Item will be inspected and classified IAW Chapter 2 and Table Q-1.

Q-5. References.

a. FM 23-30.

b. TM 9-1300-200.

c. TM 9-1330-200-12.

d. TM 9-1330-200-34.

e. TM 43-0001-29.

Table Q-1. Item Defects and Method of Inspection.

Classification	Application	Inspection Method	Inspection Description
1. Critical:			
a. Safety pin missing.	All	Visual	
b. Safety pin is insecurely assembled to an extent that it endangers the user.	All	Visual	
c. Incorrect fuze model assembled to grenade.	All	Visual	
d. Grenades mixed within lot which can result in hazardous or unsafe conditions for persons using or maintaining items.	All	Visual	
e. Marking misleading as to type of grenade.			
2. Major:			
a. Tape loose or does not completely cover emission holes.	All	Visual	
b. Grenades show signs of filler leakage.	All	Visual	
c. Grenade packed upside down in fiber or metal container.	All	Visual	
d. Rust or corrosion to the extent items cannot be used as intended.	All	Visual	
e. Grenades loose in containers to the extent items cannot be adequately protected during transit.	All	Visual	
f. Lot number missing or illegible.	All	Visual	
g. Grenade cannot be removed from container.	All	Visual	
h. Grenade body seams split.	M7A3	Visual	
i. Grenade body swollen.	M7A3	Visual	
j. Missing or loose filler plug.	M25A2	Visual	
k. Safety latch missing.	M47	Visual	
3. Minor:			
a. Marking missing or illegible.	All	Visual	
b. Minor rust/corrosion.	All	Visual	
c. Layers of flaked rust which, when removed, leave pitting that will not affect functioning.	All	Visual	
d. Inadequate paint coverage.	All	Visual	

APPENDIX R
FRAGMENTATION GRENADES

R-1. Item Description.

a. FSC: 1330.

b. Ammunition Type: Grenade, Hand, Fragmentation, Delay M26, M26A1, M33, M61, M67.

c. Fragmentation hand grenades are used to supplement small arms fire against the enemy in close combat. The grenade produces casualties by high velocity projection of fragments.

d. Delay grenades, M26, M26A1, and M61 (G890/G880). Bodies are constructed of two pieces of thin wall sheet steel and have a notched fragmentation coil liner. Bodies are filled with Composition B. Each grenade is assembled with M204A1 or M204A2 pyrotechnic delay detonating fuze. Difference between M26, M26A1 and M61 is that the M61 has a safety clip. Safety clip is designed to keep the safety lever in place should the safety pin be unintentionally removed from the grenade. It is an additional safety device used in conjunction with the safety pin. The safety clip, of spring steel wire, consists of a loop which fits around the fuze body and a clamp which fits over the safety lever.

e. Delay grenades, M33 and M67 (G888/G881). The grenade body is a 2.5 inch steel sphere which is designed to burst into numerous fragments when detonated. The grenade body contains 6.5 ounces of high explosive, Composition B. Each grenade is fitted with an M213 pyrotechnic delay detonating fuze. Difference between M33 and M67 is the M67 grenade has a safety clip.

f. Fuze, M204A1 and M204A2 (G873). These are pyrotechnic delay-detonating fuzes. They differ only in body construction. The body contains a primer and a pyrotechnic delay column. Assembled to the body are a striker, striker spring, safety lever, safety pin with pull ring, and a detonator assembly. The split end of the safety pin has an angular spread or diamond crimp.

g. Fuze, pyrotechnic delay detonating, M213 (G877).

(1) The body of the fuze contains a primer and a pyrotechnic delay column. Assembled to the body are a striker, striker spring, safety lever, safety pin and pull ring, safety clip, and a detonator assembly.

(2) The M213 fuze is equipped with a steel safety pin and pull ring. The split end of the safety pin is either spread approximately 40 degrees or diamond shaped to prevent accidental removal and arming during shipping and handling. The pull ring is provided to facilitate easy removal of the safety pin.

(3) A second safety feature is the steel safety clip. The safety clip's purpose is to prevent the safety lever from snapping upward into a triggered position, in the event the safety pin is accidentally dislodged from the fuze.

R-2. Unique Safety Precautions.

a. Grenades should never be lifted or handled by the safety clip or the safety pin pull ring.

b. Before any grenade is removed from its fiber container, it must be thoroughly inspected to see that the safety pin is in place and undamaged and that the prongs of the safety pin are spread approximately 45 degrees or diamond crimped. This inspection must also ensure that the fuze lugs are not cracked or broken and the safety lever ears are properly assembled under the lugs.

c. If the grenade is upside down in the fiber container (fuze is not visible), or if any of the above discrepancies are noted, it should remain inside the container and action taken to dispose of it safely.

d. The confidence clip has been added or will be added to a number of grenades in an effort to prevent the taping of grenades. Removal of the pull ring from the confidence clip can damage/distort the head of the safety pin and should not be reengaged.

R-3. Testing and Equipment Requirements.

a. Test of fuze assembly torque will be according to the applicable portions of Table R-2 and paragraph R-5b. Testing will be accomplished once during the life cycle of the item. This test will be conducted during IRI. If equipment is not available, it will be ordered and testing will be conducted during the next cyclic inspection. Torques testing results from another installation is acceptable.

b. The required test equipment is listed in Table R-1.

Table R-1 Equipment Identification List

Description	Stock Number
Fuze adapter, hand grenade	4925-01-033-4451
Torque wrench, dial indicator, 50 inch pound capacity direct reading with memory indicator	As applicable
Scribe, metal	As applicable
Pitch-in Barricade, Hand Grenade, Delay Type	APE 1213M1

R-4. Inspection Category and Sampling Plan.

a. Inspection Category Y, Periodic Inspection interval - three years.

b. Sampling plan for inspection is IAW Chapter 2.

c. Inspection criteria for fuzes are contained in Appendix S.

d. Items will be inspected and classified according to Chapter 2 and Table R-2.

R-5. Inspection Description and Notes.

a. Visually inspect the neck area for cracks. Cracks (usually in the seam area) that extend downward from the upper edge of the neck to the body and are completely through the metal preclude proper torque being applied to the fuze. These will be classified as major defects.

b. Perform a test of fuze assembly torque according to the following procedures:

(1) Equipment required is listed in Table R-1.

(2) Scribe a line across junction of fuze and grenade body to provide means of detecting movement

between components. Apply 26 inch-pound torque in tightening direction (clockwise).

(3) Any movement of fuze at torque values of less than 26 inch-pounds will be classified as a major defect. Otherwise serviceable lots rejected as a result of torque failure will be assigned condition code E and reported by memorandum to the office in para 1-5.d.(1). Report will include specific torque values obtained.

(4) Actual performance of test requires caution by operator when applying torque to fuze body. Also avoid physically contacting fuze lever while torquing, as inaccurate values will result.

c. Do not reinsert the pull ring into the confidence clip. Reclassify grenade to CC-F for refuzing – defect code FZ151 applies. A grenade with the pull ring disengaged from the confidence clip should not be considered unsafe unless evidence of damage to the safety pin is present to the extent that it endangers the user. This defect criteria does not apply to grenades manufactured without a confidence clip.

R-6. References.

a. TM 9-1300-200.

b. TM 9-1330-200-12.

c. TM 9-1330-200-34.

d. TM 43-0001-29.

e. FM 3-23.30.

Table R-2. Item Defects and Method of Inspection

Classification	Application	Inspection Method	Inspection Description
1. Critical:			
a. Safety pin missing or broken.	All	Visual	
b. Safety pin is insecurely assembled to an extent that it endangers the user.	All	Visual	
c. Incorrect model fuze assembled to grenade.	All	Visual	
d. Grenade packed upside down in fiber or metal container.	All	Visual	
e. Safety clip (where applicable) missing or improperly positioned.	All	Visual	
f. Either or both lever hinge ears missing.	All	Visual	Fig. S-1
g. Both lever hinge ears not bent away from the body past the vertical center line of the body hinge bosses.	All	Visual	Fig. S-1
h. Ends of both lever hinge ears not bent upwards.	All	Visual	Fig. S-1
i. Grenades mixed within the lot which can result in hazardous or unsafe conditions for persons using or maintaining items.	All	Visual	
j. Marking misleading as to grenade type.	All	Visual	
2. Major:			
a. Cracks in neck area of grenade.	All	Visual	Para R-5a
b. Lot number missing or illegible.	All	Visual	
c. Pull ring is missing but safety pin is securely assembled.	All	Visual	
d. Pull ring is damaged to the extent that the safety pin cannot be easily extracted.	All	Visual	
e. Rust or corrosion to the extent that the grenade cannot be used as intended.	All	Visual	
f. Any movement of fuze at torque values of less than 26 inch-pounds.	All	Visual/Manual	Para R-5b
g. Grenade loose in containers to the extent items cannot be adequately protected in transit.	All	Visual	
h. Either lever hinge ear not bent away from the body past the vertical center line of the body hinge boss.	All	Visual	Fig. S-1
i. End of either lever hinge ear not bent upwards.	All	Visual	Fig. S-1
j. Improperly assembled, seated, or loose fuze.	All	Visual	
k. Pull ring not inserted into confidence clip.	As applicable	Visual	Para R-5c
3. Minor:			
a. Paint defects (i.e., scale, peeling, blistering, etc.).	All	Visual	
b. Layers of flaked rust which leaves pitting when removed but does not affect functioning.	All	Visual/Manual	
c. Marking of grenade incomplete or illegible but type of grenade and lot number are identifiable.	All	Visual	
d. Inadequate paint coverage.	All	Visual	
e. Missing gasket between fuze and neck of grenade.	All	Visual	

APPENDIX S
HAND GRENADE FUZES

S-1. Item Description.

a. FSC: 1330.

b. Ammunition Type: Fuze, Hand Grenade, M201A1; M204 Series; M213; Fuze, Hand Grenade, Offensive, M206; Fuze, Hand Grenade, Practice M205 and M228.

c. Fuze, Hand Grenade M201A1 (G874). This is a pyrotechnic delay-igniting fuze. The body contains a primer, first-fire mixture, pyrotechnic delay column, and ignition mixture. Assembled to the body are a striker, striker spring, safety lever and safety pin with pull ring. The split end of the safety pin has an angular spread.

d. Fuzes, Hand Grenade M204A1 and M204A2 (G873):

(1) These are pyrotechnic delay-detonating fuzes. They differ only in body construction.

(2) The body contains a primer and a pyrotechnic delay column. Assembled to the body are a striker, striker spring, safety lever, safety pin with pull ring, and a detonator assembly. The split end of the safety pin has an angular spread or diamond crimp.

(3) The hand grenade safety clip (when applicable) is designed to keep the safety lever in place should the safety pin be unintentionally removed from the grenade. It is an additional safety device used in conjunction with the safety pin. The safety clip, of spring steel wire, consists of a loop that fits around the fuze body and a clamp that fits over the safety lever.

e. Fuzes, Hand Grenade M206A1 and M206A2 (G872):

(1) These are pyrotechnic delay-detonating fuzes. They differ only in body construction.

(2) The body contains a primer and a pyrotechnic delay column. Assembled to the body are a striker, striker spring, safety lever, safety pin with pull ring and a detonator assembly. The split end of the safety pin has an angular spread or a diamond crimp.

(3) When applicable, the hand grenade safety clip is designed to keep the safety lever in place should the safety pin be unintentionally removed from the grenade. It is an additional safety device used in conjunction with the safety pin.

(4) Safety clips, of spring steel wire, consist of a loop, which fits around the threaded section of the fuze, and a clamp, which fits over the safety lever. Because the loop fits around the threaded section of the fuze, the clip must be assembled to the grenade when the fuze is assembled to the grenade.

f. Fuze, Hand Grenade M213 (G877):

(1) This is a pyrotechnic delay-detonating fuze.

(2) The body of the fuze contains a primer and a pyrotechnic delay column. Assembled to the body are a striker, striker spring, safety lever, safety pin and pull ring, safety clip, and a detonator assembly.

(3) The M213 fuze is equipped with a steel safety pin and pull ring. The split end of the safety pin is either spread approximately 40 degrees or diamond-shaped to prevent accidental removal and arming during shipping and handling. The pull ring is provided to facilitate easy removal of the safety pin. A second safety feature is the steel safety clip. The safety clip's purpose is to prevent the safety lever from snapping upward into a triggered position, in the event the safety pin is accidentally dislodged from the fuze.

(4) M213 fuzes must be hard-plate x-rayed prior to assembly into an M67 grenade. Fuzes are delivered to LAP or renovation facility from manufacturer without being x-rayed under NSN 1330-00-182-3570. Fuzes with this NSN are not considered unserviceable and will be retained in the condition code that a government representative accepted them in. When fuzes are x-rayed, the NSN is changed to 1330-00-182-3590. Fuzes with this NSN must have a statement on the Ammunition Data Card that they were 100% x-rayed. Notify JMC Ammunition office if fuzes do not have the statement.

g. Fuze, Hand Grenade, Practice, M205 Series (G870):

(1) The M205A1 and M205A2 are pyrotechnic delay igniting fuzes. They differ in body construction only. The body contains a primer and a pyrotechnic delay column. Assembled to the body are a striker, striker spring, safety lever, safety pin with pull ring, and an igniter assembly. The split end of the safety pin has an angular spread or a diamond crimp.

(2) The hand grenade safety clip (when applicable) is designed to keep the safety lever in place should the safety pin be unintentionally removed from the grenade. It is an additional safety device used in conjunction with the safety pin. The hand grenade safety clip, of spring steel wire, is shaped in a special configuration for installation on the grenade. It consists of a clamp that fits around the fuze body and over the safety lever. It serves to prevent release of the grenade safety lever if the safety pin is accidentally released.

h. Fuze, Hand Grenade, Practice, M228 (G878):

(1) Practice fuze M228 is a pyrotechnic delay igniting fuze. The body contains a primer and pyrotechnic delay column. Assembled to the body are a striker, striker spring, safety lever, safety pin with pull ring, safety clip (older models do not have the safety clip), and igniter assembly. The split end of the safety pin has an angular spread or a diamond crimp.

(2) The hand grenade safety clip is designed to keep the safety lever in place should the safety pin be unintentionally removed from the grenade. It is an additional safety device used in conjunction with the safety pin. The safety clip is assembled to the fuze. (Older models have the safety clip assembled to the grenade and positioned around the safety lever).

S-2. Unique Safety Precautions.

a. Fuzes should never be lifted or handled by the safety clip or the safety pull ring.

b. Before any fuze is removed from its fiber container, it must be thoroughly inspected to see that the safety pin is in place and undamaged and that the prongs of the safety pin are spread approximately 45 degrees or diamond crimped. This inspection must also ensure that the fuze lugs are not cracked or broken and the safety lever ears are properly assembled under the lugs.

S-3. Testing and Equipment Requirements.

Not applicable.

S-4. Inspection Category and Sampling Plan.

a. Inspection Category Y; Periodic inspection interval - three years.

b. Sampling plan for inspection is IAW Chapter 2.

c. Items will be inspected and classified according to Chapter 2 and Table S-1.

Table S-1. Item Defects and Method of Inspection.

Classification	Application	Inspection Method	Inspection Description
1. Critical:			
a. Safety pin missing or broken.	All	Visual	
b. Safety clip missing (where applicable).	All	Visual	
c. Safety pin insecurely assembled to the extent that user is endangered.	All	Visual	
d. Igniter case cracked to extent that pyrotechnic charge is exposed, free to escape, or may be pinched between broken surfaces.	M205, M228	Visual	
e. Detonator case cracked to extent that explosive charge is exposed, free to escape, or may be pinched between broken surfaces.	M204, M206, M213	Visual	
f. Both fuze lever hinge ears not properly assembled.	All	Visual	Fig S-1
g. Either or both hinge ears missing or broken.	M204, M206, M213	Visual	Fig S-1
5. Major:			
a. Any of the following missing or damaged to extent that precludes proper functioning: (1) Pull ring. (2) Fuze threads. (3) Any other item that precludes use of fuze in a hand grenade.	All	Visual	
b. Fuze marking incomplete, inaccurate, or illegible to extent it is misleading as to type of fuze.	All	Visual	
c. One fuze lever hinge ear not properly assembled.	All	Visual	Fig S-1
d. Aluminum foil ignition seal damaged or punctured.	M201A1	Visual	
e. Rust or corrosion to the extent that fuze cannot be used as intended.	All	Visual	
6. Minor:			
a. Marking incomplete or illegible but type of fuze and lot number are identifiable.	All	Visual	
b. Minor rust/corrosion.	All	Visual	

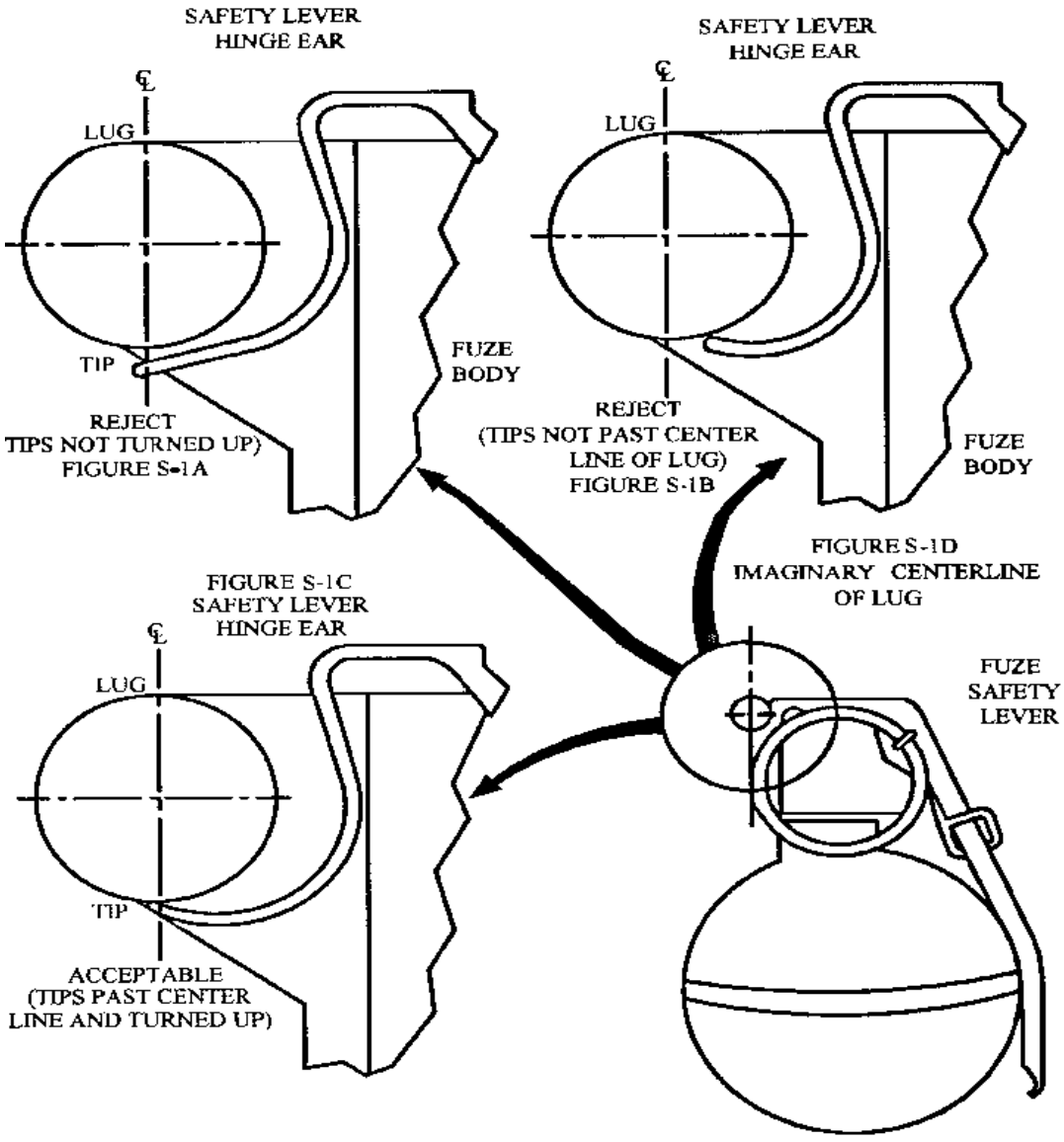


FIGURE S-1. SAFETY LEVER HINGE

APPENDIX T
ROCKET, 3.5 INCH

T-1. Item Description.

a. FSC: 1340.

b. Ammunition type: Rocket, 3.5-inch. Includes the following models: M28A2 (HEAT), M29A2 (practice), and M30 (WP).

c. The 3.5 inch is a fixed fin stabilized rocket, consisting of three major components: warhead, fuze, and motor. For a complete description of these rockets see TM 43-0001-30 and the drawings for the particular round. All 3.5 inch rockets with propellant or igniters over 10 years old require replacement of propellant and igniters. Replacement propellant must have a current load authorization. Replacement igniters must have been reassessed according to paragraph T-7 within 2 years from tentative date of replacement.

T-2. Unique Safety Precautions.

a. An RF energy survey should be performed prior to moving lots of 3.5 inch rockets known to have (or suspected of having) missing or ineffective shorting clips.

b. The maximum electromagnetic radiation (EMR) the 3.5 inch rocket may safely be exposed to in its storage and shipping configuration with a missing or ineffective clip is 20 volts per meter. In a truck or shipping container totally enclosed in metal, the 3.5 inch rocket can safely withstand EMR at levels 10 times (200 V/m) greater than in its storage configuration.

c. Following information pertains to movements where criteria of paragraph T-2b cannot be assured.

(1) Fiber containers, wooden boxes, or cardboard boxes do not provide adequate EMR protection. Seal rockets or container in MIL-B-131 foil barrier bag.

(2) Metal containers do provide adequate shielding for shipment of 3.5 inch Rockets provided containers have not been opened.

(3) Metal containers that have been opened must be resealed by either of the following methods:

(a) Seal with copper or aluminum foil tape. The electrical conductivity of the entire container is critical to EMR protection. To assure conductivity, remove all paint and tar from the tube in the vicinity of the opening. Securely seal the opening with copper or aluminum foil tape, attaching tape to shiny, bare metal.

(b) Seal rocket in MIL-B-131 foil barrier bag and repack into outer pack.

(4) Additional precautions to be taken during handling:

(a) Turn off radio frequency (RF) transmitters.

(b) Avoid exposure to RF fields such as the main beam of RADAR transmitters.

(c) Questions regarding EMR field levels should be cleared with safety office.

(5) No historical records exist to indicate that all rocket motor shunts are ineffective. The only way to ascertain whether a shunt is effective is by testing.

T-3. Testing and Equipment Requirements.

Test and measurement equipment and requirements are listed in Table T-1. Specific tests listed in Table T-1 are supplemental to the general inspection criteria of Chapter 2 and the specific inspection criteria of Table T-2. Inspection must not be limited to these tests.

T-4. Inspection Category and Sampling Plan.

a. Inspection category X, periodic inspection interval - 4 years.

b. The sampling plan for inspection is according to Chapter 2.

T-5. Specific Inspection Points.

Item will be inspected and classified according to Chapter 2 and Table T-2.

T-6. Inspection Description and Notes.

a. Test with shorting clip in place must not exceed 0.055 ohms. The test will be performed without disturbing the shorting clip when removed from the container.

b. If the ejection pin is missing, the rocket will be considered armed and treated accordingly.

c. Any round with a discernible 360 degree gap between the fuze and the warhead is to be rejected.

d. Grasp the fuze with one hand and twist the rocket head with the other. Repeat holding the fuze with one hand and twisting the motor body with the other hand. Any movement rejects the rocket.

e. Test will be conducted from the copper contact band (live lead) or blue auxiliary lead to the unpainted groove in the support ring (ground contact).

f. Test the ejection pin for freedom of movement. This is done on the M404A1 fuze (square ejection pin) by merely depressing the pin with the fingers and releasing it. It is done on the M404A2 fuze (round ejection pin) by depressing the pin with the fingers and then twisting it and releasing. If the ejection pin binds while being depressed or twisted, reject the rocket.

g. When the contact ring is damaged or improperly assembled, so that its functional effectiveness has been destroyed, it will be classified as a defect.

h. Lots already in an unserviceable condition code for replacement of propellant or igniters or requiring 100 percent test of igniter circuit or shorting clip do not require electrical test.

i. Gaging is not normally required during RI, PI, or UBLI. Gaging during these inspections should be limited to individual rounds having visual evidence of damage or other conditions which may preclude loading and firing. Unless such rounds requiring gaging are truly representative of the lot being inspected, they should be disregarded in evaluating the lot.

j. Only igniter circuit testers meeting the specifications of MIL-T-11393 are authorized. Testers supplied under NSN 4925-00-712-0205 meet these requirements. Authorized testers include, but are not limited to, the Alinco No. 101-5BF, 101-5BFG, and the Simpson No. 4-000ITS.

T-7. Reassessment of Rocket Motor Igniter M20A1.

a. Nonfunctional inspection criteria are given in Table T-3. The sample size is fifty igniters.

b. Functional criteria. Lots passing the nonfunctional test will have 50 samples functionally tested. These samples must be non-functionally acceptable. The igniter will be initiated using the firing mechanism from a 3.5-inch rocket launcher. A failure to ignite is a major defect, accept on one, reject on two.

Table T-1. Equipment Identification and Test Requirements.

Description	Identification	Inspection	Application
Continuity test equipment (shielded).	5220-00-313-3092	IRI	Complete round gaging
Igniter circuit tester.	4925-00-712-0205	IRI, RI, PI	Igniter resistance test

Table T-2. Item Defects and Method of Inspection.

Classification	Application	Inspection Method	Inspection Description
1. Critical:			
a. Shorting clip missing or ineffective.	All	Visual/Test	Para T-6a
b. Exuding filler.	M28A2	Visual	
c. Leaking WP.	M30	Visual	
d. Fuze ejection pin missing.	M28A2, M30	Visual	Para T-6b
e. Gap between fuze and warhead.	M28A2, M30	Visual	Para T-6c
2. Major:			
a. Nozzle assembly loose, cracked, or distorted.	All	Visual	
b. Fuze safety band missing.	M28A2, M30	Visual	
c. Assembly loose at any joint or not fully assembled.	All	Visual/Manual	Para T-6d
d. Igniter circuit resistance below 0.675 ohms.	All	Test	Paras T-6e, T-6j
e. Ejection pin frozen.	M28A2, M30	Visual/Manual	Para T-6f
f. Igniter wires, electrical connections loose.	All	Visual/Manual	
g. Fins loose.	All	Visual/Manual	
h. Rocket not packed with head in direction indicated on pack.	All	Visual	
i. Contact ring damaged or improperly assembled.	All	Visual	Para T-6g
3. Minor:			
a. Igniter circuit resistance above 3.025 ohms.	All	Test	Paras T-6e, T-6j
b. Tag missing from shorting clip.	All	Visual	
c. Fuze safety band missing.	M29A2	Visual	
d. Ejection pin missing.	M29A2	Visual	

Table T-3. Nonfunctional Inspection Criteria for M20A1 Rocket Motor Igniter.

Defect	Classification	Accept	Reject
Powder leakage	Critical	0	1
Damaged igniter body	Major	1	2
Damaged lead wire	Major	1	2
Resistance not within 0.75 to 1.25 ohms	Major	1	2

APPENDIX U
ROCKET, 2.75 INCH

U-1. Item Description.

a. FSC: 1340.

b. Ammunition Type: Rocket, 2.75 Inch.

c. Referred to as Hydra 70 Rocket, 2.75 Inch Rocket system consists of a variety of warheads and fuzes and uses the MK40 or MK66 series rocket motor. Complete description of rockets/components can be found in TM 43-0001-30.

d. 2.75 Inch Rockets are air to ground rockets designed for deployment from rotary and fixed wing aircraft.

e. Rockets with MK40 motor are low spin, folding fin aircraft rockets (LSFFAR). Rockets with MK66 motor are spin stabilized, wrap around fin aircraft rockets (SSWAFAR).

U-2. Unique Safety Precautions.

a. Palletized (boxed and fastpack container) rockets, or rocket motors dropped five feet or more will be placed in CC-H and reported IAW DA PAM 750-8.

b. Unpalletized/unboxed/unpackaged rockets or rocket motors dropped from any distance will be placed in CC-H and reported IAW DA PAM 750-8.

c. Rocket motors are electrically initiated items and should be protected from sources of electromagnetic radiation and stray currents. Personnel will wear conductive safety shoes and will stand on conductive flooring or conductive mats when handling rocket motor. Inspection tables and test equipment will be properly grounded IAW DA PAM 385-64.

d. MK40 Mod1 and subsequent mods and MK66 all mods are considered propulsive at all times.

e. Fuze, Remote Settable, M439 has a resistance capacitance element, which is charged when attempting to fire the rocket. If fuze is set (charged) and motor fails to ignite, it may be loaded into another tube and fired. This second attempt to fire, however, will not be accurate. Though fuze remains safe, once set, fuze requires ten days to bleed charge to restore accuracy, and 45 days to completely discharge.

U-3. Testing and Equipment Requirements.

a. Test rockets IAW Table U-1.

Table U-1. Test Requirements

Model	IRI	RI	PI	BLI
MK40 Rocket Motor	A, B	B	N/A	N/A
a. Continuity Test: test is not required for 2.75 inch Hydra Rocket with MK66 Rocket Motor. b. Torque test.				

b. Table U-2 identifies test and measurement equipment.

Table U-2. Equipment Identification List

Description	NSN	Application
APE 1189	4925AA11890000	Rocket Motor/ Complete Round
APE 1189 Kits	Various	Rocket Motor/ Complete Round
Torque Fixture	4925-00-781-6511	Fuze/Warhead Interface Warhead/Motor Interface

U-4. Inspection Category And Sampling Plan.

a. Inspection category.

(1) Category X: 4 years (includes Flechette, MPSM, HE, WP, RP, Practice, and Multipurpose Penetrator warheads/rockets; MK40 and MK66 rocket motors).

(2) Category Y: 3 years (includes Flare and Illuminating warheads/rockets).

b. Sampling plan for inspection is IAW Chapter 2.

U-5. Specific Inspection Points.

Items will be inspected and classified according to Chapter 2 and Tables U-3 through U-6.

Table U-3. Complete Round

Classification	Application	Inspection Method	Inspection Description
1. Critical: None defined.			
2. Major:			
a. Loosely assembled components (i.e., fuze to warhead or warhead to motor).		Visual/Torque Test	Para U-6b
b. Gap between fuze and warhead or warhead and motor		Visual	Para U-6f
c. Incorrect orientation in outer pack (i.e., nose end of rocket not pointing in direction of nose end marking on outer pack).		Visual	
3. Minor: None defined.			
Note: See Tables U-4 through U-6 for defect criteria on individual components of complete round.			

Table U-4. Warhead			
Classification	Application	Inspection Method	Inspection Description
1. Critical:			
a. Filler exudation or leakage.		Visual	
b. Crack or dent in warhead.		Visual	
c. Gouge in warhead.		Visual/depth gage	Para U-6g(1)
d. Missing crimp in main parachute, bulkhead & igniter area.	M257, M278	Visual	
2. Major:			
a. Corrosion/rust on metal surfaces or threads extensive enough to prevent assembly and/or effect metal integrity.		Visual	
b. Damaged threads that would prevent assembly.		Visual	
c. Gouge in warhead.		Visual/Depth Gage	Para U-6g(1)
d. Blistering or peeling paint that would require complete repainting.		Visual	
e. Marking illegible/obliterated to extent that item cannot be positively identified.		Visual	
f. Plastic nose cone damaged or loose.	Flechette	Visual	
g. Damaged or bent umbilical connector..	M255A1,M261, M267	Visual	
h. Damaged umbilical cord.	M255A1, M261, M267	Visual	
i. Presence of dirt, mud or foreign material in or around the tip of the fuze/nose.	M282	Visual	
3. Minor:			
a. Light corrosion/rust that does not affect assembly or metal integrity.		Visual	
b. Markings faded, dim and/or partially illegible, but item can be identified.		Visual	
c. Paint blistering or peeling in spots.		Visual	
d. Scratches through entire protective coating.		Visual	
Note: For fuzed warhead, see Table U-5 for defect criteria on fuze.			

Table U-5. Fuze			
Classification	Application	Inspection Method	Inspection Description
1. Critical:			
a. Crack or dent in fuze body.		Visual	
b. Gouge in fuze body.		Visual/Depth Gage	Para U-6h
2. Major:			
a. Corrosion/rust on metal surfaces or threads extensive enough to prevent assembly and/or affect metal integrity.		Visual	
b. Damaged threads that would prevent assembly.		Visual	
c. Gouge in fuze body.		Visual/Depth Gage	Para U-6h
d. Marking illegible/obliterated to extent that item cannot be positively identified.		Visual	
e. Loose ogive on fuze.	M423 and M427	Visual	Para U-6a
f. Umbilical assembly missing.	Remote Set Fuzes Only	Visual	
g. Protective cap missing or damaged.	M433	Visual	
h. Dents, gouges or scratches in impact switch.	M433	Visual	
3. Minor:			
a. Light corrosion/rust that does not affect assembly or metal integrity.		Visual	
b. Markings faded, dim and/or partially illegible, but item can be identified.		Visual	
c. Scratches through entire protective coating.		Visual	

Table U-6. Motor

Classification	Application	Inspection Method	Inspection Description
1. Critical:			
a. Cracks, dents, or gouges in motor tube.		Visual	Para U-6k
b. Hole in motor tube forward bulkhead.		Visual	
c. Bulge on motor tube.		Visual	
d. Shorting clip missing or improperly positioned.	MK40 Motor	Visual	
e. Electromagnetic Radiation Shield (EMR) missing or damaged.	MK66 Mod3	Visual	Para U-6i
f. Broken lead wire.		Visual	Para U-6e
g. Loose nozzles on nozzle and fin assembly.	MK40 Motors	Manual	
h. Nozzle and Fin Assembly loose, cracked, dented, gouged or distorted.		Visual/Manual	Para U-6c
i. Missing, cracked or damaged fin hinge pin.		Visual	
j. Missing or damaged fin(s).		Visual	
k. Shielding and fin restraint band missing/damaged.	MK66, Mods 1,2 and 4	Visual	Para U-6i and U-8
l. Missing/damaged end shield,	MK66 Motor all Mods	Visual	Para U-6j and U-7
2. Major:			
a. Corrosion/rust on metal surfaces or threads extensive enough to prevent assembly and/or affect metal integrity.		Visual	
b. Damaged threads that would prevent assembly.		Visual	
c. Blistering or peeling paint that would require complete repainting.		Visual	
d. Marking illegible/obliterated to extent that item cannot be positively identified.		Visual	
e. Lock wire distorted or improperly assembled protrudes above surface of rocket motor tube.		Visual	
f. Missing contact disc or fin retainer.	MK40 Motor	Visual	
g. Dent or bulge in EMR shield.	MK66 Mod3	Visual	
h. Igniter circuit resistance not within prescribed limits.		Test	Para U-6d
i. Missing, damaged or loose nozzle seal/blow out seal.	MK40 Motor	Visual	
j. Missing or damaged weather seal.	MK66 Motor	Visual	
3. Minor:			
a. Light corrosion/rust that does not affect assembly or metal integrity		Visual	
b. Markings faded, dim and/or partially illegible, but item can be identified		Visual	
c. Paint blistering or peeling in spots		Visual	
d. Scratches through entire protective coating		Visual	
e. Shielding/fin restraint band improperly positioned or tape holding band to nozzle missing		Visual	Para U-8

U-6. Inspection Description.

a. In pre-1970 designs, a loose ogive (with rotation but without longitudinal looseness) does not represent a performance, safety or storability problem. For post-1970 designs, a loose ogive could represent a storability problem (seal broken) and is considered a major defect. The following defines P/Ns for the different fuze designs:

Fuze	**Pre-1970 P/N**	**Post-1970 P/N**
M423	8883683	9254708-1
M427	8883745	9254708-2

b. Torque test:

(1) Torque fixture listed in Table U-2 (formerly APE 2075M1) will be used. Warheads without fuze wrench slots may be tested using a torque wrench adapter that must be locally fabricated using drawing AXMRR-7507A. This drawing may be obtained from DAC, McAlester, OK.

(2) A line will be scribed or drawn across the junctions (fuze to warhead and warhead to motor) to provide a means of detecting movement between components. 55 foot-lbs torque will be applied in a tightening direction. Any movement at less than 55 foot-lbs is a test failure.

c. Do not attempt to twist nozzle assembly. Should the nozzle assembly wobble or move lengthwise, it is defective.

d. For MK40 series motors, perform igniter circuit resistance test IAW Ammunition Peculiar Equipment

Operational Manual and Parts List For APE 1189 Rocket Motor Continuity Tester. Igniter circuit resistance limit for MK40 series Motor: .63 to 4.0 ohms.

e. For MK66 motors, check to see if the end shield is damaged and requires replacement.

f. Gap is considered to exist if component is not seated for a full 360 degrees.

g. Criteria for gouge in warhead:

(1) M156, M257, M259, M264, M278: a gouge with visible depth will be considered a critical defect.

(2) M255A1, M261, M267, WDU-4A/A: a gouge with visible depth will be considered a major defect.

(3) M151, M229, M230, M247, M274, WTU-1/B: a gouge having a depth of 1/16" or more and length of ½" or more will be considered a critical defect; other gouges will be considered a major defect.

h. Criteria for gouge in fuze body: a gouge having a depth of 1/16" or more and length of ½" or more will be considered a critical defect; other gouges will be considered a major defect.

i. Shielding/fin restraint band is considered damaged if it contains a hole or cut through entire thickness within one inch of its aft edge. EMR shield is considered damaged if it contains a hole or crack within one inch of the aft edge of the EMR shield.

j. End shield is considered damaged if it contains a hole (other than fin pin holes) or cut through entire end shield. The end shield is bonded to the aft face of the nozzle.

NOTE

MK66 rocket motors (all Mods) with damaged or missing end shield, EMR shield, shielding/ fin restraint band, aluminum tape, or broken igniter wires are considered safe for transport or storage in approved containers.

k. While any crack or bulge in the motor tube is a critical defect, particular attention should be given to the lock wire slot/area.

WARNING

The end shield is designed to help protect the MK66 rocket motor from accidental ignition by electrostatic discharge or other sources of electricity. If the end shield is missing or damaged, the rocket motor is not considered safe to "hot-tube load". It is vital that only the aluminum tape identified below be used for repair. Anything other than metallic tape will not protect against accidental ignition.

U-7. Repair Procedures for Missing/Damaged End Shield (MK66 Mods).

a. Remove damaged end shield.

b. Inspect for damaged weather seal or igniter lead wire. Damage to weather seal is considered a MAJOR defect and a broken igniter lead wire is considered a CRITICAL defect. The weather seal is 2.5 inches forward of the aft face of the nozzle. Weather seal is considered damaged if it contains a hole or a cut through the entire weather seal. Inspect weather seal and broken lead wire for defects only if the end shield is missing or has been removed for repair due to damage.

c. Clean surface of the fin and nozzle assembly with clean rag and approved solvents.

d. Using Tape, pressure sensitive, aluminum, 3 inch wide (0.005 inch nominal thickness) procured to Fed Spec L-T-80, cut a piece of tape of sufficient area to cover nozzle assembly end. Suggested NSN for Tape is 7510-00-816-8077 and is available from regional GSA supply center.

U-8. Repair Procedures for Missing/Damaged/ Improperly Positioned Shielding/Fin Restraint Band or Missing Tape that Holds Band to Nozzle of MK66 Mods 1, 2 and 4 Rocket Motors.

a. If shielding/fin restraint band is loose or damaged, hold fins closed while removing shielding/fin restraint band. Fins are spring-actuated and may cause injury to personnel if they accidentally snap open. If fins do open accidentally, collapse the wrap around fins by pushing forward on aft surface of each fin to move fin from the deployed position to the stowed position (flush with the motor tube).

b. Apply one and one-half wraps of aluminum tape to rear area of fins. (See paragraph U-7 for type of tape to use.) Assure aluminum tape completely covers the contact band.

c. Fold back a one-inch length of aluminum tape to form a tear tab.

d. For missing ordnance tape, place a 4-inch length of ordnance tape diagonally across tab of shielding/fin restraint band and onto surface of nozzle body. Fold back a one half-inch length of ordnance tape to form a tear tab. If shielding/fin restraint band is improperly positioned, first squeeze fins and move restraint band until it completely covers contact band. Then add a 4-inch length of ordnance tape.

U-9. Lots with Suffix "AXA" or "XA" are not to be considered defective, and the presence of the extra "A" is not grounds for remarking, reclassification or submission of Quality Deficiency Reports (QDR).

U-10. References.

a. APE Operational Manual and Parts List for APE 1189 Rocket Motor Continuity Tester.

b. DMWR 9-1340-0000-F20

c. TM 9-1340-222-20

d. TM 9-1340-222-34

e. TM 43-0001-30

f. TM 43-0001-47

APPENDIX V
CHARGE, DEMOLITION, HE, LINEAR M58 SERIES AND CHARGE DEMOLITION, PRACTICE, M68 SERIES

V-1. Item Description.

a. FSC: 1375.

b. Ammunition type: Charge, Demolition, High Explosive Linear M58 Series and Charge, Demolition, Practice M68 Series.

c. Mine Clearing Line Charge (MICLIC) is a trailer mounted, rocket-towed demolition charge used to provide a clear path for combat vehicles during minefield breaching operations. The MICLIC is capable of clearing a path 14 meters wide by 100 meters long through a minefield. The launcher and trailer are fully reusable, and can be reloaded in thirty minutes.

d. The two linear charges available for use with the system are:

(1) Charge, Demolition, High Explosive Linear M58 Series. The charge assembly consists of PETN detonating cords and 700 Composition 4, unit charges, 2.5 pounds each, secured to 350 feet of nylon arresting cable. The primary explosive components are:

(a) Fuze, Electric, M1134 Series. The fuze is included in the container, but is separately packaged and is not connected to the charge assembly until item is prepared for deployment. Safe/arm mechanisms prevent initiation of the linear charge prior to launch. A window in the cylinder side of the fuze allows display of the safe/arm status of the fuze (green for safe, red for armed).

(b) Rocket Motor MK22 Series: A 5" rocket motor is used to tow the linear charge across the minefield. Item description and inspection criteria are contained in TM 9-1375-215-13&P, Operator's, Unit, Direct Support, and General Support Maintenance Manual Including Repair Parts and Special Tools List - Demolition Kit Mine Clearing Line Charge (MICLIC).

(2) Charge, Demolition, Practice, M68 Series. The item is a non-explosive linear charge used only for training sessions. Rubber is used to simulate the explosive pellets in the unit charges. The charge can be launched a maximum of three times. The M68 series contains an inert fuze, but uses a live MK22 series rocket motor.

V-2. Unique Safety Precautions.

Do not operate radio frequency transmitters within five feet of the M58 Series charge, or rocket motor. Safe distances from high-powered transmitters are included in Chapter 6, DA PAM 385-64. Positive steps (conductive floor, mats, etc.) will be taken to eliminate static discharges.

V-3. Testing and Equipment Requirements.

Table V-3 identifies depth gage and torque wrench requirements.

V-4. Inspection Category and Sampling Plan.

a. Inspection Category X: periodic inspection interval - 4 years. Periodic inspection sample size and accept/reject criteria will be according to Chapter 2.

b. Charges held by using units in Basic Load will be inspected on an annual basis according to Chapter 9 and this appendix.

V-5. Specific Inspection Points. The linear charge will be inspected and defects classified according to Chapter 2 and Tables V-1 through V-4 of this appendix.

Table V-1. Packaging Defects, M58 and M68 Series.

Classification	Application	Inspection Method	Inspection Description
1. Critical:			
a. Warning stencil (or decal) on pallet cover or pallet back missing or illegible.		Visual	Para V-6a
2. Major:			
a. Damage to container exposing contents, or preventing intended use (penetration, dents, etc.).		Visual	Para V-6b
b. Cover not secured properly in place.		Visual	
c. Rust or corrosion compromising container integrity or markings.		Visual	
d. Rocket motor electrical receptacle (bottom receptacle) detent not in proper position.		Visual	Para V-6n
3. Minor:			
a. Strapping loose, broken or improperly applied.		Visual/Manual	Para V-6c
b. Protective coating (paint) missing.		Manual	
c. Marking missing, misleading or unidentifiable.		Visual	
4. Incidental:			
Shipping bracket and/or retaining pin missing.		Visual	

Table V-2. Packaging Defects, Fuze M1134 and M1147 Series.

Classification	Application	Inspection Method	Inspection Description
1. Critical: None defined.			

2. Major:			
a. Carton damaged, exposing inner pack.		Visual	
b. Contents loose.	M1134	Manual	
c. Carton wet.	M1134	Visual/Manual	Para V-6d
3. Minor:			
a. Marking missing, misleading, or unidentifiable (outer or inner carton and barrier bag).		Visual	
b. Carton damp.		Visual/Manual	Para V-6d
c. Barrier bag not evacuated or carton corners not blunted.	M1134	Visual	Para V-6e

Table V-3. Item Defects, Linear Charge M58 and M68 Series.

Classification	Application	Inspection Method	Inspection Description
1. Critical:			
a. Shorting loop missing or assembled improperly.	M58	Visual	Para V-6f
b. Linear charge improper type	M68	Visual	
c. PETN end caps seated in fuze connector front half not below flush.	M58	Visual/Gage	Para V-6p
d. Arming wire knurled nut below flush.	M58	Visual/Gage	Para V-6q
e. Fuze improper type.	M68	Visual	Para V-6g
2. Major:			
a. Components missing or damaged.		Visual	
b. Fuze missing or improper type.	M58	Visual	Para V-6g
c. Linear charge improper type.	M58	Visual	
d. Flaking of first layer improper, layer not reversed faked, or layer with incorrect number of rows.		Visual	Para V-6h
e. Line missing from locked safety switch to charge.	M58	Visual	
f. Arresting cable hook not secured into pallet eye.		Visual	Para V-6i
g. Item wet.		Visual/Manual	Para V-6d
h. Improper orientation of cable guide in rocket motor cable receptacle.		Visual	Para V-6m
i. Electrical leads under the nylon sock with missing or improper tape.		Visual	Para V-6o
j. Rocket motor receptacle detent not in the 12 o'clock position.		Visual	Para V-7a
k. Crushed/damaged wires in junction box.		Visual/Test	Para V-7b
l. Arming wire knurled nut out of tolerance but above flush.	M58	Visual/Gage	Para V-6q
m. Snap hook improperly positioned.	M58	Visual	Para V-6r
n. Hose clamp torque below 31 inch lbs.	M58	Gage	Para V-6q
3. Minor:			
a. Knots in line to switch not coated.	M58	Visual	
b. Item damp.		Visual	Para V-6d
c. Arming wire knurled nut out of tolerance but above flush.	M58	Visual/gage	Para V-6q

Table V-4. Item Defects, Fuze M1134 and M1147 Series.

Classification	Application	Inspection Method	Inspection Description
1. Critical:			
a. Red warning stencil (or decal) missing or illegible.	M1134	Visual	Para V-6j
b. Fuze armed.		Visual	Para V-6k
2. Major:			
a. Item damaged so as to be unusable.	M1147	Visual	
3. Minor:			
a. Protective coating (paint) missing, incomplete, or damaged.		Visual	
b. Dust cap missing.		Visual	Para V-6l

V-6. Inspection Description and Notes.

a. Stencil (or decal) reads: "WARNING - ASSURE THAT FUZE IS NOT ARMED AND COTTER (SHEAR) PIN IS IN PLACE PRIOR TO FIRING".

b. The M58 shipping and storage container must be evaluated for the following:

(1) Damage that impairs structural integrity of container.

(2) Damage that would preclude loading of container onto MK55 launcher.

(3) Damage to electrical connector jacks to include missing protective caps.

c. Apply two 1¼ inch steel straps around container. Straps will be located 6 inches toward center from each skid. Corner protectors will be placed under strapping to prevent damage.

d. Packing material or items that are wet should be disposed of according to established procedures. Packing material of items that are damp should be allowed to dry thoroughly prior to repacking and storage.

e. Barrier bags will be evacuated, and sealed or taped closed.

f. Shorting loop is visible at the fuze holder end of arresting cable.

g. Electric fuze M1134 Series for M58 Series Linear Charge and M1147 Series for M68 Series Linear Charge.

h. Faking is a method of coiling a rope or line to allow free running. The method of faking is described in drawing 8845322. The bottom layer of charge will have 11 rows. Each successive layer will have 12 rows, except top layer.

i. For the M68, any damage that cuts rope core is a cause for rejection.

j. Stencil reads: "WARNING - BOTH SHEAR PIN AND GREEN INDICATOR MUST BE VISIBLE BEFORE FIRING".

k. A window in the cylinder side of the fuze allows display of the SAFE/ARM status (green for safe, red for armed) of the fuze. If the fuze is armed, do not attempt to disarm the fuze. Pack armed fuze in an available cardboard or wooden box marked "ARMED FUZE". Request ASP or EOD assistance in disposal, or initiate immediate demilitarization action (if qualified personnel are available). Keep armed fuze isolated from other explosives, preferably with detonators against a sand bag, or other barrier, in a sturdy box (used ammunition box). Corners of fuze carton will be blunted to preclude damage to charge.

l. Replace dust cap.

m. Proper orientation of cable guide in rocket motor cable receptacle (bottom receptacle) is the 12 o'clock position.

n. Proper orientation of detent in rocket motor electrical receptacle is the 12 o'clock position.

o. Electrical leads under the nylon sock must be taped using a paper type tape like masking tape.

p. Gaging of PETN endcaps should be done using non-sparking straight edge.

q. Inspection for knurled nut tolerance:

(1) Care must be taken to obtain accurate data.

(2) Conduct Length (L) and Distance (D) measurements and assess the overall condition as follows:

(a) Before proceeding with the L and D measurements, first, measure the torque (inch-pounds) on the screw, which is a component on the hose clamp that is attached to the fuze connector – rear half. Record the torque. Determine the defect classification from the following formula:

(b) Remove the hose clamp from the fuze connector rear half and slide the protective nylon encasement sleeve away from the fuze connector so that the arming wire is visible.

(c) Measure Length (L) in inches as shown in Figure V-2 from the central axis of the Fillister head screw to Point B on the arresting cable. Record this measurement.

(d) Measure Distance (D) from the front face of the knurled nut to the front face of the fuze connector as follows:

1. Grasp the fuze connector end of the arresting cable and hold it vertically as shown in Figure V-3. Next, gently grasp the rope between Points B and C. Finally, utilizing another person, gently grasp the knurled nut.

2. Ensure that the rope is straight (see Figure V-3) by applying only a SLIGHT amount of tension to the rope. Do NOT apply an excessive amount of tension; this will lengthen the rope and ruin the measurement.

3. Ensure that the fuze connector is straight (see Figure V-3) with respect to the rope (i.e. the fuze connector is NOT cocked at an angle). A cocked fuze connector will also ruin the measurement.

4. Ensure that the arming wire is straight (see Figure V-3) by applying only a SLIGHT amount of tension to the wire. Do NOT apply an excessive amount of tension; this will deform the rope and ruin the measurement. Also, ensure that the ball end of the arming wire is firmly seated in the bottom of the knurled nut as shown in Figure V-4.

5. Ensure that the front face of the knurled nut is parallel with the front face of the fuze connector as shown in Figure V-5 (i.e. the knurled nut is NOT cocked at an angle).

6. To the nearest 0.05 inch, measure Distance “D” from the front face of the knurled nut to the front face of the fuze connector (Figure V-5). Distance “D” is POSITIVE when the front face of the knurled nut is above the front face of the fuze connector (Figure V-5). In contrast, when the front face of the knurled nut is below the front face of the fuze connector, “D” is NEGATIVE (Figure V-5). When the front face of the knurled nut is below the front face

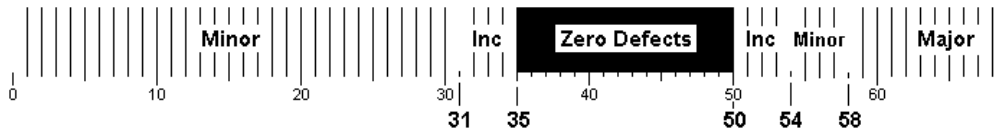
of the fuze connector, make certain that the tip of the depth gage contacts only the front face of the knurled nut as shown in Figure V-6.

7. Record the measurement on the data sheet. If "D" is negative, be sure to record the measurement with a minus sign.

(e) Determine the defect classification of the L and D combination see Figure V-7. The knurled nut below flush is always a critical defect.

r. Snap hook opening must face up away from the wall of the container.

Figure V-1. Hose Clamp Torque Specification.



FigureV-2. Length L Is Defined.

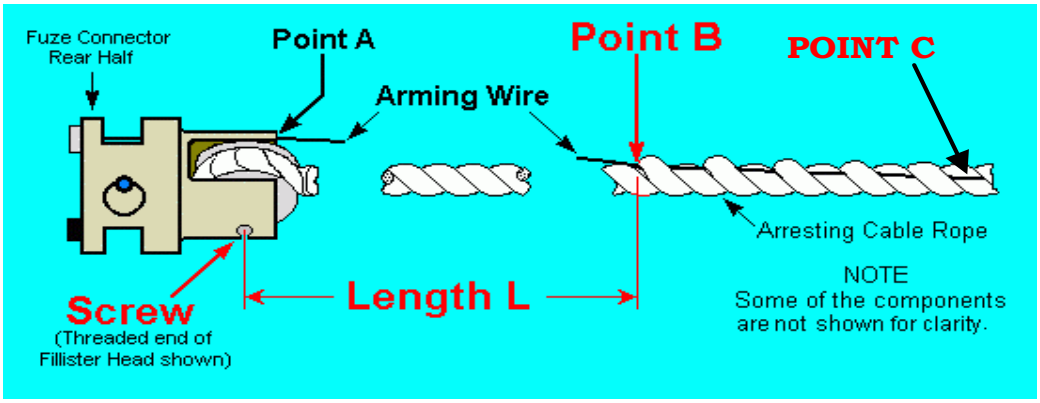


Figure V-3. Correct and Incorrect Inspection Configurations.

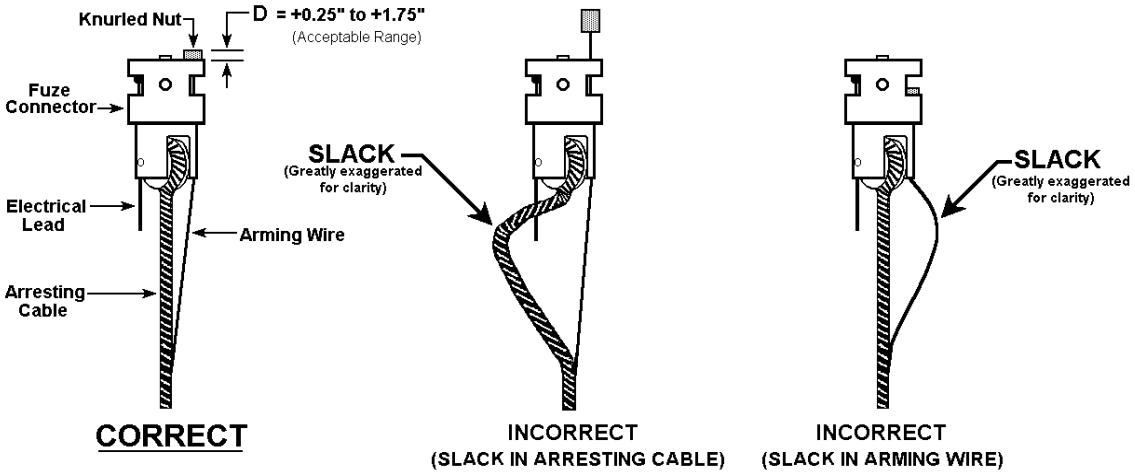


Figure V-4. Right and Wrong Positions of the Ball End of the Arming Wire.

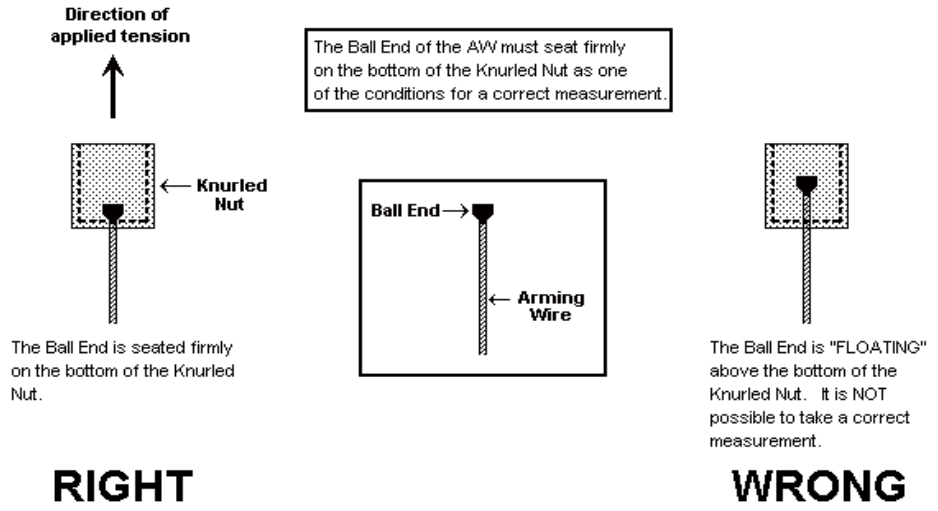


Figure V-5. Positive and Negative Ranges of Distance "D" Values

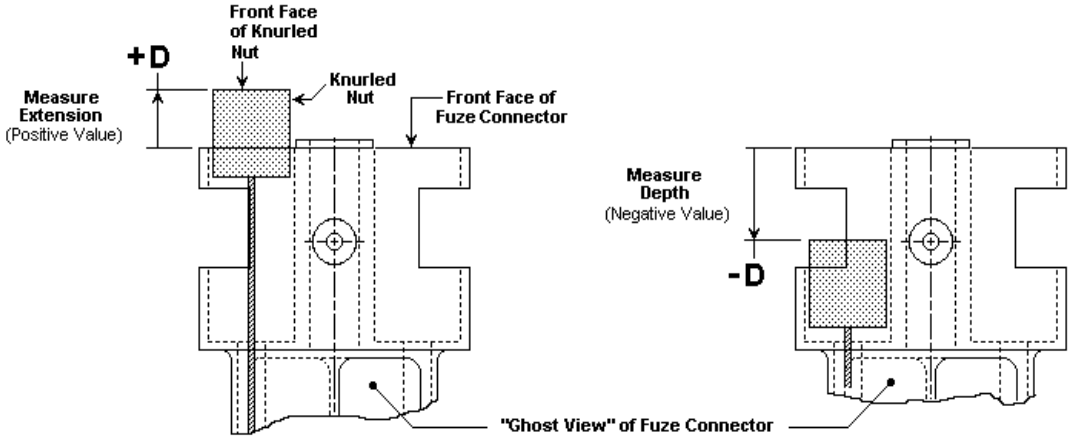


Figure V-6. Right and Wrong Depth Gauge Measurement Methods.

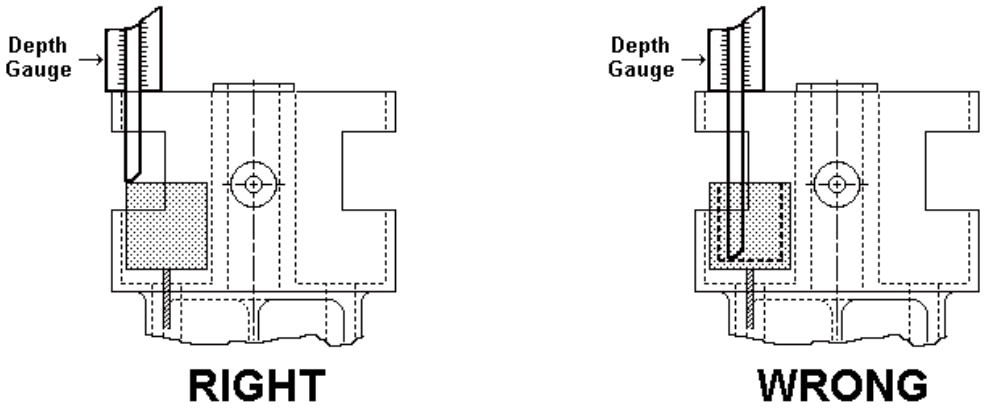
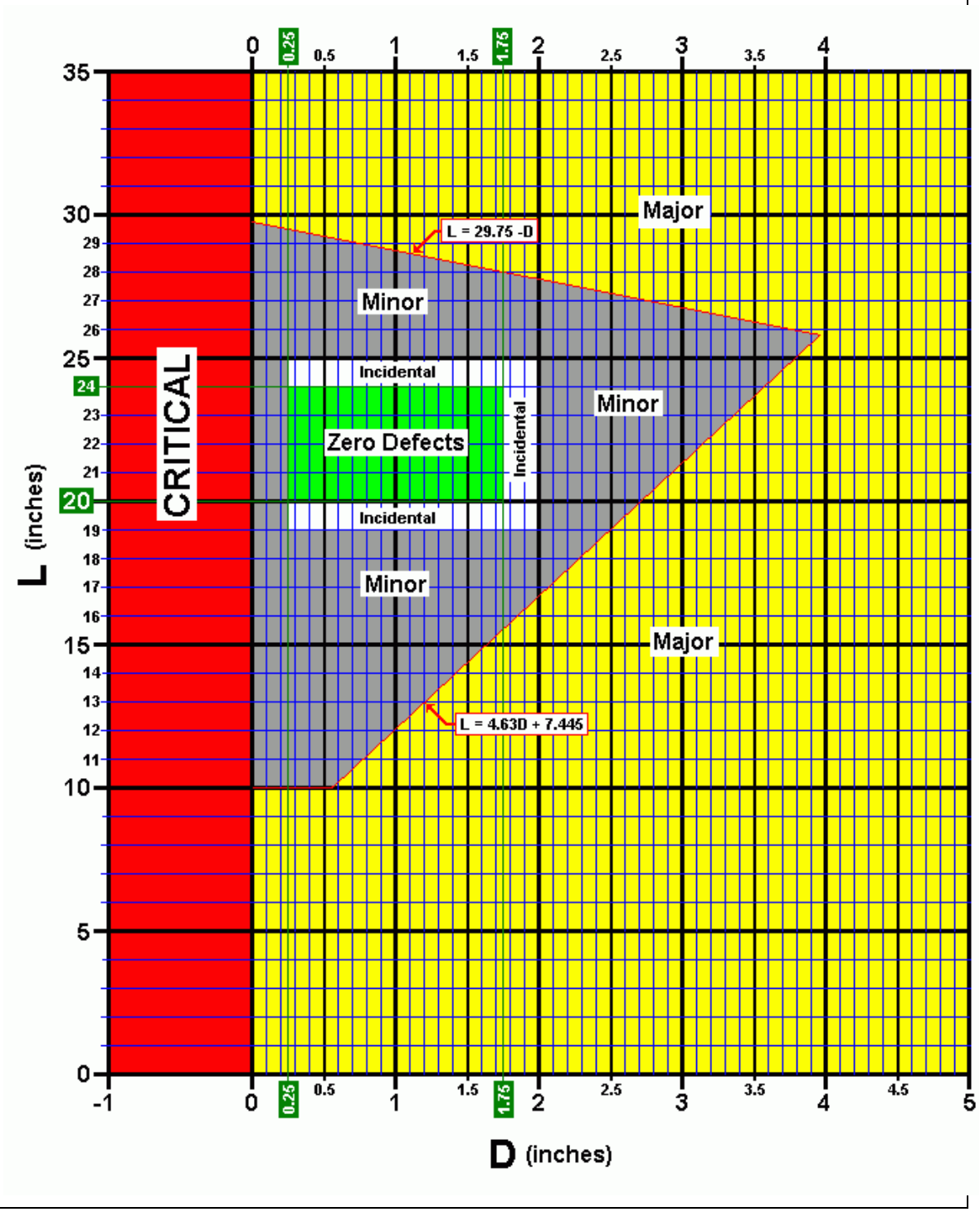


Figure V-7. Defect Classification of the L and D Combination.



V-7. Pre-issue Inspection of M58 Charges and M68 Practice Charges.

Pre-issue Inspections will be performed on all M58 and M68 series linear demolition charges by issuing installations. Charges will be inspected for:

a. Proper orientation of the detent in the rocket motor receptacle on the junction box. The rocket motor receptacle is the bottom receptacle. The detent should be in the 12 o'clock position.

b. Crushed/damaged wires in the junction box. Inspection procedures are as follows:

(1) Use a digital multimeter set to read ohms and capable of providing an audio alert when continuity or closed circuit is read.

(2) Remove protective caps from receptacles on linear charge junction box.

(3) Place one multimeter lead on receptacle #1, pin "A". Place other lead on receptacle #3, right side pin. Multimeter should register continuity. Receptacle #1 is the top receptacle. Receptacle #2 is the middle receptacle. Receptacle #3 is the bottom receptacle.

(4) Place one lead on receptacle #3, right side pin. Place other lead on shell of receptacle #3. There should be no continuity.

(5) Place one lead on receptacle #3, right side pin. Place other lead on right edge of panel between receptacles #2 and #3. Scratch paint to bare metal. There should be no continuity.

(6) If continuity is indicated in steps 4 and/or 5 then the junction box has damaged wires. Remove the junction box panel and verify the condition.

V-8. References.

a. DMWR 9-1375-000-X20.

b. FM 5-25.

c. TM 9-1375-215-13&P.

d. TM 43-0001-38.

APPENDIX W
CANINE EXPLOSIVE SCENT KIT

W-1. Item Description.

a. FSC: 1375.

b. Ammunition Type: Explosive Scent Kit, Canine.

c. Canine Explosive Scent Kit is designed to provide realistic training for sentry dogs and increase their proficiency to search and detect various amounts of explosive materials used by terrorists and subversives. Kit consists of eight numbered M19A1 ammunition cans overpacked in a wooden box. Seven cans contain an identified explosive material. One container is empty to allow for addition of another type of explosive material that may be required in future.

d. Explosive material contained in kit:

(1) Container 1: Explosive, Water Gel, quantity - 6 each 0.5 lb lengths, NSN 1375-01-180-5779 MY77.

(2) Container 2: Propellant powder (Smokeless Powder) (IMR), quantity - 2 each 1 lb containers, NSN 1376-00-772-1370 MY57.

(3) Container 3: No explosives.

(4) Container 4: Charge, Demolition Block M112, quantity - 3 each 1.25 lb blocks, NSN 1375-00-724-7040 M023.

(5) Container 5: Charge, Demolition Block 0.5 lb. TNT, quantity - 6 each .0.5 lb blocks, NSN 1375-00-926-9316 M031. Due to short supply of M031, the following substitutions have been allowed by JMC Inventory Management: Charge, Demolition Block 0.25 lb TNT, quantity 12 each, 0.25 blocks, NSN 1375-00-580-1377 or 1375-00-926-9394 M030; or Charge, Demolition Block 1.00 lb TNT, quantity 3 each, 1.00 blocks, NSN 1375-00-935-6139 M032.

(6) Container 6: Cord, Detonating, quantity - 6 each 5 ft. lengths, NSN 1375-00-180-9356 M456.

(7) Container 7: Dynamite, 75% Ammonium Nitrate, quantity - 6 each 0.5 lb. sticks, NSN 1375-01-494-9223 MN85.

(8) Container 8: Dynamite, 40% Nitroglycerin, quantity - 6 each 0.5 lb. sticks, NSN 1375-00-096-3095 M587.

(9) The above listed contents may be stored in M19A1 cans NSN 8140-00-828-2938. The M19A1 cans will fit into wooden box NSN 8140-01-194-8044.

e. Shelf-life requirements:

(1) NSN 1375-01-494-9223 MN85 Dynamite, 75% Ammonium Nitrate - 18 months.

(2) NSN 1375-00-096-3095 M587 Dynamite, 40% Nitroglycerin - 18 months.

(3) NSN 1375-01-180-5779 MY77, Explosive, Water Gel, - 12 months (Note: when Water Gel (MY77) ages it loses energetic properties, but does not lose scent necessary for use in canine training). See paragraph W-6.f.

(4) Commercial Dynamite is assigned eighteen (18) month shelf-life (S/L) IAW TB 9-1300-385, Appendix D. QASAS are authorized to extend S/L six (6) months in one (1) month increments, not to exceed twenty-four (24) months total S/L. Upon expiration of the eighteen (18) month S/L, inspection shall be performed every thirty (30) days to verify serviceability.

W-2. Unique Safety Precautions.

a. Extreme care is necessary when handling commercial dynamite due to greater sensitivity to heat and shock than other commonly used explosives. Avoid contact of exudate with bare skin. Respiratory protection from vapors is required in non-ventilated areas. Handling of Nitroglycerin-based explosives may cause severe headaches. Personnel handling commercial dynamite will wear appropriate personnel protective equipment (PPE). Contact you installation industrial health/hygiene office for assistance.

(1) Inspection personnel will wear Nitrile latex free gloves at all times when handling dynamites. Cotton or leather gloves may be worn over the Nitrile gloves if heavy work is being performed. The disposal of the cotton/leather gloves is IAW requirements of the installation safety/environmental officer. Operators should always wash their hands after handling dynamite regardless of whether or not they are wearing gloves.

(2) Inspectors will wear a half-face or full-face respirator with organic vapor cartridges if operations are performed in poorly ventilated areas. If large amounts of dust are present during repackaging or inspection operations, organic vapor/p100 combination cartridges should be used. All operators who wear respirators must be fit-tested, receive respiratory protection training IAW OSHA's respiratory protection standard, 29CFR1910.134 and be medically certified for use of a respirator.

b. Exuding dynamite is highly sensitive and shall be handled carefully to prevent accidental initiation. Avoid contact of exudate with bare skin. Respiratory protection from vapors is required in non-ventilated areas.

c. Packaged charges dropped in excess of six feet, or an unpacked demolition charge dropped in excess of three feet shall be considered unserviceable, turned in, and reported in accordance with local procedures.

d. Commercial dynamite that has deteriorated from age or other causes can be identified by liquid exudate, or soft, mushy feel to the sticks. Commercial dynamite exposed to humidity or relatively high temperatures deteriorates at an accelerated rate. Engineering evaluation determined that the presence of oily stains on the sticks or wrapping paper does not present a significant explosive hazard. Liquid exudate, largely a function of exposure to humidity, does present a potential explosive hazard. Liquid exudate consists of a measurable substance (actual drops or pooling). Exuding dynamite is highly sensitive and shall be handled carefully to prevent accidental initiation. Such dynamite should not be used, nor should packages be opened. See paragraph W-6i.

e. Ammonium nitrate, in presence of some organic materials, becomes more sensitive and subject to auto ignition. Ammonium nitrate dynamite with exposed

explosives should be handled with caution.

W-3. Testing and Equipment Requirements.

Smokeless powder, 1376-00-772-1370 MY57, is part of the propellant stability program. The MY57 is used in the MN01. The MY57 propellant test results from the propellant stability program are required to be placed on the canine explosive scent kit DSR.

W-4. Inspection Category and Sampling Plan.

a. Canine Explosive Scent Kit, in depot storage, is assigned no inspection category: periodic inspection interval - one (1) year. Sample size will be 20, or entire lot if total quantity is less than 20. Accept/reject criteria will be in accordance with Table 2-2 for depot stored stocks.

b. Annual periodic inspections will be scheduled to follow hottest portion of year. To the maximum extent possible, material in the kit should have only limited exposure to prolonged high temperatures and humidity (even moderately high temperatures of 75 to 80 degrees Fahrenheit have brought the onset of staining and liquid exudation of commercial dynamite).

c. Annual basic load inspection will be performed on kits in the hands of using units in accordance with Chapter 8. Inspection will be performed by a QASAS. Defects will be identified and classified in accordance with Table W-1. Kits containing commercial dynamite will be inspected at the conclusion of the hottest portion of the year. A representative sample will be selected and examined for evidence of nitroglycerin (liquid or crystal) exudation on the exterior of the stick and/or packing material.

W-5. Specific Inspection Points.

Items will be inspected and classified according to this supply bulletin and Table W-1.

W-6. Inspection Description and Notes.

a. Commercial dynamite when stored in temperatures exceeding 70 degrees Fahrenheit will require increased surveillance procedures to inspect for presence of exudation. Exuding dynamite, identified by a liquid substance and/or crystallization appearing on casing or sticks, will not be issued or used. Crystals of nitroglycerin appear yellow to dark amber. The manufacturing process allows for small pieces of inert filler to migrate outside the wrapping. The filler is beige to gray and not cause to reject the dynamite. The liquid substance is the result of absorption/adsorption of liquid by inorganic salts EGDN and traces of NG (nitroglycerin). It occurs in the exposure of the dynamite to high or prolonged levels of humidity. The wax coating of the dynamite sticks may also deteriorate. The deteriorated wax coating is normally a powdery light colored substance and does not present an explosive hazard. Dynamite exhibiting liquid exudation may be more sensitive and should be destroyed immediately in accordance with local procedures.

b. Commercial dynamite when stored in temperatures below 32 degrees Fahrenheit will be inspected for being frozen by using the Pin Test. A common pin will not penetrate frozen dynamite but can be pushed quite readily into dynamite that is merely stiff or hard. Frozen dynamite will be destroyed immediately in accordance with local procedures.

c. Damaged boards will be replaced. New box should be constructed from locally available material. Box will be marked in accordance with applicable drawings.

d. Remove nail and replace with nail of correct size and length.

e. Repair using scotch transparent tape, or equivalent.

f. Explosive water gel shelf life:

(1) Determining Water Gel date of manufacturing (DOM):

Water Gel is purchased as an off-the-shelf item and lot numbers may not correspond to standard lot numbering. Use the following examples to determine DOM and shelf life expiration dates:

(i) Lot: 262318FE92N5.
Date of Manf: 18 Feb 1992.
Shelf Life expires: 28 Feb 1993.

(ii) Lot: SEC08DEC01.
Date of Manf: 08 Dec 01.
Shelf Life expires: 31 Dec 2002.

(iii) Lot: 30AU06X2.
Date of Manf: 30 Aug 06.
Shelf Life expires: 31 Aug 07.

(2) Water gel under 12 months old and visually serviceable will be classified in CC-A.

(3) Water gel over 12 months old (expired shelf life), but still visually serviceable, will be classified to CC-B (B62 - restricted to use in canine scent kit) and retained for canine training. These assets may remain in Canine Scent Kits as long as they remain visually serviceable.

(a) Excess Water Gel with expired shelf life removed from scent kits but still visually serviceable, will be retained in CC-B (B62 - restricted to use in canine scent kit) and reported to the addressee in paragraph 1-5.d(20)(i).

(b) Unserviceable Water gel removed from canine scent kits will be classified accordingly and handled IAW local explosive disposal procedures. In addition, the requirement for the kit remains 6 ea sticks, inspection rejects are based solely on individual items from that kit. A single damaged water gel stick should not be used to justify the rejection of the remaining five water gel sticks.

g. Remove damp/wet sawdust, place in plastic bag and turn in for demolition. Replace with fresh sawdust from local sources.

h. Clean by brushing with copper or aluminum (non-sparking) brush (round brush preferred).

i. In recently manufactured dynamite, the nitroglycerin or nitro-cotton materials are produced in encapsulated micro-bubbles and do not leak/exude like older production dynamite. New production dynamite may have dark brown spots and colorations. It may also have a slick feel due to a wax coating

applied to the outer wrapper. These are not defects unless accompanied by a liquid exudates or nitroglycerin crystallization.

j. Empty, burnable (not treated with PCP) containers that have been used for dynamite will be destroyed by burning, in compliance with local environmental regulations and AMC-R 755-8. Oily stains of nitroglycerin will be scrubbed off non-burnable containers with a mixture of following solutions:

(1) Solution A. Sodium sulfide (pulverized) - 9 parts by weight, and water - 30 parts by weight.

(2) Solution B. Denatured ethyl alcohol - 70 parts by weight and acetone - 20 parts by weight. Immediately before decontaminating nitroglycerin, combine above solutions. If solutions are mixed and then stored, potency diminishes. Use of this mixture should be limited to very small quantities, such as oily film that adheres to surfaces after nitroglycerin has been removed with sponges or absorbed in wood pulp or sawdust. Operators using this solution should wear rubber gloves.

k. Clean and repack.

l. Repair using scotch transparent tape, or equivalent.

m. Demolition blocks will be dried; mildew or mold will be removed by wiping with a cloth or a bristle brush. Drying will be by natural means, no artificial heat will be utilized.

n. Special packaging instruction #ADPLBOX012 contains instructions for the preparation of light boxes of dynamite and water gel for use in the dog scent kit.

W-7. References.

a. SB 742-1375-94-423.

b. TM 9-1300-214.

c. TM 9-1375-213-12.

d. TM 9-1375-213-34.

e. TO 11A20-16-7.

Table W-1. Item Defects and Method of Inspection.			
Classification	Application	Inspection Method	Inspection Description
1. Critical:			
a. Smokeless powder absorbing moisture.		Visual	
b. Smokeless powder container broken or leaking.		Visual	
c. Smokeless powder container missing top.		Visual	
d. Exudation (liquid substance) on commercial dynamite.		Visual	Para W-6a
e. Crystallization on commercial dynamite.		Visual	Para W-6a
f. Commercial dynamite frozen.		Manual	Para W-6b
2. Major:			
a. Outer pack weathered or damaged to extent that contents cannot be protected.		Visual	Para W-6c
b. Outer pack with nail protruding into interior of box.		Visual	Para W-6d
c. Metal containers damaged.		Visual	
d. Water gel explosive plastic covering punctured, broken, torn, cut, gouged or otherwise damaged, exposing explosive.		Visual	Para W-6e
e. Water gel explosive with expired shelf life.		Visual	Para W-6f
f. Commercial dynamite with expired shelf life.		Visual	
g. Water gel explosive packing (sawdust) damp or wet.		Visual	Para W-6g
h. Charge, demolition block .5 lb. TNT crushed or with exudation, crumbling, disintegration of covering and cracking of explosive surface.		Visual	
i. Charge, demolition block .5 lb. TNT activator well plugged with foreign matter.		Visual	Para W-6h
j. Charge, demolition block .5 lb. TNT Fiberboard container of end plates cut, torn, gouged, or otherwise damaged to extent that explosive is exposed or flaking.		Visual	
k. Detonating cord broken, chewed, mutilated, exposing explosive.		Visual	
l. Detonating cord soaked (water).		Visual	
m. Commercial dynamite wrapping loose, cut, torn, gouged, or otherwise damaged to extent that explosive is exposed.		Visual	
n. Commercial dynamite cartridge (sticks) broken.		Visual	
o. Commercial dynamite having a dark color is soft and mushy.		Visual/Manual	Para W-6i
3. Minor:			
a. Outer pack with board(s) loose, split, or warped.		Visual/Manual	
b. Outer pack with evidence of dry rot, mildew, mold, dampness, or termite infestation.		Visual	
c. Outer pack missing wooden knot, size and location being such that material is not adequately protected.		Visual	
d. Outer pack markings missing, misleading, incomplete, or unidentifiable.		Visual	
e. Inner pack markings missing or obliterated.		Visual	
f. Container contaminated with explosives.		Visual	Para W-6j
g. Smokeless powder loose in M19A1 container.		Visual	Para W-6k
h. Demolition charge, M112 Mylar film covering punctured, torn, cut, gouged or otherwise damaged to extent that explosive is exposed.		Visual	Para W-6l
i. Demolition charge, M112 protective cover strip missing.		Visual	
j. Charge, demolition block .5 lb. TNT with presence of mildew, mold or dampness.		Visual	Para W-6m

APPENDIX X
FUZES, ARTILLERY

X-1. Item Description.

a. FSC: 1390.

b. Ammunition Type: Artillery fuzes, including mechanical time (MT), mechanical time super quick (MTSQ), point detonating (PD), proximity (VT) and electronic time (ET) and multi option fuze artillery (MOFA). Mortar fuzes included in other appendices are not covered.

c. For a complete description and related data, refer to Chapter 7 of Army Ammunition Data Sheets (Federal Supply Class 1315, 1320 and 1390) and applicable Drawings.

X-2. Unique Safety Precautions.

a. No unique safety precautions are applicable to this item.

b. Proximity fuze M732 is required to be stored with the base up IAW DWG 19-48-4116-PA1002/156G. This prevents deterioration of the power supply. The container requires stencil markings showing an arrow pointing toward the bottom of the wire bound box and the word 'up'. Containers should be maintained inverted in storage. Orientation of boxes should be an inspection point at time of sample selection.

X-3. Testing and Equipment Requirements.

a. Torque test fuzes IAW Table X-1 utilizing the APE 1223 torque fixture. The fuze torque test will be conducted during receipt inspection on a sampling basis as determined by the QASAS in charge. Paragraphs 2-3b(1) and (2) apply. This determination should be based on past and present inspection data.

b. The M571, M592 and M711 and M762/M767 Series fuzes are hand settable with a plunger which provides locking of lower cap in flight. These fuzes do not require a fuze setting torque test.

c. M762/M767 Series fuzes are hand settable without the aid of a tool and do not require a fuze setting torque test since the electronics lock the setting in flight.

X-4. Inspection Category and Sampling Plan.

Inspection interval and sampling plan will be IAW Chapter 2.

X-5. Specific Inspection Points.

Item will be inspected and classified IAW Chapter 2 and Table X-2. Disposition and proper handling of packing materiel will be IAW paragraphs X-6g and h.

X-6. Inspection Description and Notes.

a. Fuzes assembled to complete cartridge rounds will be removed from cartridge prior to testing. Torque is to be applied in the direction of increasing time and with a continuous motion. Desirable method is to complete test in one revolution of setting (lower) cap. In case of an over-run when setting fuze on 'safe' or 'MA', cap will not be backed off but rotated through a complete cycle.

b. Proximity (non-metallic ogive).

c. All fuzes with booster.

d. All MT, MTSQ and three (3) proximity fuzes (M514A3, M728 and M732) listed in Table X-1 require a torque test.

e. All except proximity and solid nose types.

f. Disposition of fuzes bulk packed or assembled to complete rounds that fail torque requirements but not sufficient in number to reject entire lot will be as follows:

(1) Fuzes from bulk pack lots will be authorized for local destruction.

(2) Fuzes removed from cartridges for test will be reassembled to round, tagged, segregated and reported according to provisions of this supply bulletin.

g. Packs selected for item inspection purposes will be kept to a minimum. Additionally, all subject packs which are opened will be marked 'Surveillance Samples: not to be shipped until entire lot quantity is exhausted' and used on a recurring basis for future inspections.

h. When opening bulk pack fuzes in M2A1 cans for item inspection purposes, containers will be left open for a minimum amount of time:

(1) When possible, desiccant packed in M2A1 container will be replaced with fresh desiccant prior to repack.

(2) Desiccant to be reused, and Styrofoam packing supports removed from M2A1 cans must be stored in an approved desiccant container during item inspection. When containers are not available, Styrofoam supports and desiccant will be placed back into M2A1 cans immediately after fuze samples have been removed. Cans will then be closed and not re-opened until fuzes are repackaged.

i. M728 and M514A1E1 (M514A3) fuzes will be classified defective if index line is off the 10 second shipping position by 3-seconds or more.

j. Crack in setting window is a major defect if it pierces the window permitting entry of moisture or obstructs view of setting scale. Surface stress marks/ cracks are not defects.

k. Fuze not set on 'S' position is considered a major defect for M565 fuze model. When discovered 'OFF-S' during inspection, reset samples to 'S'. There is no hazard for use, handling or transportation.

l. M564 fuzes, which have verniers over 1 interval to right or left of 'S' position, are considered critical defectives. If encountered, investigate possibility that fuzes could be field returns, not representative of lot.

m. Humidity indicator cards are no longer required for current or future production of Fuze, M762/M767 Series. An Engineering Change Proposal (ECP) has been approved to remove the humidity indicator card from the packaging configuration. In drawing 8864492 Rev BA, 31 Jan 98, subject: Box Ammo Metal for Artillery Type and Rocket Fuzes, paragraph PP 9 requiring humidity indicator card is deleted in its entirety. M762/M767 Series is accepted

'AS IS' and replacement or repacking of the indicator cards is not required. Lots in condition code Lima (L) for humidity card defects will be returned to appropriate condition code based on inspection results. No action will be taken on Ammunition Condition Report (ACR) DA Form 2415 submitted for deficiencies with humidity indicator cards for subject items. Disregard humidity indicator card reading for M762/M767 Series fuzes.

n. Part of the M762/M767 Series fuze packaging includes a barrier bag inside the ammunition can. M762/M767 Series fuze barrier bag being torn or missing is not cause to reject the lot.

Table X-1. Fuze Setting Torque Test Requirements.

				# Below Min		# Above Max		
Model	**Inspection**	**Torque Limits Inch-Pounds**	**Sample Size**	**Accept**	**Reject**	**Accept**	**Reject**	**Application**
M501, MTSQ	RI, PI	50-300	20	2	3	2	3	Lower cap assembly
M501A1, MTSQ	RI, PI	50-300	20	2	3	2	3	Lower cap assembly
M520, MTSQ	RI, PI	50-300	20	2	3	2	3	Lower cap assembly
M520A1, MTSQ	RI, PI	50-300	20	2	3	2	3	Lower cap assembly
M548, MTSQ	RI, PI	60-300	20	1	2	2	3	Lower cap assembly
M563, MT	RI, PI	60-300	20	1	2	2	3	Lower cap assembly
M564, MTSQ	RI, PI	60-300	20	1	2	2	3	Lower cap assembly
M565, MT	RI, PI	60-300	20	2	3	2	3	Lower cap assembly
M514A3, PROX. RI, PI	RI, PI	100-300	20	2	3	2	3	Lower cap assembly
M728, PROX	RI, PI	100-300	20	2	3	2	3	Lower cap assembly
M732, PROX	RI, PI	100-300	20	2	3	2	3	Lower cap assembly

Table X-2. Item Defects and Method of Inspection.

Classification	Application	Inspection Method	Inspection Description
1. Critical:			
a. Fuze with missing or broken safety pin or clip.	M501A1, M520	Visual	
b. Fuze not set to safe 'S' position.	M564	Visual	Para X-6l
c. Ogive and head assembly loose (removable by hand pressure).	M48 Series, M51 Series, M557, M572	Visual/Manual	
d. Head assembly loose (removable by hand pressure).	MK399 Mod 1	Visual/Manual	
2. Major:			
a. Cracked ogive.	Para X-6b	Visual	
b. Threads damaged to the extent precluding assembly.	All	Visual	
c. Pull wire not inserted proper depth.	M520	Visual	
d. Fuze not set on muzzle action (MA). MA line on lower cap not in line with zero line on body.	M563, M571, XM711	Visual	
e. Ogive loose interferes with setting sleeve.	M48 Series, M51 Series, M557, M572	Visual	
f. Hairline and number not visible through window.	M577, M582	Visual	
g. Fuze setting not in shipping position (93.5-95.5 seconds).	M577, M582	Visual	
h. Fuze not set on 'SQ'.	M48A3, M51A5, M557	Visual	
i. Booster cup damaged or loose pellets.	Para X-6c	Visual	
j. Fuze fails torque test.	Para X-6d	Manual	Para X-6a, Para X-6f
k. Crack in setting window.	M577, M582	Visual	Para X-6j
l. Fuze not set to 'S' position.	M565	Visual	Para X-6k
m. Liquid crystal display not blank.	M762/M767 Series	Visual	
n. Humidity indicator card missing (except M762/M767 Series).	All	Visual	Para X-6m
o. Polyethylene cushion missing.	All	Visual	
p. Cracked Head.	MK399 Mod 1	Visual	
q. Fuze not set on 'Delay'.	MK399 Mod 1	Visual	

3. Minor:			
a. Firing pin closing disc or foil missing or damaged.	Para X-6e	Visual	
b. Ogive loose (does not interfere with setting sleeve) or exhibits vertical movement.	M48 Series, M51 Series, M557	Visual/Manual	
c. Set line in improper position for shipping.	M513 Series, M514 Series, M728 Series, M732 Series	Visual	Para X-6k
d. Marking incorrect or illegible.	All	Visual	
e. Evidence of poor workmanship.	All	Visual	
f. Foil seal over lead charge damaged or missing.	M762 Series	Visual	

APPENDIX Y
CARTRIDGE, 120MM MORTAR

Y-1. Item Description.

a. DODACs and ammunition type:

(1) 1315-C379: Cartridge, 120mm, HE, XM934/M934/M934A1

(2) 1315-C623: Cartridge, 120mm, HE, XM933/M933

(3) 1315-C624: Cartridge, 120mm, WP XM929

(4) 1315-C625: Cartridge, 120mm, Illum, XM930.

(5) 1315-C788: Cartridge, 120mm, HE, M57 (NDI).

(6) 1315-C789: Cartridge, 120mm WP M68

(7) 1315-C790: Cartridge, 120mm, Illum, M91 (NDI)

(8) 1315-CA03: Cartridge, 120mm, WP, M929.

(9) .1315-CA04: Cartridge, 120mm, HE, M934A1/M934A2

(10) 1315-CA07: Cartridge, 120mm, Illum, IR, XM983 M983

(11) 1315-CA09: Cartridge, 120mm, Full Range, Practice, M931.

(12) 1315-CA39: Cartridge, 120mm, Illum, M930E1

(13) 1315-CA44: Cartridge, 120mm, HE, M933A1

NOTE

M57, M68, and M91 cartridges not authorized with carrier mounted M121 mortar due to overpressure safety concerns may cause bodily injury and hearing loss.

b. Early procurement of 120mm ammunition from foreign sources was designated M57 (C788) for high explosive or M91 (C790) for illuminating cartridges. A total of 57,000 HE, M57 and 9,000 Illum, M91 cartridges were purchased from foreign sources. This stock is frequently referred to as a non-developmental item (NDI). NDI cartridges have a unique propelling charge configuration. Fuzes for M57 HE cartridges are US manufactured M935 PD fuzes. The one lot of M91 illuminating cartridges is assembled with DM93 mechanical time fuzes. Cartridge model numbers have been changed for later production in the USA. Inspection criteria will apply to both foreign procurement and US production unless indicated otherwise.

c. 120mm cartridges are fin-stabilized rounds fired from smooth bore weapons. Weapons include M120 mortar for ground emplacement and M121 carrier mounted mortar. Information pertaining to weapons, authorized cartridges and firing procedures is contained in TM 9-1015-250-10. A complete round (except NDI) consists of a Projectile, Fuze, M31 Fin Assembly, M981 or M1020 Ignition Cartridge and four M230 or M234 Propelling Charges. For a complete description of these rounds see TM 43-0001-028 and TM 9-1300-251-20&P/34&P.

d. Sub Caliber Device, M303 is an 81mm, M29 Series mortar tube with an adapter. This device, when inserted into the 120mm tube permits firing of 81mm M300 Series and M880 Short Range (Practice) ammunition. Ammunition fired from this subcaliber device will be inspected using Appendix G for 81mm mortar ammunition. Information pertaining to weapon authorized cartridges and firing procedures is contained in TM 9-1015-254-13&P.

e. Drawings for 120mm mortar cartridges are proprietary and authorized only limited distribution. Any request submitted to Commander, Rock Island Arsenal, ATTN: SIORI-ITD, (DSN 793-6973) as required by paragraph 2-2b must include adequate justification of need for drawings.

f. Packaging of NDI cartridges is 1 round per fiber container, 2 fiber containers per wooden box. Later US production is packed 1 cartridge per, PA 153 fiber container or PA167 polyam container, 2 containers per metal can, PA 154.

g. Palletization of M900 Series cartridges will be in accordance with drawing 19-48-4116, Appendix 38A.

Y-2. Unique Safety Precautions.

No unique safety precautions are applicable to this item.

Y-3. Testing And Equipment Requirements.

a. Gaging policy is provided in Chapter 2 of this SB. Gaging is not normally required during PI, RI, or UBLI. Gaging, during these inspections (other than IRI), should be limited to individual rounds having visual evidence of damage or other conditions that may preclude loading and firing. Unless the rounds requiring gaging are truly representative of the lot being inspected, they should be disregarded in evaluating the lot.

b. A gage for 120mm ammunition is not available at this time. AMC Project Manager for Mortars is working to develop/procure a profile and alignment gage for 120mm cartridges.

Y-4. Inspection Category And Sampling Plan.

a. Inspection categories:

(1) Category W: 5 years - Practice without Explosive Components (Inert) and Illuminating.

(2) Category X: 4 years - HE, WP, RP, Practice with Explosive Components, Chemical, FS Smoke, Leaflet and Riot Control

(3) Inspection interval is to be reduced to 2 years for cartridge lots assigned condition code C due to discolored propellant or foam from packing supports adhering to propellant containers.

b. The sampling plan to be used for inspection is found in Chapter 2.

Y-5. Specific Inspection Points.

a. Items will be inspected and defects classified according to Table Y-1.

b. Drawings require packaging of all 120mm, M929 WP cartridges in fiber inner containers (PA153) and metal outer containers (PA154) to be marked "this end up." This is to permit identification of correct orientation when palletized and in storage. Requirement is to store and transport WP cartridges in a nose up configuration. When packaged or unitized in other orientations and subjected to high temperatures (111+ degrees F) filler may melt, change position (hence center of gravity), and upon solidification cause poor ballistics with resultant short rounds.

Table Y-1. Item Defects And Method Of Inspection

Classification	Application	Inspection Method	Inspection Description
1. Critical:			
a. Fuze not set on safe.	M91	Visual	
b. Fuze safety wire missing, insecure, or improperly engaged.	M57/M91	Visual/Manual	
c. Ignition cartridge head not below flush with rear edge of fin.	All	Straightedge	Para Y-6a
d. Firing plug protrudes above primer head.	All	Straightedge	
e. Any propellant increment missing or damaged (cut or torn with leaking propellant)	M57/M91	Visual	
f. Propellant increments not in correct sequence	M57/M91	Visual	Para Y-6b
g. Any propellant charge container missing or damaged (broken or cover delaminated with leaking propellant).	M900 Series	Visual	Para Y-6d
h. Propellant charge support assembly missing or improperly positioned.	Para Y-6k	Visual	Para Y-6k
i. Fin assembly damaged, distorted, or cracked.	All	Visual	
j. Obturating ring missing or broken.	All	Visual	
k. WP leakage or evidence of leakage.	M929	Visual	
l. One or more shear pins missing.	M91	Visual	
m. Crack in projectile.	All HE/WP	Visual	Para Y-6c
n. Explosive residue on projectile exterior.	All HE	Visual	
2. Major:			
a. Ignition cartridge missing	All	Visual	
b. Any propellant increment damaged where propellant cannot escape.	M57/91	Visual	
c. Propellant charge container damage where propellant cannot escape.	M900 Series	Visual	Para Y-6d
d. Any component damaged or incorrectly assembled (if not described elsewhere).	All	Visual	Para Y-6e
e. Fuze assembly not fully seated.	All	Visual	
f. Fuze adapter not fully seated.	All	Visual	
g. Fin assembly loose or not fully seated.	All	Visual/Manual	Para Y-6f
h. Obturating ring not welded/bonded.	All	Visual	Para Y-6g
i. Obturating ring not flush or below bourrelet diameter.	All	Straightedge/ gage	Para Y-6h
j. Obturating ring damaged (other than broken	All	Visual	
k. Cartridge fails to freely enter profile and alignment gage.	All	Gage	Para Y-6i
l. Glue, asphalt, wax, or cement on cartridge (bourrelet area only).	All	Visual/Gage	Para Y-6h
m. Arrow and/or "this end up" marking missing from inner/outer pack or ctg incorrectly oriented in pack.	M929	Visual	
n. Fuze not set on "PD".	All with M935 Fuze	Visual	
o. Fuze support missing from PA153 container.	M900 Series	Visual	
p. Fuze label missing or illegible.	M57	Visual	
q. Propellant charge support assembly missing or improperly positioned.	Para Y-6l	Visual	Para Y-6l
r. Fin corroded with blockage of the flash holes.	All	Visual	
3. Minor:			
a. Paint missing in an area greater than 0.25 square inch.	All	Visual	
b. Fuze not set in the "PROX" mode.	All with M734 Fuzes	Visual	
c. Propellant container discoloration	M900 Series	Visual	Para Y-6j
d. Fin corroded with flaking but not blocking flash holes.	All	Visual	Para Y-6j
4. Incidental:			
a. Propellant container discoloration.	All	Visual	Para Y-6j
b. Fin corrosion with no flaking.	All	Visual	Para Y-6j

Y-6. Inspection Description and Notes.

a. Primer is contained in M981 ignition cartridge. Ignition cartridge should be fully assembled and in contact with fin rear boss.

b. Propellants sequence for NDI cartridges starting from front of cartridge must be 4 each white increments, followed by 2 blue increments with 1 brown increment at rear.

c. Projectile body (HE or WP) with open or closed crack (cold shut) is a safety hazard during firing.

d. Rigid propellant charge containers have a water resistant finish to protect propellant from moisture contamination. Cracks, dents, seam, or propellant fill hole cover delamination or other damage would be classified as a major defect. If damage is severe enough to permit propellant to escape, the defect is critical. To check integrity of damaged propellant containers place the charge on an M31 fin, oriented such that the propellant would be resting against the damaged surface and hand shake vigorously three times.

e. When the component is damaged to the extent that its functional effectiveness is impaired significantly, it will be classified as a defect.

f. When the fin assembly can be turned upon application of hand pressure, it will be classified as a defect.

g. NDI M57/M91 Cartridges have obturators heat welded. M900 Series cartridge obturator ends are glued together with adhesive.

h. Gage with a profile and alignment gage only if visually questionable.

i. Normally done only during first inspection and documented on DSR card to preclude repeat gaging. See paragraph Y-3a.

j. Discoloration of propellant charge containers is a result of high humidity and temperature in storage. Color change is from normal light yellow to dark yellow to light green progressing to darker shades of green. Splotches of discoloration rather than a uniform transition of entire charge container evidences change. Corrosion on fin areas adjacent to propellant containers is normally associated with this discoloration. If this corrosion does not extend to other portions of fin, there is no flaking and flash holes are not obstructed, this condition is to be classified as incidental. Corrosion accompanied by flaking but no blockage of the flash holes is a minor defect. Corrosion with blockage of the flash holes is a major defect. Cartridges with discolored propellant charge containers or with foam from packing supports adhering to propellant containers is to be assigned condition code C, priority of issue.

k. All 120mm mortar cartridges with propellant charge support assemblies found during the following inspections:

(1) Initial receipt inspections (IRIs).

(2) Periodic inspections (PIs) without evidence of previously being field returns.

l. All 120mm mortar cartridges with propellant charge support assemblies found during (field return) receipt inspections (RIs).

APPENDIX Z
CARTRIDGES, 25MM

Z-1. Item Description.

a. FSC: 1305.

b. Ammunition Type: Cartridge, 25mm. Includes the following models:

(1) Armor Piercing Discarding Sabot-Tracer (APDS-T), M791.

(2) High Explosive Incendiary-Tracer (HEI-T), M792 with fuze point-detonating self-destroying M758.

(3) Target Practice-Tracer (TP-T), M793.

(4) Dummy, M794.

(5) Target Practice Discarding Sabot-Tracer (TPDS-T), M910.

(6) Armor Piercing Fin Stabilized Discarding Sabot-Tracer (APFSDS-T), M919.

Z-2. Unique Safety Precautions.

a. Ammunition malfunctions will be reported IAW AR 75-1.

b. Cartridge, 25mm, M919, APFSDS-T utilizes a depleted uranium (DU) penetrator that emits very low levels of radiation. Care must be taken when handling this round to limit direct contact with the DU penetrator.

c. Evidence of depleted uranium corrosion is visible in the form of a yellowish or white powder or stain seen on the outer surface of the projectile and is a hazard to personnel. If corroded (Yellow or White Corrosion) APFSDS-T M919 ammunition is encountered, ammunition must be handled with gloves. The ammunition must be placed in the original pack, tagged unserviceable, and returned through normal supply channels. Avoid getting depleted uranium corrosion on hands, wash hands with water before eating or putting hands to face. Dispose of gloves IAW AR-385-10.

d. When handling M919, 25mm, APFSDS-T Cartridges with exposed DU penetrators (i.e. cartridges missing aluminum sabots or plastic nose caps) always wear gloves regardless if corrosion is present or not. Even though gloves are worn, always wash hands before eating or touching face. Gloves need not be disposed of or treated as radioactive waste.

e. Swipe test is not required on cartridge, 25mm, M919, APFSDS-T ammunition unless there is evidence of corrosion or damage.

f. Exposure to 25mm APFSDS-T ammunition results in exposure to low-level radiation. The amount of radiation received is proportional to the time spent in close vicinity of APFSDS-T M919 ammunition. Although the radiation exposure received is low, avoid unnecessary contact with packaged APFSDS-T M919 ammunition (within mission constraints).

g. Loss or unauthorized firing of M919 rounds must be reported through the chain of command as soon as discovered. All transmissions regarding incidents of this nature must be marked, 'For Official Use Only (FOUO)'. HQ, JMC must be notified within 24 hours of discovery. Report to addressee in paragraph 1-5.d.(18)(b).

Z-3. Testing and Equipment Requirements.

Profile and alignment gaging is not authorized at this time. See paragraph Z-7 for M28 link gaging criteria.

Z-4. Inspection Category and Sampling Plan.

a. Inspection category: Category W (five years).

b. Sampling plan for 25mm ammunition will be IAW basic portions of SB 742-1, Table 2-3, for column heading Item (Other).

NOTE

Inner pack and item samples must be selected from a minimum of ten outer packs. Additional outer packs must be inspected at either the inspection or storage location(s) to make a total sample size of twenty.

Z-5. Specific Inspection Points.

Refer to MIL-STD-644, MIL-STD-129, and DWG 8796522 for marking of wood boxes, DWG 12982865 for other than wood boxes, DWG AC00561 for palletized load marking procedures, and basic portion of SB 742-1 for inspection of packaging and marking. DWGS can be ordered from addressee in paragraph 1-5.d.(5).

Z-6. Additional Guidance for 25mm Ammunition.

a. Cartridges, 25mm M791, M910 and M919:

(1) Missing or cracked plastic nose caps do not affect the ballistic performance of these cartridges and do not pose any risk to the weapon. Rounds found with missing plastic nose caps must have the exposed aluminum windscreen visually inspected for dents or damage.

(2) Damaged windscreen will be classified as a major defect.

(3) When defective windscreen samples are noted in sufficient quantities to cause rejection of a serviceable lot, linked belt will not be separated from the serviceable lot, and lot will be reclassified and reported through command channels to the commodity command.

b. Conglomerate lots of 25mm ammunition:

(1) Individual lot quantities of 25mm ammunition of less than a standard exterior pack will be accumulated for conglomeration and reported to the commodity command. The commodity command will notify JMC storage activities and overseas commands of items authorized for conglomeration. Automatic

disposal of 25mm ammunition is not authorized.

(2) 25mm ammunition will be maintained in stock by individual lot number regardless of lot size.

(3) Quantities will be accumulated and carried on record as usable assets under the appropriate condition code. 25mm ammunition will be reported on DA Form 2415 Ammunition Condition Report (ACR) according to DA PAM 750-8 for disposition instructions.

(4) If authorized, relinking will be IAW basic portions of SB 742-1.

(5) Conglomerate lots will be inspected for serviceability at the same interval as other category W items i.e., five years. Sample size will also be the same.

(6) Packed lots will be identified by DODIC and nomenclature furnished by HQ, JMC.

c. 25mm with lost lot identity:

(1) Firing of 25mm with lost lot identity is prohibited.

(2) All 25mm with lost lot identity (Lot UNKNOWN) will be picked up to accountable records in condition code K pending inspection and classification.

d. Ammunition determined by inspection to be serviceable and lot number identified will be assigned appropriate condition code. Ammunition determined by inspection to be unserviceable and lot number identified will be assigned appropriate condition code and reported through command channels to the commodity command.

e. Repack of 25mm ammunition:

(1) CONUS posts, camps or stations without adequate personnel and facilities to perform inspection and processing of 25mm ammunition will report through command channels to HQ, JMC IAW DA PAM 750-8 for disposition.

(2) Serviceability criteria:

(a) Ammunition will meet the visual inspection criteria specified in basic portions of this SB and the additional criteria in Table Z-1.

(b) Restricted or suspended ammunition will not be used in repack operations without specific authorization or instructions from the commodity command. Lot formation criteria. 25mm ammunition lots will be formed IAW basic portions of SB 742-1.

(c) Field returns of loose 25mm rounds with lot number not identifiable will be reclassified unserviceable and reported to the commodity command for disposition. Records and reports. DSR's and accountable records will be maintained IAW basic portions of SB 742-1.

f. Dummy 25mm ammunition:

(1) Inspect dummy cartridges for such defects as damaged extractor groove/rim, damage that may preclude use, corrosion, and loose projectiles.

(2) Dummy cartridges with defects other than those specified above will be considered serviceable as long as their intended purpose is unimpaired and they can be identified as dummy.

g. Air testing 25mm containers:

(1) Air testing of M621 and PA125 containers is not required during cyclic inspections.

(2) Air testing of containers is usually performed during maintenance operations only. HQ, JMC will provide instructions for testing in SOW of DMWR or LOI.

Z-7. Link Gaging Requirements.

a. A standard gage has not been developed to measure for correct positioning of link on cartridge. Engineering elements have approved and made available drawings from which a gage may be locally fabricated.

b. Drawings should be requisitioned from the office in paragraph 1-5.d.(20)(h). Drawing number assigned for the gage is XM283910087.

c. Cartridges not fully seated in metallic link belts are not cause for immediate rejection of the linked cartridge belt. If a reasonable attempt to correctly reposition the cartridge in its link fails (see Table Z-2 requirements), the linked cartridge belt should then be rejected.

d. Incidental dents on the cartridge case shoulder are not a cause for rejection. This condition does not affect serviceability of ammunition.

e. Check for compliance with drawing 12013695, Characteristics, Linked Belt, 25mm, M28, using locally fabricated 25mm gage and criteria in Table Z-2 below.

Z-8. Inspection of Linked Belts.

a. The M28 link is a two piece assembly intended to hold and link the 25mm ammunition for guiding the ammunition through the weapon system. The assembly consists of hardened steel main and pivot links hooked together and contoured accordingly for its intended purpose.

b. Links for Cartridges, 25mm, M791, M792, M793, M910, and M919 shall be inspected to assure free hinging. Linked 25mm ammunition shall hinge freely and fold over smoothly without binding, kinking, separating or any interference when belt is pulled over itself. Each belt shall be laid out full length with open side of links up. One end shall be drawn over remainder of belt until belt is completely reversed (open side of link down). One end of reversed belt shall then be drawn over remainder of belt until belt is returned to original (open side of link up) position. Belt must hinge freely throughout this process. Failure to hinge freely will be classified as a major defect.

Table Z-1. Ammunition Serviceability Criteria.					
	M791 APDS-T	M792 HEI-T	M793 TP-T	M910 TPDS-T	M919 APFSDS-T
1. Cartridge Case:					
Perforated or corroded primer.	Major	Major	Major	Major	Major
2. Projectile Assembly:					
a. Cracked, gouged or missing sabot segment.	Major			Major	Major
b. Windscreen bent, cracked, or missing.	Major			Major	Major
c. Loose M758 Fuze.		Major			
d. Loose penetrator.					Major
e. Corroded penetrator if cap missing.					Major
f. Missing or split obturator.					Major
g. Damaged Obturator.					Minor
h. Nose cap missing or split.	Accept			Accept	Accept

Table Z-2. Link Gaging Requirements.		
Examination	Method of Inspection	Defect Classification
1. Height from bottom of cartridge to forward tab of M28 link.	Vernier calipers/gage	Major
2. Dimple not engaged in cartridge case groove, two (2) places.	Visual	Major

APPENDIX AA
GRENADE, LAUNCHER/DISCHARGER, 66MM

AA-1. Item Description.

a. FSC: 1330

FZ14	FZ15	FZ16	FZ17
G815	G826	G978	GG03

b. Ammunition Type: Grenade, Launcher, Smoke: Screening, RP, (UK) L8A1 & L8A3; Grenade, Launcher, Smoke, IR Screening, M76; Grenade, Launcher, Smoke, Simulant Screening, M82; Grenade, Launcher, Smoke Screening, TA, M90; Grenade, Discharger, Anti-Riot, Irritant, CS, L96A1; Grenade, Discharger, Anti-Riot, Practice, L97A1; Grenade, Launcher, Non-Lethal, Distraction, M98; Grenade, Launcher, Non-Lethal, Blunt Trauma, M99.

c. The L8A1, L8A3, M76, and M82 are used with the four tube launchers (M6, M243, M257 or M259) or the six tube launchers (M239 or M250) mounted on armored/tactical vehicles. The L96A1, L97A1, M90, M98 and M99 grenades are primarily delivered from vehicles equipped with the light vehicle obscuration smoke system (LVOSS).

d. Grenade, Launcher, Smoke: Screening, RP, (UK) L8A1 & L8A3 (G815). These grenades are used to provide a self-screening smoke capability for armored/tactical vehicles. The grenade consists of a rubber cylindrical body and a metal base. The rubber body contains 360 grams of red phosphorous/butyl rubber in a 95/5 proportion and a central plastic burster tube containing a burster charge of 15 grams of black powder. The metal base contains the electrical clips, F92 squib type electric fuze, propellant charge of 3.0 grams black powder; and the delay assembly with delay composition (0.26 grams black powder, L8A1; 0.36 grams black powder, L8A3). The metal base contains eight gas propulsion holes covered by a metal foil diaphragm.

e. Grenade, Launcher, Smoke: IR Screening, M76 (G826). This grenade is used to provide an infrared and visual smoke screening capability for armored/tactical vehicles. The grenade consists of a plastic cylindrical body that contains 1200 grams of IR composition (brass flake material), a central burster containing 31 grams of Comp A-5 with a booster of 0.47 grams of Comp CH-6, a safe and arm (S&A) mechanism, and a propellant assembly. The S&A mechanism consists of an out-of-line spring loaded slider/bore rider containing an explosive lead with 0.07 grams of PBXN5 and a spring loaded setback lock. The propellant assembly contains a propellant charge of 1.2 grams of black powder, a pyrotechnic delay detonator, and a propellant retainer which has the electrical contacts and the electric match. The delay detonator contains 0.06 grams of A-1A powder, 0.3 grams of delay composition, 0.09 grams of lead azide, and 0.04 grams of RDX.

f. Grenade, Launcher, Smoke: Simulant Screening, M82 (G978). This grenade is used to provide visual screening capability for armored/tactical vehicles during training exercises. This grenade has the same components as the M76 grenade except its payload contains titanium dioxide instead of IR.

g. Grenade, Launcher, Smoke: TA, M90 (GG03). The M90 grenade is used with the M7 and similar 66mm launchers to generate a cloud of white smoke. The grenade body is a cylinder of thin metal. It is filled with three stacked canisters with a burning smoke mixture of Terephthalic Acid. The empty cylindrical grenade body remains in the launcher after the black powder expulsion charge has launched the 3 canisters approximately 35 meters from the launcher.

h. Grenade, Discharger, Anti-Riot, Irritant, CS, L96A1 (FZ14). The 66mm non-Lethal, anti-riot irritant grenade is intended to be used as a distraction device in order to stop, confuse, disorient, and/or temporarily incapacitate. The L96A1 can be used to provide standoff delivery of irritants from a mobile platform for riot/crowd control and protection of convoys in peacekeeping operations. The L96A1 is comprised of a 66mm glass filled nylon propulsion base and a cylindrical rubber body containing the payload. The propulsion base contains a black powder propellant charge, an electric match (fuze) and a black powder delay. The rubber body payload contains 23 individually fuzed, light alloy canister submunitions filled with tear gas, a CS compound. Each submunition contains a central perforation and is surrounded with cambric cloth (cloth impregnated with gun powder). The cambric cloth is ignited by a piece of igniter cord that is assembled through the central perforation in each submunition and joined to the initiation charge at the base of the grenade. The L96A1 uses the gas produced by the rapid burning of the igniter cord/cambric to burst the rubber body that contains the 23 submunitions. The submunition will burn for approximately 8 seconds, producing a cloud of CS irritating smoke.

i. Grenade, Discharger, Anti-Riot, Practice, L97A1 (FZ15). The 66mm non-Lethal, anti-riot practice grenade is intended to be used for training purposes. The L97A1 deploys cinnamic acid (CA) smoke to simulate the CS (tear gas) of the L96A1. The L97A1 is comprised of a 66mm glass filled nylon propulsion base and a cylindrical rubber body containing the payload. The propulsion base contains a black powder propellant charge, an electric match (fuze) and a black powder delay. The rubber body payload contains 23 individually fuzed, light alloy canister submunitions filled with CA smoke. Each submunition contains a central perforation and is surrounded with cambric cloth (cloth impregnated with gun powder). The cambric cloth is ignited by a piece of igniter cord that is assembled through the central perforation in each submunition and joined to the initiation charge at the base of the grenade. The L97A1 uses the gas produced by the rapid burning of the igniter cord/cambric to burst the rubber body that contains the 23 submunitions. The submunition will burn for approximately 8 seconds, producing a cloud of cinnamic acid smoke.

j. Grenade, Launcher, Non-Lethal, Distraction, M98 (FZ16). The M98 is a non-lethal 66mm grenade that contains 3 distraction payload canisters. When each canister reaches its target area, its bursters ignites a pyrotechnic charge. The ignition of the charges delivers a blinding flash and loud sound that disorients crowds. Loading the grenade into the launcher tube initiates the following sequence of steps: In the launcher tube, the electric match ignites the

black powder that propels each of the 3 submunitions from the grenade body and ignites the quick match of each of the 3 submunitions. 4.5 to 5.0 seconds later (in the target area), an audio/visual effect (M98) is delivered on the target. This interval starts with the ignition of the burster mix, the rupturing of the burster tubes and the ignition of the payload surrounding the burster tubes generating the applicable effect (of sound and of blinding light).

k. Grenade, Launcher, Non-Lethal, Blunt Trauma, M99 (FZ17). The M99 is a non-lethal 66mm grenade that contains 3 distraction payload canisters. When each canister reaches its target area, its bursters ignites expelling approximately 140 .32 caliber PVC balls. The physical impact of these balls will be traumatic, confusing and disorienting the crowds. Loading the grenade into the launcher tube initiates the following sequence of steps: In the launcher tube, the electric match ignites the black powder that propels each of the 3 submunitions from the grenade body and ignites the quick match of each of the 3 submunitions. 4.5 to 5.0 seconds later (in the target area), a blunt trauma effect (from the M99 PVC balls) is delivered on the target. This interval starts with the ignition of the burster mix, the rupturing of the burster tubes and the ignition of the payload surrounding the burster tubes generating the applicable effect (of PVC balls).

AA-2. Unique Safety Precautions.

a. If the M76 smoke grenade is armed (bore riding pin projecting from the body, red showing on slider), DO NOT attempt to remove grenade from container. Under no circumstances should attempts be made to return the slider to a safe position by hand. Replace packing, close cover, and notify EOD personnel for disposal.

b. Red phosphorous grenades produce smoke which may present an inhalation and irritant hazard. Prolonged exposure of the eyes and respiratory system should be avoided. Personnel shall wear protective masks to avoid excessive exposure when exposed to an RP smoke concentration.

c. A phosphine gas atmosphere is generated from the smoke mix in L8A1 and L8A3 grenades. As a result, the following safety handling guidance is to be observed.

(1) Store all L8A1 & L8A3 grenades in a ventilated area or magazine.

(2) Storage magazines containing these grenades shall be opened and allowed to ventilate three to five minutes prior to entry by personnel.

(3) These grenades shall only be unpacked out of doors or in a well ventilated area.

(4) Do not open storage containers in the vicinity of open flame or flame producing devices.

d. Prior to removing 66mm grenades from their pack, examine for presence of exposed propellant and/or explosive contents.

e. Avoid initiation of the M98 and M99 grenade by electromagnetic radiation (EMR) by ensuring that EMR sources like radars, radios, cell phones and SINCGARS are at sufficient distance (e.g. 50 meters) from the unpacked grenades.

f. Any riot control agent may present an inhalation hazard. Prolonged exposure of the eyes and respiratory system should be avoided. Wear protective masks to avoid excessive exposure when loose or airborne riot control agent is present.

AA-3. Inspection Category and Sampling Plan.

a. Inspection category Z; Periodic Inspection Interval – 2 years.

b. Sampling plan and accept/reject criteria for inspection is IAW SB 742-1.

AA-4. Specific Inspection Points.

Item will be inspected and classified IAW Chapter 2 and Table AA-1

AA-5. Inspection Description.

a. A black or green buildup of material can occur around firing clips on the L8A1 and L8A3 grenades. This substance is not leaking filler but a type of galvanic corrosion resulting from chemical reaction between copper rivets holding electrical contacts and phosphine gas generated from the main filling (red phosphorous). This external corrosion does not normally affect performance. The firing clips on the grenade connect with a knurled pin contact assembly in the grenade launcher where the knurling will make electrical contact through the corrosion. If the corrosion is to the extent that metal integrity is questionable, classify as a major defect. If not, corrosion will be considered incidental.

b. Corrosion/rust on the electrical connection that may interfere/prevent proper initiation of the grenade will be classified as a major defect. If it will not, classify as incidental.

c. Check the adequacy of the crimping of the grenade body and end plate. The presence of an improper, poor, or no crimp between the two will be classified as a major defect.

d. If the M98 or M99 grenade body (excluding the propulsion base assembly) is distorted or dented, classify as a critical defect -- the payload canister could become stuck/jammed in the launcher upon initiation. Dents to the propulsion base assembly will be classified as determined by the visual inspection.

AA-6. References:

a. TM 9-1330-200-12

b. TM 9-1330-209-14

c. TM 9-1330-200-34

d. TM 43-0001-29

Table AA-1 Defect and Method of Inspection.			
Classification	Model/Application	Inspection Method	Inspection Description
1. Critical:			
a. Grenade armed, slider/bore-rider extended, showing red.	M76, M82	Visual	
b. Markings misleading as to type of grenade.	All Models	Visual	
c. Grenades show signs of filler leakage.	All	Visual	Para AA-5a (L8A1/A3)
d. Evidence of damage and/or loose parts in the grenade.	M98, M99	Visual/Manual	Para AA-5d
2. Major:			
a. Metal base punctured.	L8A1/A3	Visual	
b. Punctured round without leaking filler.	All	Visual	
c. Rubber body torn or dry rotted.	L8A1/A3, L96A1, L97A1	Visual	
d. Plastic body cracked or damaged.	M76, M82	Visual	
e. Bore seal damaged or missing.	M76, M82	Visual	
f. Electrical contacts missing or corroded to the extent that metal is affected.	All Models	Visual	Para AA-5b
g. Metal foil covering gas propulsion holes missing or punctured.	L8A1/A3	Visual	
h. Grenade distortion preventing insertion into launcher (discharger).	L8A1/A3, L96A1, L97A1, M76, M82, M90,	Visual	
i. Markings illegible	All Models	Visual	
j. Any observable dent to the grenade body or loose end cap.	M90	Visual	
k. Missing swage crimp on grenade body DWG 13-19-802 (M90), DWG 13-19-762 (M98), DWG 12-19-722 (M99).	M90, M98, M99	Visual	
l. Improper/poor/no crimp	M98, M99	Visual	Para AA-5c
m. Rust or corrosion to the extent that it cannot be used as intended.	All	Visual	
n. Evidence of liquid and/or wetness in the unit pack assembly.	M98, M99	Visual	
3. Minor:			
a. Markings incomplete or illegible (other than grenade type and/or lot number).	All	Visual	
b. Minor rust/corrosion.	All	Visual	
c. Paint defects (e.g., rust scale, peeling, blistering, etc.).	L8A1/A3, L96A1, L97A1, M90, M98, M99	Visual	
d. Inadequate paint coverage.	L8A1/A3, L96A1, L97A1, M90, M98, M99	Visual	

APPENDIX AB
DEFECT CODES

Defect codes are listed in DA PAM 700-19, they are utilized to identify and clarify the serviceability of materiel. For conventional ammunition they are inputted to the Worldwide Ammunition Reporting System (WARS) and for Toxic Chemical Munitions (TCM) they are inputted to the Chemical Accountability Management Information Network (CAMIN). Defect codes are composed of six alpha/numeric characters: First character is the percent defective indicator; the second and third characters identify the type of assembly; fourth character indicates the classification of defect; and the fifth and sixth characters are the defect narrative. Indicators for each defect code element are listed below.

PERCENT DEFECTIVE

INDICATOR	PERCENT
0	0
1	1-14
2	15-24
3	25-34
4	35-44
5	45-54
6	55-64
7	65-74
8	75-84
9	85-94
C	95-100

ASSEMBLY/COMPONENT/PACKAGING

INDICATOR	NARRATIVE
01	Assembly (complete round or item of issue)
02	Fuze (nose fuze if item has two fuzes)
03	Booster
04	Bomblets
05	Warheads
06	Body, filled or empty (for projectile grenade, mine, rocket, etc.)
07	Filler (inert, explosive, pyrotechnic compound, non-lethal Chemical agent
08	Rotating Band
09	Cartridge case or cartridge case with liner
10	Fuze well liners
11	Propellant (bag, increment, train, etc.)
12	Gasket
13	Primer (artillery, small arms, ignition, etc.)
14	Fittings (tubes, pipes, valves, detents, etc.)
15	Initiator (ignition, igniter assembly, ignition cartridge)
16	Charge (supplementary, expelling)
17	Tracer
18	Motor (rocket)
19	Stabilizer or fin (bomb, rocket, grenade, artillery)
20	Firing device
21	Canister (smoke, illuminating, shot)
22	Parachute or parachute assembly
23	Burster or burster assembly
24	Adapter or adapter booster
25	Safety device (pin, block, lever, shorting clip, etc.)
26	Closure (closing plug, lifting plug, nozzle closure, base plate, etc.)
27	Link, belt, clip
28	Bandoleer
29	Hardware (screw, nut, bolt, pin, gasket, etc.)
30	Skid or pallet
31	Inner packing
32	Outer packing
33	Banding
34	Burster well
35	Detonator
36	Delay elements
37	Desiccant
38	Relative humidity indicator cards
39	Electrical connector (cables, plugs, wiring)
40	Launcher
41	Dispenser
42	Lead wire seals
43	Felt pads
44	Gas check gasket
45	Lug/suspension
46	Wind shield
47	Grommet
48	Base/tail fuze
49	Propelling charge container
50	Desiccant holder
51	Obturator band
52	Lethal chemical agent

CLASSIFICATION

1	Critical
2	Major
3	Minor
4	Incidental
5	Suspended–suitable for emergency combat
6	Suspended–from issue and use (SIU)
7	Suspended–from issue, movement and use (SIMU)
8	Restricted
9	Special remarks – maintenance

DEFECTS/SPECIAL REMARKS

INDICATOR	NARRATIVE
AA	Missing
AB	Loose
AC	Wrong model
AD	Wrong type
AE	Wrong lot number
AF	Mixed lots
AG	Mixed models
AH	Mixed ammunition types
AJ	Leaking (excluding TCM)
AK	Exuding
AL	Agent contamination (excluding TCM)
AM	Armed
AN	Foreign matter
AP	Corrosion (verdigris)
AQ	Deterioration
AR	Weathered (packing)
AS	Dry rot (packing)
AT	Blue bag with loss of tensile strength (propellant)
AU	Blue bag without loss of tensile strength (propellant)
AV	Authorized for demilitarization
AW	Dented
AX	Gouged
AY	Scratched
AZ	Split or cracked
BA	Cut or torn
BB	Inadequate torque
BC	Inadequate stake, crimp or weld
BD	Excessive torque
BE	Excessive tightness
BF	Missing (packing)
BG	Incorrect type (packing)
BH	Damaged (packing)
BJ	Insecure (packing)
BK	Incorrect size (packing)
BL	Zone weight punch marks defective
BM	Failed air pressure test
BN	Failed ring gaging
BP	Minimum retainable lot size
CA	Rust preventative compound missing
CB	Rust preventative compound ineffective
CC	Rust preventative lubricant missing
CD	Rust preventative lubricant ineffective
CE	Paint peeling
CF	Paint missing
CG	Paint chipped
CH	Inadequate paint coverage
CJ	Protective coating missing
CK	Sealing compound missing
CL	Sealing compound ineffective
CM	Rust
CN	Greater than 30 percent RH
CP	Greater than 40 percent RH
CQ	Greater than 50 percent RH
CR	Excessive moisture
CS	Caked igniters (black powder only)
CT	Oxidation
CU	Bent
CV	Excess paint coverage
CW	Requires notched banding
CX	Base gas check seal improper
CY	Base fuze hole plug improper
DA	Requires replacement
DB	Requires radiographic inspection
DC	Requires gaging
DD	Requires inspection for critical defect
DE	Pending malfunction investigation (class code 4, 5, or 6)
DF	Resource recovery indication (for TCM to be used at the direction of the Designated Disposition Authority)
DG	Requires ultrasonic inspection
DH	Past due inspection by six months

DJ	Requires replacement of unserviceable components
DK	Requires special inspection
DL	Requires replacement of desiccant and humidity indicator
DM	Requires 100 percent inspection or segregation
DN	Requires eddy current test
DO	Requires dye penetrant test
DP	Requires magnetic particle test
DQ	Requires chemical test (excluding TCM)
DR	Requires mechanical test
DS	Requires electrical test
DY	Requires inspection for other than critical defects
DU	Requires PII for fleet issue
DV	Requires torque test
DW	Component missing
DX	Component incorrect type
DY	Component damaged
DZ	Component insecure
EA	Failed chemical test (excluding TCM)
EB	Failed mechanical test
EC	Failed electrical test
ED	Failed functional test
EE	Failed environmental test
EF	Failed non-destructive test
EG	Failed radiographic inspection
EH	Failed ultrasonic test
EJ	Failed eddy current test
EK	Failed dye penetrant test
EL	Failed magnetic particle test
EM	Functional code downgrade
EN	Quantity of tracers in lot too small for trace test
EP	Misfire
EQ	Cannibalized
ER	Salt water damaged
ES	Damaged threads
ET	Unitized/palletized load not acceptable for shipment, handling, storage and transfer at sea
EU	Broken
EV	Waterproof protective cover missing or damaged
EW	Pallet adapters missing (Navy pack)
EX	Incorrect pallets for Navy issue
EZ	Hazardous, unserviceable, non-repairable (for TCM to be used at the direction of the Designated Disposition Authority)
FA	Marking missing
FB	Marking illegible
FC	Marking incorrect
FD	Marking misleading
FE	Label missing
FF	Label damaged
FG	Label incorrect
FH	Color coding incorrect
FJ	Extraneous markings
FK	Thermal coating missing
FL	Thermal coating soft
FM	Packed for local use
FN	Held for grand lotting
FO	Contains restricted/suspended components
FP	Contains serviceable components
FQ	Damaged in shipment
FR	Barrier bags not sealed
FS	Wet pack
FT	Base tracer hole plug improper
FV	Identified with ammunition identification code (AIC)
FW	Ammunition not palletized/unitized
FX	Ammunition improperly palletized
FZ	Non-hazardous, unserviceable, non-repairable (for TCM to be used at the direction of the Designated Disposition Authority)
HA	Overpacked leaking toxic chemical munition
HB	Multiple overpacks due to leaking overpack
HC	Toxic chemical munition leaker lot
HD	Non-leaking M23 Mine, packed with leaking M23 Mine in original drum
HE	Toxic chemical agent filler restricted due to decrease in agent casualty ratio
HF	Toxic chemical munition that has been drilled to obtain agent sample
HG	Toxic chemical munition that has been overpacked for reasons other than leaking

HH	Toxic chemical munition overpacked with explosive component(s)
HO	CFO metal parts
PB	Propellant Stability Cat B
PC	Propellant Stability Cat C
PD	Propellant Stability Cat D
SA	Lot less than minimum size for overseas shipment
SB	Pending evaluation from NICP
SC	ASRP Test Samples – Centralized Trace Test, Small Caliber Stockpile Reliability Program, Centralized Controlled Function Test Program, Large Caliber Test Program, Stockpile Propellant Program, Propellant Stability Program, Propellant Reassessment Program, Mater Sample Program, Deterioration Check Test Program
SD	Assigned priority of issue
SE	Directed by TB 9-1300-385 (class codes 4, 5, 6 or 7)
SF	Non-standard pack
SG	Accepted on waiver
SH	Less than one standard exterior package
SJ	Pending ballistic test results
SK	Limited to in country issue (due to level of packaging)
SL	Limited issue; CC-E is due to marking, packaging or material discrepancies not affecting functional reliability, safety or transportability. Items require normal maintenance for long term storage but are suitable for issue and use for training purposes.
SM	Shelf life will expire in one year or less
SN	Shelf life expired
SP	50 to 69 percent specification trace test (SAA)
SQ	50 percent of better satisfactory trace test (SAA)
SR	49 percent or less satisfactory trace test (SAA)
SS	Salvaged or used components or material
ST	Directed by higher HQ/command other than malfunction (not published in TB 9-1300-385)
SU	Pending reassessment
SV	Pending propellant analysis
SW	Held in environmental storage
SX	Storage configuration prevents inspection of item
SY	Restricted from overhead fire
SZ	Pending deterioration check test
TA	Service life expired
TB	Explosive contamination
TC	Assembly incorrect
TD	Obsolete (for TCM to be used at the direction of the Designated Disposition Authority)
TE	Overhaul cycle exceeded
TF	Direct by T.O. 11A-1-1 (Air Force)
TG	Directed by TWO 024-AA-ORD-010 (Navy)
TH	Directed by NAVSEA/NAVAIR
TJ	Directed by Air Force
TK	Directed by Marine Corps
TL	Previously stored in Southwest Asia
TM	Overdue for inspection by twice the interval
TN	Requires Magnaflux testing
WW	Pending inspection (found during wall to wall inventory)
XX	Designated a “waste munition” by the Designated Disposition Authority. Only to be used at the direction of the Designated Disposition Authority.
ZX	Cannot be found in storage
ZY	Not inspected by QASAS
ZZ	No meaning assigned; used to fill space (not authorized unless directed by JMC Surveillance Office).

APPENDIX AC
STANDARD (NEW) AMMUNITION DEFECT CODES

This Standard Ammunition Defect Code listing includes all codes and their standard definitions. No changes, additions or deletions to these codes are authorized except as approved by the JOCG Quality Assurance Subgroup for publication herein. These standard codes are provided for use by the individual Military Services. Army requirements are provided in Supply Bulletin (SB) 742-1, "Ammunition Surveillance Procedures," Appendix AE. Navy and Marine Corps requirements are provided in Naval Supply Systems Command (NAVSUP) Publication P-805, "Navy and Marine Corps Conventional Ammunition Sentencing," Appendix D.

AMMUNITION DEFECT CODE.

Defect codes are six digit, alphanumeric codes that complement and/or supplement Condition Codes by identifying specific reasons for Condition Code assignment and/or identifying specific defects or conditions.

STRUCTURE.

Defect codes are six-digit, alphanumeric codes. A defect code is made up of 6 alpha (letter) or numeric (number) characters in 4 component parts as follows: 1 23 4 56.

STATUS CODE. COMPONENT PART 1:

The first part is the "Status" Code. Status codes are single, alphanumeric character codes which complement condition codes by identifying the action required to determine the true condition or to change the current condition when the Condition Code alone does not provide this identification. Army and Air Force activities may use this position to indicate a percent defective based on inspection.

COMPONENT CODE. COMPONENT PART 23:

The second part is the "Component" Code. Component Codes are double, alpha-character codes. Component Codes supplement Condition Codes by identifying the subassembly, component or part (including packaging) of an item which is defective or which is the subject of a "Defect/Special Remark" Code.

CLASSIFICATION CODE. COMPONENT PART 4:

The third part is the "Classification" Code. Classification Codes are single, alpha-character or single, numeric character codes. Classification Codes complement Condition Codes by identifying the nature of qualifications on serviceability, including suspensions, restrictions or limitations on storage, movement, issue or use.

DEFECT/SPECIAL REMARK CODE. COMPONENT PART 56:

The fourth part is the "Defect/Special Remark" Code. Defect/Special Remark Codes may be either double, numeric-character or double, numeric-alpha-character codes. Defect/Special Remark Codes supplement Condition Codes by identifying specific defects or other factors (special remarks) applicable to the material condition or status.

STATUS CODE DESCRIPTION:

0	Zero percent defective	(Army and Air Force)
1	1 - 14% defective	(Army and Air Force)
2	15 - 24% defective	(Army and Air Force)
3	25 - 34% defective	(Army and Air Force)
4	35 - 44% defective	(Army and Air Force)
5	45 - 54% defective	(Army and Air Force)
6	55 - 64% defective	(Army and Air Force)
7	65 - 74% defective	(Army and Air Force)
8	75 - 84% defective	(Army and Air Force)
9	85 - 94% defective	(Army and Air Force)
A	Warranty in Effect. Used when specific defects (identified by Defect/Special Remark Code) are covered by warranty.	
B	For/Pending Quality Evaluation/Surveillance. Used to identify QE/surveillance samples/items.	
C	95 - 100% Defective (Army and Air Force).	
D	For/Pending Acceptance. Used for assets not previously accepted.	
E	For/Pending Certification/Recertification/Post Renovation Test. Used for assets previously accepted.	
F	For/Pending Engineering Investigation. Airborne Weapons Corrective Action Program (AWCAP) investigation or other malfunction analysis.	
G	Pending Authorization for Demilitarization or Reclamation. Used for non-repairable assets when test, inspection, maintenance or repair instructions do not provide specific condemnation or reclamation provisions for local activity determination.	
H	For/Pending Demilitarization/Reclamation.	
I	(Not used)	
J	Pending Screening for Known/Suspected Defects, or Segregation or Other Visual Inspection to Determine True Condition.	
K	Pending Receipt Inspection.	
L	Quality Deficiency Report (QDR) Exhibit/Report of Discrepancy (ROD).	
M	Pending Disposition.	
N	Requires Palletization, Repalletization, Unit Loading or Correction of Related Discrepancies Prior to Shipment/Issue.	
O	(Not used)	
P	Pending Sorting Due to Known Mixed Condition, Lots, Models, or Types. Used when any unacceptable mixture requires separation, regardless of Condition Code(s) assigned.	
Q	(Not assigned)	
R	Requires Correction of Unacceptable Packaging (Including Marking) to provide environmental protection prior to long term storage or shipment.	
S	(Not assigned)	
T	Shippable/Shootable.	
U	(Not assigned)	
V	Requires Item Maintenance; i.e., derust, repaint, remark, etc.	
W	Requires Replacement of Components.	
X	Obsolete.	
Y	(Not assigned)	

Z No Status Code applies.

COMPONENT CODE DESCRIPTION:

AA Assembly/Complete Round/All-Up-Round (AUR).
AD Adapter or Adapter Assembly.
AN Anchor.
AP Auto Pilot Battery Unit (APBU).
AT Actuator.
BB Barrier Bag.
BC Ball Cartridge (Small Arms Ammunition).
BD Bandoleer.
BF Base/Tail Fuze.
BL Barcode Label.
BM Bomblets/Submunitions/Grenades.
BN Banding.
BP Baseplate.
BR Booster, Rocket.
BS Booster, Fuze.
BT Battery, Thermal Battery.
BU Burster or Burster Assembly.
BW Burster Well.
BY Body, Filled or Empty (for Projectile, Grenade, Mine, Rocket, etc.).
CC Cartridge Case or Cartridge Case with Liner.
CH Charge (Supplementary, Expelling).
CL Closure (Closing Plug, Base Fuze Hole Plug, Tracer Hole Plug, Lifting Plug, Nozzle Closure, Base Plate, etc.).
CM Chemical/Chemical Agent/Chemical Munition.
CN Canister.
CO Control Section.
CP Clip.
CR Cradle.
CS Canister (Smoke, Illuminating, Shot).
CV Cover (Protective/Access Cover, Cap, Lid, etc.)
DC Dust Cover.
DE Delay Element(s).
DH Desiccant Holder.
DO Document Holder.
DP Dispenser.
DS Desiccant.
DT Detonator.
EC Electrical Connector.
EL Electrical Cable (Cables, Plugs and Wiring).
EM EMR (Electromagnetic Radiation) Shield.
EP Eye Shield Assembly (Stinger).
ES Environmental Seal.
EX Exercise Head.
FD Firing Device.
FL Filler (Inert, Explosive, Pyrotechnic Compound, Non-Lethal Chemical Agent).
FP Felt Pads.
FN Fin or Stabilizer (Bomb, Rocket, Grenade, Artillery).
FT Fitting (Tube, Pipe, Valve, Detent, Handle, Latch, etc.).
FU Fuel Tank.
FW Fuze Well/Fuze Well Liner.
FZ Fuze (Nose Fuze if item has two fuzes).
GC Guidance and Control Section.
GD Guidance Section.
GG Gas Check Gasket/Gas-Check-Seal (GCS).
GK Gasket/O-ring.
GN Grounding Device.
GP Grip Stock.
GR Grommet.
HB Handling Band/Strap.
HN Handle Carry.
HP High Pressure Container.
HS Hero Safe Shield, EMI (Electromagnetic Interference).
HW Hardware (Screw, Nut, Bolt, Pin, etc.).
IG Initiator (Ignition, Igniter Assembly, Ignition Cartridge Arming Device, Safe and Arming Device, Torpedo Exploder).
JW Jungle Wrap.
KT Kit.
LB Label, Identification Tag.
LG Lug/Suspension.
LH Latch.
LK Link, Belt.
LL Launch Lug/Fitting.
LP Lifting Plug.
LR Launcher.
LY Lanyard (Cable, Arming Wire).
MK Marking, Stenciling, Color-Code.
NZ Nozzle.
OB Obturator Band.
OG Ogive.
OW Observation Window.
PA Paint/Coating/Protective Finish.
PC Parachute or Parachute Assembly.
PI Packing/Package (Inner), Dunnage, Filler, etc.
PJ Projectile.
PN Penetrator.
PO Packing/Package (Outer), Container, Cradle, etc.
PP Propellant (Bag, Increment, Train, etc.).
PR Primer (Artillery, Small Arms, Ignition, etc.).
PS Pins Stacking.
PT Pallet, Pallet Adapter, Skid or Palletization.
PV Pressure Release Valve.
QR Quick Release Pins (Locking Pins).
RB Rotating Band.
RC Records, Logbook, Data Card, etc.
RD Radome.
RH Relative Humidity Indicator.
RL Rail.
RM Rocket Motor.
SA Safety Device (Pin, Block, Lever, Shorting Clip, etc.).
SB Sabot.
SC Spike Cap.
SE Sealant, Sealing Compound, Adhesive, etc.
SI Shock Indicator.
SK Skid.

SL Seal (Lead-Wire Seal, Securing Wire, Traceable Seal, etc.).
SM Shock Mount.
SP Shorting Plug.
SQ Squib.
SR Seeker.
TB Launch Tube.
TC Tracer/Tracer Cartridge.
TD Target Detecting Device (TDD).
TH Thermal Coating.
TL Tail Section/Torpedo Afterbody.
TM Telemetry.
TN Torpedo Nose Assembly.
TR Transducer.
UC Umbilical Cover.
WH Warhead(s).
WF Wings, Control Surfaces, or Wings and Fins (Set).
WS Wind Shield.
ZW Zone Weight Marking/Punchmarks.
ZZ Subassembly/Component/Part Not Otherwise Identified.

CLASSIFICATION CODE DESCRIPTION:

0 Critical defect/defective.
1 Major defect/defective.
2 Minor defect/defective.
3 Incidental defect/defective.
4 Suspended - suitable for emergency combat.
5 Suspended - from issue and use - SIU.
6 Suspended - from issue, movement and use - SIMU.
7 Classification directed by other service – NAVSUP P 801 (Navy) or CMRS (Air Force).
8 Directed by NICP, not included in TB 9-1300-385.
9 Directed by response to maintenance ACR IAW DA PAM 750-8.
A Classification directed by TB 9-1300-385 (Army), NAVSUP P 801 (Navy) or CMRS (Air Force).
B For training use only. (See Note 1)
C Priority issue for service use. (See Note 1)
D Priority issue for training use. (See Note 1)
E Restricted or limited issue. Not used when a restriction or limitation on use applies. (See Note 1)
F Restricted or limited use (except training, non-standard test or overhead fire). (See Note 1)
G Non-standard configuration, for non-standard test or training use only. (Not used with standard configuration items.) (See Note 1)
H Not cleared for overhead fire. (See Note 2)
I (Not used)
J Limited remaining shelf-life/service life. Used when remaining life is a Condition Code determinant.
Z No classification code applies.

NOTES:

(1) Used when classification is directed by authority other than TB 9-1300-385 (Army), NAVSUP P 801 (Navy) or CMRS (Air Force).

(2) Used when restriction is specified in appendices to NAVSUP P 801 (Navy) or TB 9-1300-385 (Army).

DEFECT/SPECIAL REMARK CODE DESCRIPTIONS:

NOTE: The first character identifies the general type of defect or Special remark as follows:

0- Safety defects or unsafe conditions.
1- In-service defects or conditions.
2- Environmental/exposure defects or conditions.
3- Test defects.
4- Inspection defects (other than visual).
5- Assembly defects.
6- Physical damage.
7- Processing deficiencies.
8- Special remarks.
9- Toxic chemical munitions.

WARNING

THE FOLLOWING CODES FOR SAFETY DEFECTS OR UNSAFE CONDITIONS APPLY WHEN DEFECTS OR CONDITIONS EXIST WHICH CONSTITUTE HAZARDS TO PERSONNEL, FACILITIES OR EQUIPMENT DURING HANDLING, STORAGE, PROCESSING OR TRANSPORTATION, AND WHICH REQUIRE SPECIAL HANDLING, TREATMENT AND/OR ATTENTION.

00 UNSAFE - Lethal fluid, substance or agent leak/ contamination.
01 UNSAFE - Unstable (explosive, propellant, chemical).
02 UNSAFE - Combustible (non-lethal) fluid or substance leak.
03 UNSAFE - Cracked/ruptured explosive/ propellant case.
04 UNSAFE - Explosive exudate/residue/ contamination.
05 UNSAFE - Armed.
06 UNSAFE - Safety fitting/fixture/accessory missing/damaged.
07 UNSAFE - Dropped (exceeding safe drop limits).
08 UNSAFE - Misfire/hangfire.
09 UNSAFE - Toxic (non-lethal, non-combustible) fluid/substance leak/contamination.
0A UNSAFE - Unstable/insecure unit load.
0X UNSAFE - Other/unidentified safety defect/ unsafe condition.

IN-SERVICE DEFECTS OR CONDITIONS. CODE DESCRIPTION:

10 Captive flown.
11 Ready Service.
12 In-water run.
13 Hermetic seal broken.
14 Extraneous markings.
15 Expended; retained for maintenance, reclamation or disposal.
16 CAD/PAD removed from aircraft. Remaining installed life will not meet maintenance cycle requirements.

17 Catapult launches and arrested landings (CATS/TRAPS)
1X Other/unidentified in-service defect or condition.

ENVIRONMENTAL/EXPOSURE DEFECTS OR CONDITIONS. CODE DESCRIPTION:

20 Expired (shelf-life, service life, MDD, etc.).
21 Requires replacement of desiccant and humidity indicator.
22 Wet/excessive moisture (rain/condensation).
23 Oxidation (rust), corrosion or verdigris.
24 Salt-water wet-down or salt spray exposure, or salt water damage.
25 Deteriorated, weathered.
26 Shelf life to expire in 1 year or less.
27 Exuding/hydrogen gas buildup.
28 Marking Illegible.
29 Marking faded.
2A Service life expired.
2B Shelf life expired.
2C Greater than 30 percent RH.
2D Greater than 40 percent RH.
2E Greater than 50 percent RH.
2F Wet pack.
2G Blue bag with loss of tensile strength.
2H Blue bag without loss of tensile strength.
2J Delaminated Glue/Bonding Failure.
2N Caked igniters (black powder only).
2P Dry rot (packing).
2Q Overhaul cycle exceeded.
2R ISPM-15 non-compliant.
2X Other/unidentified environmental/exposure defect or condition.

TEST DEFECTS. CODE DESCRIPTION:

30 Failed torque test.
31 Failed air pressure test.
32 Failed hydraulic test.
33 Failed electronic/electrical test.
34 Failed systems test.
35 Failed Test-In-Test (BIT).
36 Failed life/stockpile reliability/ surveillance function test.
37 Failed mechanical test.
38 Failed chemical test.
39 Failed non-destructive test/examination (NDT/NDE) (radiographic, ultrasonic, magnetic particle, eddy current, magnaflux, and dye-penetrant).
3A Failed environmental test.
3B Functional code downgrade.
3C Propellant stability Cat C.
3D Propellant stability Cat D.
3F Failed radiographic inspection.
3G Failed ultrasonic test.
3H Failed eddy current test.
3J Failed dye penetrant test.
3K Failed magnetic particle test.
3L Failed magnaflux testing.
3M Quantity of tracers in lot too small for trace test.
3X Other/unidentified test defect.
3N 50 to 69 % specification trace test (SAA).
3P 50 % or better specification trace test (SAA).
3Q 49 % or less specification trace test (SAA).

INSPECTION DEFECTS (other than visual). CODE DESCRIPTION:

40 Failed gaging.
41 Failed dimensional measurement.
42 Incomplete test, gaging or other inspection of a sample to verify serviceable condition.
43 Overdue inspection.
44 Not inspected by QASAS.
45 Pending inspection (found during wall to wall inventory).
46 Non-hazardous, unserviceable, non-repairable (for TCM to be used at the direction of the DDA).
4X Other/unidentified inspection defect (other than visual).

ASSEMBLY DEFECTS. CODE DESCRIPTION:

50 Missing.
51 Incorrect/unauthorized configuration.
52 Incorrect (item, component, part, material or marking).
53 Missing, incorrect, defective stake or crimp.
54 Missing/defective weld.
55 Loose, insecure, inadequate torque.
56 Excessive tightness, overtorqued, stuck.
57 Gear adrift/loose material.
58 Incorrect model.
59 Incorrect type.
5A Incorrect lot.
5B Incorrect color code.
5C Incorrect assembly/orientation.
5D Excessive paint coverage.
5E Explosive contamination/residue.
5F Missing, incorrect, misleading, illegible and extraneous markings.
5G Component (not identified in component codes) missing, i.e., inner packing components such as hardware, cushioning, filler, end cap of fiber container.
5H Incorrect fuze setting.
5J Label missing, incorrect or damaged.
5K Mixed lots, models, or ammunition types.
5L Limited issue. CC-E is due to marking, packaging, or material discrepancies not affecting functional reliability, safety, or transportability. Items require normal maintenance for long-term storage but are suitable for issue and use for training.
5M Cannibalized.
5N Zone weight punch marks defective.
5P Component damaged.
5R Air launch configuration.
5S Surface launch configuration.
5X Other/unidentified assembly defect.

PHYSICAL DAMAGE. CODE DESCRIPTION:

60 Structural damage (punctured, dented, broken, bent, split, cracked, worn, torn, cut, thread damage, etc.).
61 Surface damage (gouged, scratched, or paint/protective coating peeling, chipped, etc.).
62 Broken/cracked weld.
63 Barrier bags or hermetically sealed containers open.
64 Leaking filler material (non-lethal, non-combustible, non-toxic).
65 Foreign material, dirty, etc.
66 Dented.
67 Cracked, split, cut or torn.
68 Bent.
69 Damaged threads.
6A Broken.
6B Component (not identified in component codes) damaged, i.e., inner packing components such as hardware, cushioning, filler, end cap of fiber container.
6C Bent or missing pins.
6D Thermal coating missing/soft.
6X Other/unidentified physical damage or replacement of unserviceable components.

PROCESSING DEFICIENCIES. CODE DESCRIPTION:

70 Pending test or sample test (other than NDE or other inspection) for characteristic(s) that may be nonconforming. Other conditions unknown or unserviceable.
71 Pending gaging for characteristic(s) that may be nonconforming. Other conditions unknown or unserviceable.
72 Pending NDE (radiographic, ultrasonic, magnetic particle, eddy current, magnaflux, dye-penetrant) for characteristic(s) that may be nonconforming. Other conditions unknown or unserviceable.
73 Processing incomplete (other than test, gaging or NDE).
74 Pending test, sample test, gaging or NDE (radiographic, ultrasonic, magnetic particle, eddy current, magnaflux, dye-penetrant) to verify serviceable condition.
75 No fix authorized.
76 Requires PII for fleet issue.
77 Requires special inspection.
78 Requires 100 percent inspection or segregation.
79 Requires torque test.
7A Pending ballistic test results.
7B Pending evaluation from NICP.

SPECIAL REMARKS. CODE DESCRIPTION:

80 Non-standard pack (acceptable for shipment/issue). Limited to in country issue.
81 Non-standard pack (acceptable for local storage/movement only).
82 Not unitized/unitized.
83 Unserviceable outer package/container, contents serviceable. Authorized for local movement and temporary storage only. Not acceptable for shipment, issue, or long term storage of contents.
84 Resource recovery indicated.
85 Directed by CMRS (Air Force).
86 Directed by NAVSUP-P-805 (Navy).
87 Directed by NAVSEA/NAVAIR.
88 Directed by Air Force.
89 Directed by Marine Corps.
8A Previously stored in SWA.
8B Overdue for inspection by twice the interval.
8C Minimum retainable lot size.
8D Identified with Ammo Indent Code (AIC).
8E Lot less than minimum size for overseas shipment.
8F Assigned priority of issue.
8G Directed by TB 9-1300-385 (class codes 4, 5, 6 or 7).
8H Salvaged or used components or material.
8J Accepted on waiver.
8K Directed by Higher HQ/Command other than malfunction (not published in TB 9-1300-385).
8L Storage configuration prevents inspection of item.
8M Obsolete.
8N Restricted from overhead fire.
8P Held in environmental storage.
8Q Authorized for demilitarization.
8R Contains restricted/suspended components.
8S Contains serviceable components.
8T Deteriorated while in or as a result of conditions in storage.
8W Designated a "waste munition" by the DDA. Only to be used at the direction of the DDA.

TOXIC CHEMICAL MUNITIONS. CODE DESCRIPTION:

90 Leaking toxic (lethal) chemical munition (containerized).
91 Leaking toxic (lethal) chemical munition packaged in multiple overpack(s) due to primary container failure.
92 Toxic (lethal) chemical munition containerized for reasons other than leaking (precautionary).
93 Toxic (lethal) chemical munition "leaker lot".
94 Non-leaking M23 Mine(s), packaged in original drum with leaking mine(s).
95 Declared a solid waste by an Authorized Military Official (AMO or CMA) DDA.
96 Toxic (lethal) chemical munition drilled, sampled and plugged in conjunction with Stockpile Reliability Program testing.
97 Leaking or non-leaking toxic (lethal) chemical munition, containerized with accessible explosive components.
98 Leaking or non-leaking toxic (lethal) chemical munition, containerized without accessible explosive components (removed prior to packaging).

NO DEFECT/SPECIAL REMARK CODE APPLIES.
CODE DESCRIPTION:

ZZ No Defect/Special Remark Code applies.
ZA Deteriorated while in or as a result of conditions in Appendix AE Rocket M55 GB SMI Procedure

APPENDIX AD
AMMUNITION CARTRIDGE, 75MM, BLANK M337 SERIES

AD-1. Item Description.

a. DODIC: 1315-C025.

b. Ammunition Type: Cartridge, 75mm, Blank, M337 Series.

AD-2. Unique Safety Precautions.

No unique safety precautions are applicable to this item.

AD-3. Testing and Equipment Requirements.

a. All IRI samples will be gaged using a profile and alignment gage. Gaging is not normally required during RI, PI or UBLI.

b. Gaging during these inspections (other than IRI) should be limited to individual rounds showing evidence of damage or other conditions that may preclude loading or firing. Unless the rounds requiring gaging are truly representative of the lot being inspected, they should not be used to evaluate the lot. Results, however, should be annotated on the DSR with the reason for gaging.

c. Table AD-1 identifies test and measurement equipment.

AD-4. Inspection Category and Sampling Plan.

a. Inspection category: category W (five years), blank ammunition.

b. The sampling plan for inspection is according to Chapter 2.

AD-5. Specific Inspection Points.

Item will be inspected IAW Chapter 2 and Table AD-2.

AD-6. Inspection Description and Notes.

a. See drawing 7549273. Primer parts must not protrude beyond rear face of cartridge case.

b. See drawing 7549273. Assure seal and air escape hole are completely filled with resin cement. Any excess cement should be removed from exterior of cartridge case.

c. Cracks or splits in cartridge case may expose black powder filler to moisture that could cause accelerated degradation of performance.

d. Gaging is required only during IRI or if visual inspection is questionable.

e. See drawing 7549273. Wax emulsion is required for aluminum cartridge cases.

Table AD-1. Equipment Identification List.

Description	NSN	Application	Inspection
Gage, profile and alignment	5220-00-651-0104	Cartridge, M337A2	IRI, RI, PI, UBLI
Gage, profile and alignment	5220-00-234-3343	Cartridge (brass case), M337A1	IRI, RI, PI, UBLI

Table AD-2. Item Defects and Method of Inspection.

Classification	Application	Inspection Method	Inspection Description
1. Critical:			
Primer above flush.	All	Visual/Straight Edge	Para AD-6a
2. Major:			
a. Primer loose.	All	Visual/Manual	
b. Closing cup cracked, broken, punctured or malformed.	All	Visual	Para AD-6b
c. Closing cup seal not continuous or groove not filled with cement.	All	Visual	
d. Closing cup air escape hole not filled with cement.	All	Visual	Para AD-6c
e. Cartridge case crack or split extending through sidewall or bottom.	All	Visual	Para AD-6d
f. Chamber gage failure.	All	Gage	
3. Minor:			
a. Glue or asphalt on exterior of cartridge.	All	Visual	
b. Missing protective finish.	M337A2	Visual	Para AD-6e

APPENDIX AE
ROCKET M55 GB SPECIAL SURVEILLANCE INSTRUCTION FOR STORAGE MONITORING INSPECTION PROCEDURES

AE-1. Item Description.

a. FSC 1340.

b. Ammunition Type: Rocket M55, GB.

AE-2. Purpose, Applicability, Proponent.

a. Purpose: The purpose of this Special Surveillance Instruction (SSI) is to provide procedures required to implement a Storage Monitoring Inspection (SMI) program for M55 GB rockets as directed in Chapter 7 of SB 742-1. These procedures are limited to those necessary to efficiently perform SMI of M55 GB Rockets.

b. Applicability: This SSI applies to all agencies, depots, arsenals, and activities responsible for storing M55 GB rockets. The procedures and technical requirements in this SSI are mandatory and will be incorporated in local standing operating procedures (SOPs), either directly or by reference to this SSI. Surety, safety, security, and related technical requirements are provided in other DoD publications unless specifically noted in this SSI.

c. Proponent: The proponent for this procedure is HQ, CMA. Deviations or exceptions to these inspection procedures will be requested formally. Individual users are encouraged to report errors, omissions, and recommendations for improving these instructions. Reports should be submitted by memorandum and forwarded to U.S. Army Chemical Materials Agency, ATTN: AMSCM-OPS, 5183 Blackhawk Road, Aberdeen Proving Ground, MD 21010-5424.

AE-3. References.

AR 11-34 Army Respiratory Protection Program.

AR 50-6 Chemical Surety.

AR 385-10 The Army Safety Program.

AR 700-68 Storage and Handling of Compressed Gases and Gas Cylinders.

AR 702-12 Quality Assurance Specialist (Ammunition Surveillance).

AMC-R 350-4 Training and Certification Program for Personnel working in Ammunition Operations.

DA PAM 40-8 Occupational Health Guidelines for the Evaluation and Control of Occupational Exposure to Nerve Agents GA, GB, GD, and VX.

DA PAM 385-61 Toxic Chemical Agent Safety Standards.

SB 742-1 Inspection of Supplies and Equipment, Ammunition Surveillance Procedures.

CMA Programmatic Laboratory and Monitoring Quality Assurance Plan (LMQAP).

AE-4. Definitions.

a. Compound Gate (Agent Gate): The window, in seconds, around the retention time of the compound of interest.

b. Leaking Munition: Munitions from which there has been a confirmed detection of chemical agent outside the munition body. (AR 50-6)

c. Leaker Isolation: For the purpose of this document leaker isolation is the isolation of a leaking rocket from a group of rockets with a single sample port open. Any other leaker isolation, draping stacks, pallets or rounds falls outside the scope of this procedure.

d. Quality Process (QP) Sample: A QP sample is a sample that has been spiked with a dilute solution of agent and exposed to ambient air for the same time and at the same flow rate as ordinary samples. For this procedure the dilute solution contains 0.5ng of GB. The ambient air is shipping and firing tube air.

e. Near Real Time (NRT) Low-Level Monitor (within the context of this document only): An automatic air monitoring system that can detect 0.5 ng of chemical agent GB within fifteen (15) minutes.

AE-5. Safety and Environmental Guidelines.

a. Guidance provided in this SSI does not supersede requirements of the RCRA or state environmental statutes. Installations must assure compliance with all current Environmental Protection Agency (EPA) regulations and state guidelines pertaining to these munitions, and incorporate such information in local policy or SOPs, where appropriate.

b. All SMI operations will be performed in a manner that minimizes the potential for agent release to the environment and affords maximum safety to operators and the general population. Implementing organizations will ensure SMI's are conducted in accordance with safety and health guidelines contained herein and in listed references.

c. Monitoring of ambient air inside chemical storage magazines while performing inspections will be accomplished IAW chemical storage site's approved monitoring plan.

d. The wrench used for removing the front and aft end cap sampling port plugs must be fitted with a splash shield to reduce the possibility of operators being exposed to liquid agent.

e. As a minimum, operators performing intrusive monitoring will wear OSHA level C protective clothing with hood and apron. A hazard analysis will be performed to determine the level of protective clothing required for leaker isolation.

f. The sample line for initial intrusive monitoring of M55 rockets will not be used for exposure monitoring of personnel.

g. When conducting intrusive monitoring operations on designated Leaker Lots, an igloo filtration system must be operating unless a hazard analysis indicates otherwise.

AE-6. Training and Certification.

a. The sample collection, laboratory, and monitoring personnel involved in the collection, analysis and monitoring of chemical surety material shall be certified and trained as outlined in the LMQAP

and site specific training plan.

b. Inspection functions identified in this SSI must be accomplished by Department of the Army Civilian (DAC) Quality Assurance Specialist (Ammunition Surveillance) (QASAS) GS-1910 series (Career Program 20). Under the direction of a QASAS, properly trained (IAW AMC-R 350-4) and designated civilian technicians may supplement and assist the QASAS in the accomplishment of these functions.

AE-7. Documentation.

a. All inspections must be documented IAW SB 742-1, Chapter 11.

b. A photocopy of the analytical monitoring results for all confirmed leaking rockets will be maintained in the Ammunition Surveillance Office. The lot number(s) and sample number(s) will be annotated on the monitoring results.

c. Leaking rockets will be reported IAW SB 742-1, Chapter 7.

AE-8. Sample Selection.

a. Vapor test. Samples from each lot, will be tested for agent contamination inside the M441 SFT, see Table AE-1. Sampling Plan A will be used for lots that have not experienced leakers in their life cycle. Sampling Plan B will be used for lots that have experienced leakers, but have not been designated as leaker lots. Sampling Plan C will be used for those lots that have been designated as Leaker Lots at your location. Lots in Sampling Plan B that have not leaked in five or more years and contain a known stable GB agent lot may be considered for re-inclusion in Sample Plan A. Requests for re-inclusion will be forwarded to the proponent of this SSI for approval.

b. When performing leaker isolation of M55, GB rockets, any intrusive monitoring can be credited toward the current quarter's sampling requirements. If the lot has already been sampled for the current quarter, no credit can be taken. If a leaker is encountered during the intrusive monitoring, the remainder of the total sample size still must be completed for this lot.

Table AE-1. M55 GB Rocket Storage Monitoring Inspection Sampling Plans

Lot Size	Quarterly (unless otherwise indicated) Sample Size		
	A	B	C
0-25	8[1]	20[1]	100%
26-150	16[1]	44[1]	25[2]
151-300	6	16	40[2]
301-750	9	23	64
751-3000	12	30	75
>3000	15	35	85

[1]Quantity indicated is to be sampled over a period of three years. This sampling may be accomplished at one time within the three years or in increments as determined by the QASAS-in-charge.

[2]When total annual sample size exceeds the lot size, the lot will be sampled 100% each year. This 100% sampling may be accomplished at one time within the year or in increments as determined by the QASAS-in-charge.

[3]When a rocket lot(s), or portion of a lot(s), has been scheduled for demilitarization within a designated calendar quarter (three months), the lot(s), or portion of lot(s), may be excluded from sampling during that quarter. If demilitarization has not commenced during the scheduled quarter (or is not imminent), sampling shall resume in subsequent quarters. Further delays are not authorized unless justified in writing by the QASAS-in-charge, based upon changes in the demilitarization timeline. Sample sizes need not be increased in ensuing quarters to account for rockets that were not sampled in a quarter during which a lot was scheduled for demilitarization

AE-9. Inspection Operations.

a. Visually inspect all accessible M441 Shipping and Firing Tubes (SFT) in the structure for evidence of leakage and general condition. Inspect for stability of stacks, condition of pallets and any other condition that could affect suitability for continued safe storage pending demilitarization. Visual inspections should be performed only to the extent possible without re-warehousing.

b. Identify M55 rocket lot selected for sampling.

c. Identify individual rockets designated for testing. Rockets not previously tested should be sampled first. Those rockets that have been previously inspected should have been tagged as such.

d. Verify that sampling plug in the front end cap of the SFT is in the 12 o'clock position. If sampling plug is not in the proper position, rotate M441 SFT until correct orientation is obtained. If M441 SFT cannot be rotated, check the position of the aft end sampling plug. The sampling plug closest to the 12 o'clock position will be removed first.

CAUTION

In rare instances, the M441 SFT may develop internal pressure during storage. Potential release of pressure associated with presence of liquid agent may result in expulsion of agent from sampling port when plug is removed. Equal care should be taken when removing either end-sampling plug. Situations have been experienced in which agent under pressure sprayed from one end of the firing tube but not the other. Plug removal wrench must be fitted with a splash shield.

e. Remove sampling plugs from front and rear end cap's and examine for the presence of agent contamination. If contamination is suspected, test with M8 paper. Look inside of the sample port for

evidence of solidified or crystallized agent. If present, monitor from outside the sample port; do not insert sample probe.

f. If front or rear end cap plug cannot be removed, and no evidence of agent leakage is present, select a different sample.

NOTE

With time, M441 SFTs have a tendency to settle within the pallet that causes the end caps of the SFTs to become misaligned with the openings in the end boards of the pallets. It is permissible to remove the end boards from the pallet. It is not necessary to replace the end boards when the operation is completed.

g. In the event damaged sampling port threads are noted, a thread chaser may be used or a self-tapping screw will be installed as a replacement for the plug that was just removed. If either plug cannot be reinstalled the rocket must be containerized in an SRC and tagged as a non-leaking rocket, missing sample plugs.

AE-10. Sampling Operations

a. The monitoring program described in the following section is based upon the ability of the equipment to detect the presence of 0.5ng of GB in the collected air sample. A mass of 0.5ng of GB will be the action level for this program.

b. Gross level testing to prevent saturation of the low-level detector separation column is optional. Maintain a ¼ inch separation distance between the front-end sample port and the end of the sample line or probe. If agent vapor is detected during gross level testing begin leaker isolation.

c. A NRT low level monitor will be used for this inspection. The NRT will be loaded with a Class III method to determine the presence or absence of agent at the 0.5 ng level. General QA procedures will be per the LMQAP. Methods and monitors developed and certified per the CASARM QA Plan need not be recertified. The following specific QC requirements will be enforced.

(1) One QP in the beginning of operations and one QP at the end of operations; an additional QP after 5 hours of operation. The QP samples will be injected at the end of the heated sample line or at the instrument. The QP samples must be exposed to shipping and firing tube air for the same time and at the same flow rate as ordinary samples. Corrective action is required if the QP cannot be detected at or above the 3:1 noise ratio of the instrument.

(2) Check flow rate prior to start of operations at the distal end of the sample line.

d. The void volume of air in the sample line must be taken into account during operations. Additional sample collection time must be added for continuous flow monitors, approximately 1 minute depending on line length and flow rate.

e. Intrusive sampling will be conducted with a single line. The heat traced sample line used for intrusive monitoring of M55 rockets will be connected to no more than 100ft of unheated Teflon line between the probe and the heated sample line.

f. To minimize interferent response recommend the Compound Gate on monitoring equipment be set at 5 to 6 seconds.

g. Sample lines used with real time low-level monitoring equipment should be provided preventive maintenance by having lines cleaned or flushed with solvent at intervals to be determined by the Laboratory/Monitoring Office.

h. Rodent feces have been identified as an interferent in real time low-level monitors. Ensure all areas around rocket pallet(s) are cleaned of feces prior to using monitors. Proper industrial hygiene procedures will be observed.

i. If an unusual number of leakers are encountered during an operation, the Laboratory/ Monitoring Supervisor and QASAS-in-charge shall review the sampling process for anomalies (e.g., contaminated sample lines, cross contamination, interference, etc.). If agreed upon, new samples may be taken to ensure the monitoring process has not been compromised.

j. Sample lines that become contaminated will be decontaminated and monitored in accordance with approved local procedures.

k. When intrusively monitoring Leaker Lots the following precautions will be taken to minimize the potential for cross contamination of subsequent samples.

(1) All opened SFTs must be in horizontal alignment with one another.

(2) No more than five SFTs will be sampled at one time.

(3) No more than 15 SFTs will be open at one time. To the extent practicable and consistent with efficient operations, operators should minimize the amount of time that SFTs remain open. Sampling port plugs should be replaced as soon as possible after intrusively monitoring. Each series of five SFTs and plugs should not be removed from SFTs awaiting sampling until necessary.

(4) Each series of SFTs will be opened, commencing with samples located lowest in a pallet or stack staying within the lot.

l. Single line sampling:

(1) The sample line will be assembled and attached to the monitoring line as shown in Figure AE-1.

(2) Operator will insert sample line into sample port so that the Tygon® stopper is flush against the sample port of the SFT. The sample line will extend no more than ½ inch into the SFT.

(3) Hold the sample line in the SFT for 1/5 of the cycle time for the instrument, operator will provide a minimum of 32 seconds of sample time per rocket based on a 3 minute sample time.

(4) When monitoring less than 5 rockets operator(s) will still monitor each shipping and firing

tube for 1/5 of the cycle time of the instrument and igloo air for the remainder of the sample time.

m. Upon detecting chemical agent vapor, at or above the action level, (a mass of 0.5ng of GB) operators will begin Leaker Isolation procedures as follows:

(1) Reinstall all sample port plugs. Ensure rubber gasket is placed on sample plug and is serviceable.

NOTE

If the vapor concentrations saturate the monitoring instrument's separation column, place instrument in a standby status and begin isolation procedure using alternate monitoring equipment.

(2) Insure sample line is clear of agent vapor by allowing monitoring instrument to aspirate clean ambient air.

(3) After verifying magazine's ambient air is free of agent vapor, begin Leaker Isolation. If an alternate detection method is used when initiating the isolation process, it may be used for confirmation.

NOTE

Real time low-level monitors that are being used to monitor the workers exposure profile may be used to verify that magazine ambient air is clear.

(4) During the isolation process, operator(s) will ensure that each SFT is subjected to an independent monitoring cycle. Placement of the sample line and the decision to monitor for a complete cycle will be based on the initial reading. The sample will not be considered a negative until one (1) complete NRT low-level monitoring sample cycle has been run.

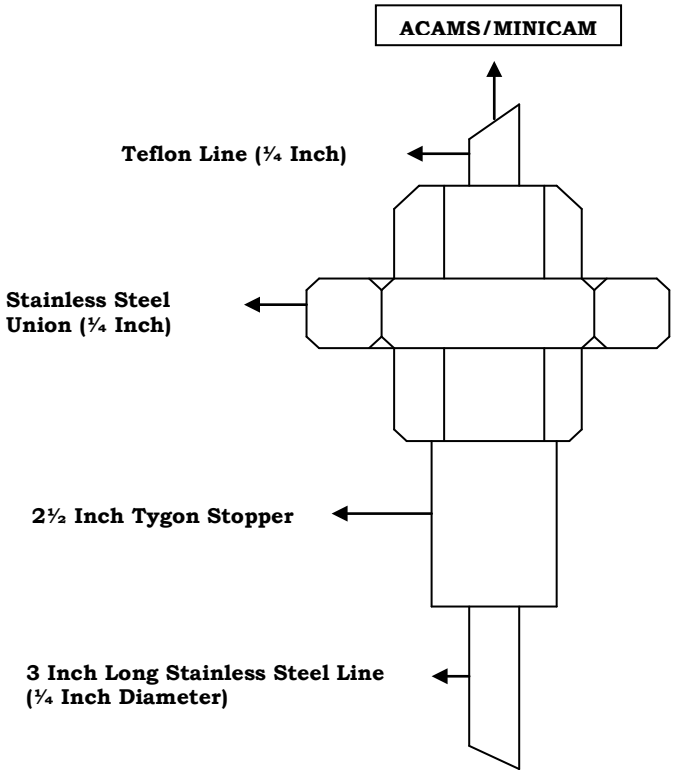
(5) If agent is detected on any one of the samples and leaker isolation is being performed using an alternate detection method, confirmation has been obtained. However, if leaker isolation is being conducted with the same detection method as used when agent was first detected an alternate detection method must be used for confirmation. The confirmation method/monitor must employ a different analytical method than the primary method.

(6) If using a continuous flow monitor and agent cannot be confirmed with an alternate method or no agent vapor is detected on last sampled rocket reinstall sample port plug with serviceable gasket and return item(s) to storage configuration and continue with SMI.

(7) When using a non-continuous monitor and agent cannot be confirmed with alternate method, or no agent vapor is detected on last sampled SFT, resample the previous set of SFT's sampled. If no agent vapor is detected on last sampled rocket reinstall sample port plug with serviceable gasket and return item(s) to storage configuration and continue with SMI.

(8) If agent is detected and then confirmed, containerize leaking rocket(s) in approved overpack container, apply required markings and place in approved storage location, IAW local procedures, and resume SMI. The decision to delay containerizing leakers will be based on ambient air contamination and the anticipated number of leakers in a structure. Movement of leakers to isolated storage may also be delayed to consolidate movements.

Figure AE-1
Stainless Steel Union placed at the end of the unheated sample line.



APPENDIX AF
FLARE, AIRCRAFT COUNTERMEASURE M206; DECOY, INFRARED, AIRCRAFT: COUNTERMEASURE, M211; FLARE, AIRCRAFT: COUNTERMEASURE, M212; CARTRIDGE, IMPULSE BBU-35/B; CARTRIDGE, IMPULSE M796

AF-1. Item Description.

a. NSN/DODIC:

(1) 1370-01-048-2138 L410 (M206 Flare);

(2) 1370-01-460-1684 LA14 (M211 Decoy);

(3) 1370-01-534-9804 LA14 (M211 Decoy Without Decal);

(4) 1370-01-460-1687 LA15 (M212 Flare);

(5) 1370-01-534-3060 LA15 (M212 Flare Without Decal);

(6) 1377-01-037-8651 MG62 (BBU-35/B Ctg);

(7) 1377-01-456-1933 MG62 (BBU-35/B Ctg);

(8) 1377-01-049-6365 MD73 (M796 Ctg).

b. Ammunition Type:

(1) Flare, Aircraft Countermeasure M206.

(2) Decoy, Infrared Countermeasure M211.

(3) Flare, Aircraft Countermeasure M212.

(4) Cartridge, Impulse BBU-35/B.

(5) Cartridge, Impulse M796.

c. Physical description:

(1) The M206 flare consists of a metal or plastic rectangular case 1 x 1 x 8 inches, containing an impulse cartridge receptacle with O-ring, a piston, felt spacer, flare pellet, and a plastic end-cap. The flare measures approximately 8" long with a 1" x 1" cross-section, and weighs approximately 0.43 pounds.

(2) The M211 decoy consists of an aluminum case which contains a receptacle (squib cup) for an impulse cartridge, a piston, a payload of stacked advanced material foil elements, which are pyrophoric (reacts with air), and an epoxied aluminum end-cap. The flare measures approximately 8" long with a 1" x 1" cross-section, and weighs approximately 0.66 pounds.

(3) The M212 flare consists of an aluminum case which contains a piston, a Safe and Initiation (S&I) device, a flare pellet grain assembly, and a brass end-cap. The flare measures approximately 8" long with a 1" x 1" cross section and weighs approximately 0.5 pounds.

(4) The BBU-35/B and M796 Impulse Cartridges consist of a cylindrical aluminum case 0.49-inch in body diameter, with a flange thickness of 0.060-inch and 0.625- inch in diameter. The cartridge case contains a firing electrode, glass-to- metal seal, bridge-wire, first-fire charge, booster charge, and a main-output charge contained by a closure disc held in place by a case end crimp. The M796 has both a disc closure and washer-closure.

d. Functional description:

(1) M206 flare requires an impulse cartridge (either MG62: Ctg, Impulse BBU-35/B or MD73: Ctg, Impulse M796) installed prior to functioning. The flare, with installed impulse cartridge, loads into a multiple flare dispenser magazine, which then installs into the aircraft. Flares dispense in flight when initiated by an electrical signal routed to the impulse cartridge. When the electro-explosive impulse cartridge fires and simultaneously ignites the first fire mix and forces the flare pellet to shear end-cap lugs and expel the payload (flare pellet) from flare case.

(2) The M211 Decoy's impulse cartridge receives a firing signal from the aircraft's on-board deployment system. Expanding hot gases from the impulse cartridge eject the highly air-reactive payload from the cartridge case into the air stream.

(3) The M212 Flare's impulse cartridge receives a firing signal from the aircraft's on-board deployment system. Expanding hot gases from the impulse cartridge simultaneously ignite the S&I device and expel the flare out of the case and into the slipstream. When the flare exits the case, the S&I device ignites the flare pellet.

(4) BBU-35/B and M796 Impulse Cartridges initiate electrically and generates flame gas pressure to ignite the flare and push flare ejection piston and payload out of flare case into aircraft slipstream.

AF-2. Unique Safety Precautions for M206 Flare.

a. Plastic M206s should not be used in the new ICMD AN/ALQ-212(V) dispenser. They will damage it. There is a chance of damage to older M130 magazines also due to non-ejection of flare grain (burns in case). The following lots of M206 flare were procured with plastic cases.

(1) BER lots w/interfix #001, 002, 003.

(2) LOW lots w/interfix #017, 019, 020.

(3) MBT lots w/interfix #004, 005, 006, 007, 008, 009.

b. Outgassing history: Test results confirm that temperature variations in storage can cause a build-up of hydrogen gas, subsequently resulting in bulging PA 19 metal cans. Uncontrolled relative humidity during the manufacturing and packaging process traps moisture in the magnesium composition that reacts with the magnesium causing a hydrogen gas release within 2 to 4 years and continues until all moisture is consumed.

c. Degassing procedures for PA19 cans:

(1) Gas release will be conducted in a well-ventilated area, free of flammables, explosives, fires, open flames and contaminants. Person(s) opening containers must wear face shield, flame-retardant clothing, conductive sole safety shoes or equivalent.

(2) Remove bulged cans from outer pack and place in a locally-designed holding fixture on a grounded surface. Caution will be taken to slowly release built-up gasses as serious injury to personnel could result. Container may open with considerable force due to gas pressure.

(3) The locally-designed holding fixture should be a wooden box or frame fabricated with an open front which will allow PA-19 container to be inserted with end handle accessible and a clearance between top of container and box from one to two inches. These types of fixtures will protection from cover flying open.

(4) Hold lower half of container body exerting a downward force, and with a non-sparking tool shaped in the form of a J, pull latch forward. Keep latch in constant contact with HASP if possible. A hissing sound may accompany release of gas. Verify that gas pressure has been released; then reseal container and remove from wooden box.

(5) Repack items.

AF-3. Inspection Category and Sampling Plan.

a. Inspection Categories:

(1) Flare – Cat Z: Periodic inspection interval - 2 years.

(2) Impulse Ctg – Cat W: Periodic inspection interval - 5 years.

b. Sampling Plan: Periodic inspection sample size and accept/reject criteria will be IAW Chapter 2 for both flare and impulse cartridges.

AF-4. Specific Inspection Points. Flare and Impulse Cartridges will be inspected and classified according to Chapter 2 of this manual and Tables AF-1 through AF-3 of this appendix.

Table AF-1. Packaging Defects

Classification	Application	Inspection Method	Inspection Description
1. Critical: None defined.			
2. Major:			
a. Outer/inner container broken or damaged.	M206, M211, M212, BBU-35/B, M796	Visual	Para AF-5a
b. Contents of inner container loose.	M206, M211, M212, BBU-35/B, M796	Visual/Manual	Para AF-5a
c. Developed rust on inner container.	M206, M211, M212, BBU-35/B, M796	Visual	Para AF-5a
d. Caked rust on hermetic container.	BBU-35/B , M796	Visual	Para AF-5a
e. Bulging inner container.	M206	Visual	Para AF-2
f. Hermetic container dented greater than ⅜ inch.	BBU-35/B , M796	Visual	Para AF-5a
g. Hermetic container punctured, rusted through or not sealed.	BBU-35/B, M796	Visual	Para AF-5a
3. Minor:			
a. Outer container moldy, dry rot or wet.	M206, M211, M212, BBU-35/B, M796	Visual	Para AF-5a
b. Inner/hermetic container with rust.	M206, M211, M212, BBU-35/B, M796	Visual	Para AF-5a
c. Outer/inner/hermetic container missing or illegible markings.	M206, M211, M212, BBU-35/B, M796	Visual	Para AF-5c
d. Key missing from exterior of can.	BBU-35/B, M796	Visual	Para AF-5j

Table AF-2. M206/M211/M212 Flare Defects.

Classification	Application	Inspection Method	Inspection Description
1. Critical:			
Piston Missing.	M206, M212	Visual	Para AF-5k Reject
2. Major:			
a. Body damaged.	M206, M211, M212	Visual	Reject
b. End cap damaged, missing, or not secure.	M206, M211, M212	Visual/Manual	Reject
c. Receptacle damaged or obstructed.	M206, M211, M212	Visual	Reject
d. Plastic case flare body.	M206	Visual	Para AF-5g
e. Electronic decal at back of flare/decoy missing or visibly damaged.	M211, M212	Visual	Para AF-5i
f. Metal frangible disk seal at bottom of impulse cartridge receptacle missing or damaged.	M211	Visual	Reject

3. Minor:			
a. Body wet or evidence of moisture.	M206, M211, M212	Visual	Para AF-5d
b. O-ring missing or damaged in receptacle.	M206, M211, M212	Visual	Para AF-5e
c. Markings missing or illegible.	M206, M211, M212	Visual	Para AF-5c
d. Dust cap missing or damaged.	M206, M212	Visual	Para AF-5f
e. Strings missing from top of ammunition can.	M211	Visual	Para AF-5h

Table AF-3. BBU-35/B & M796 Impulse Cartridge Defects.

Classification	Application	Inspection Method	Inspection Description
1. Critical:			
a. Body ruptured or punctured.	BBU-35/B, M796	Visual	Reject
b. Closure disc punctured.	BBU-35/B, M796	Visual	Reject
2. Major:			
a. Body dented or bent.	BBU-35/B, M796	Visual	Reject
b. Corrosion on head of firing electrode pin.	BBU-35/B, M796	Visual	Reject
c. Body distorted and cannot be installed without undue force.	BBU-35/B, M796	Visual	Reject
d. Shelf/service life expired.	BBU-35/B, M796	Visual	Reject
e. Cartridge returned from unit failed to fire or misfire.	BBU-35/B, M796	Visual	Reject
f. Incomplete or missing red sealant on front and back of impulse cartridge.	BBU-35/B, M796	Visual	Reject
3. Minor:			
Markings missing or illegible.	BBU-35/B, M796	Visual	Para AF-5c

AF-5. Inspection Description and Notes.

a. Defective containers must have their contents inspected for defects IAW Tables AF-2 or AF-3. Repair or replace container as needed.

b. Loose contents must be inspected IAW Tables AF-2 or AF-3 and if serviceable, repacked.

c. Missing or illegible markings will be corrected. If not correctable, or items cannot be identified then reject.

d. Flares with wet body or with evidence of moisture will be wiped dry. Dunnage inside packaging should be replaced with dry packaging.

e. Install or replace missing or damaged impulse cartridge receptacle o-rings as needed.

f. Replace dust caps with saved excess stocks. If excess caps are unavailable, use two - 1" x 1 ½" pieces of masking tape to cover the receptacle in a "+" configuration with sides folded down to secure tape.

g. The following lots of M206 flare were procured with plastic cases that are prone to cracking during sudden elevation changes on aircraft. These lots are restricted IAW TB 9-1300-385.

(1) BER lots w/interfix #001, 002, 003.

(2) LOW lots w/interfix #017, 019, 020.

(3) MBT lots w/interfix #004, 005, 006,007, 008,009.

h. Replace strings with saved excess stocks. Tape to interior top of ammunition can.

i. M211 and M212 Countermeasures without decals must be zone loaded in dispensers and cannot be utilized in dispensers set to automatically distinguish between flare types.

j. Replace missing key with saved excess stocks. Tape to exterior top of can. Alternatively, pliers can be used to grasp tear strip to open can.

k. Remove dust cap and view in rear of M206 for presence of white four legged piston.

APPENDIX AG
NON-LETHAL GRENADES

AG-1. Item Description.

a. DODACs: 1330-

GG04 GG09 GG17 GG18 GG19

b. Ammunition Type:

Grenade, Hand, Rubber Ball, Non-Lethal
Grenade, Hand: Non-lethal, Stun, M84
Grenade, Hand: Practice, Stun, Reloadable, M102
Grenade Body, M102
Fuze, Grenade: Hand, Stun, Cartridge, M240

c. Grenade, Hand, Rubber Ball, Non-Lethal (GG04). Grenade uses NSN 1330-01-454-0132 for old configuration and NSN 1330-01-503-1036 for new configuration (with confidence clip and longer fuze safety lever). This is a non-lethal bursting hand grenade that is filled with approximately 100 .32 caliber rubber ball projectiles. The intent of this grenade is to cause non-lethal effects on its target to be used for force protection, peacekeeping, crowd control, and internment missions. The grenade disperses the rubber balls along with accompanying sound and flash. The GG04 uses a commercial variant of the M201A1 pyrotechnic delay-igniting fuze. There are two delays accompanying this grenade. The first delay is in the fuze which initiates a separating charge and a secondary delay element. The separating charge causes the fuze block assembly to be separated from the grenade. After this the final delay element burns, the main charge is initiated dispelling the rubber balls. A large piece of tape keeps the fuze block attached to the grenade body along with some internal fittings on this setup. The total delay time ranges from 1.7 to 3.5 seconds. For the new configuration, the total delay is 2.2 to 3.2 seconds. The new configuration GG04 has changes to the fuze which are a longer fuze safety lever and the addition of the confidence clip.

d. Grenade, Hand: Non-lethal, Stun, M84 (GG09). The M84 is a non-fragmentation, non-lethal, "Flash and Bang" stun hand grenade intended for hostage rescue, or capture of criminals, terrorists, or other adversaries. It provides a reliable, effective non-lethal means of neutralizing & disorienting personnel. The stun grenade produces an intense flash exceeding 1 million candlepower with accompanying noise level between 170 to 180 dB. The grenade is assembled with a commercial variant of the M201A1 pyrotechnic delay-igniting fuze with a delay time range of 1.5 +0.8/-0.5 seconds. The fuze contains a primer, first fire mixture, pyrotechnic delay column and ignition mixture. The fuze body contains a striker, striker spring, safety lever with brown band, primary safety pin with circular pull ring and secondary safety pin with triangular pull ring.

e. Grenade, Hand: Practice, Stun, Reloadable, M102 (GG17), Grenade Body, M102 (GG18), and Fuze, Grenade: hand, stun, cartridge, M240 (GG19). The M102 serves as a reusable, economical training device for the M84. The assembled M102 consists of the M102 reusable steel body and the M240 Fuze Cartridge. The M240 consists of a commercial variant of the M201A1 pyrotechnic delay-igniting fuze, and a cartridge with cap plug, containing the stun charge. The fuze and total delay time is identical to that of the M84. The M102 body is painted blue and is designed to be reused multiple times (minimum 10 reuses, maximum 10 reuses) to reduce training costs. When recovered, the expended M240 Fuze Cartridge can be unscrewed from the M102 body and replaced with another M240 Fuze Cartridge.

AG-2. Unique Safety Precautions.

a. Grenades should never be lifted or handled by the safety pin pull ring(s).

b. Before any grenade is removed from its packaging container, it must be thoroughly inspected to see that the safety pin(s) are in place, undamaged, and prongs of the safety pin are spread approximately 45 degrees.

c. If grenade is upside down in the packaging container (fuze not visible), or if any of the above discrepancies are noted, it should remain inside the container and action taken to dispose of it safely.

d. Use an appropriate air purifying respirator if exposure is to occur during function tests.

(1) In high concentrations or on prolonged exposures, Hydrogen Chloride (HCl) can cause respiratory tract signs and symptoms, including noticeable pain, cough, inflammation, edema, and a high concentration bronchial constriction.

(2) In high concentrations or on prolonged exposures, potassium perchlorate can interfere with the thyroid glands functioning. Use an appropriate air purifying respirator if exposure is to occur during function tests.

e. Always wear proper safety equipment (ie. Safety glasses). When inspecting grenades, APE-1213M1 “Pitch–in-barricade” is recommended to be in place, during visual inspection.

f. Be sure that the fuze has not separated from the grenade when in the packaging container.

g. To preclude fuze pins from being inadvertently pulled, users are cautioned to comply with the following procedures:

(1) Retain the grenade in packaging container until they are to be used/inspected.

(2) Always store and transport grenades in packaging container.

(3) Prior to removing the grenade from the packaging container, observe the fuze safety pin(s). If either one is missing, do not remove the grenade/fuze cartridge from the packaging container. If both legs of the pin(s) are straight or if one leg is straight and the other is bent to an angle less than 45 degrees, bend the/a leg to at least 60 degrees.

h. The confidence clip has been added or will be added to a number of grenades in an effort to prevent the taping of grenades. Removal of the pull ring from the confidence clip can damage/distort the head of the safety pin and should not be reengaged.

AG-3. Testing and Equipment Requirements. No inspection tests applicable. ASRP tests will be conducted under the CCFTP program.

AG-4. Inspection Category and Sampling Plan.

a. GG04, GG09, GG17, GG19: Inspection Category Z; Periodic inspection interval, two years.

b. GG18: Inspection Category W; Periodic inspection interval, five years

c. Sampling plan for inspection is according to Chapter 2.

d. Inspection criteria for fuzes are contained in Appendix S.

e. Item will be inspected and classified according to Chapter 2 and Table AG-1.

AG-5. Inspection Description and Notes.

a. Grenade sticky or tacky. This refers to the rubber body of the grenade having this condition. The stickiness of the grenades may be an indication of degraded rubber body and could result in excessive duds. These grenades should not be used.

b. Grenades should be protected from exposure to direct sunlight and high humidity. Grenades exposed to these conditions should be inspected prior to issue/use for a sticky texture on the rubber body. A sticky/tacky grenade body is an indication of storage at high temperatures. Exposure to high humidity conditions which may also cause excessive dud rates.

c. Do not reinsert the pull ring into the confidence clip. Reclassify grenade to CC-F for refuzing – defect code FZ151 applies. A grenade with the pull ring disengaged from the confidence clip should not be considered unsafe unless evidence of damage to the safety pin is present to the extent that it endangers the user. This defect criteria does not apply to grenades manufactured without a confidence clip.

AG-6. References.

a. TB 9-1330-211-14.

b. TM 9-1330-200-12.

c. TM 9-1330-200-34.

d. TM 43-0001-29.

Table AG-1. Item Defects and Method of Inspection			
Classification	Application	Inspection Method	Inspection Description
1. Critical:			
a. Incorrect model fuze assembled to grenade.	All	Visual	
b. Safety pin(s) missing, or insecurely assembled to the extent that it endangers the user.	All	Visual	
c. Grenades mixed within lot which can result in hazardous or unsafe conditions for persons using or maintaining items.	All	Visual	
d. Grenade packed upside down in packaging container.	All	Visual	
e. Grenade contents spilling out.	All	Visual	
2. Major:			
a. Missing rubber ball projectiles.	GG04	Visual	
b. Fuze block assembly tape missing or loose.	GG04	Visual	
c. Fuze assembly loose.	All	Visual	
d. Grenade type and/or lot number incorrect or missing.	All	Visual	
e. Rust or corrosion on grenade/fuze components to the extent that item cannot be used as intended.	All	Visual	
f. Grenades cannot be removed from container.	All	Visual	
g. Damage to rubber body or sticky/tacky texture.	GG04		AG-5a.
h. Pull ring detached from confidence clip.	As applicable	Visual	AG-5b.
i. Damage to steel body.	M84, M102	Visual	
3. Minor:			
a. Marking incomplete or illegible but type of grenade and lot number are identifiable.	All	Visual	
b. Minor rust/corrosion.	All	Visual	
c. Markings incorrect or missing on container.	All	Visual	

APPENDIX AH
PROJECTILE, 155-MM, ER, PG, UNITARY, HE, XM982 (EXCALIBUR)

AH-1. Item Description.

a. FSC: 1320.

b. Ammunition Type: Projectile, 155mm, ER, PG, Unitary, HE, XM982.

c. Item is a separate loading, extended range, precision guided, high explosive projectile, XM982, also known as the Excalibur Projectile.

AH-2. Unique Safety Precautions.

a. Use extreme care when handling XM982 (Excalibur) projectiles. Removal from container requires use of integrated extraction strap and two person lift technique. Do not lift projectile by nose section or base hood located at the projectile base end as damage to these areas may result.

b. XM982 Excalibur Containers contain a desiccant bag in the container cap which contains silica pellets that are harmful to exposed skin and lungs. Handle broken desiccant bags with care. Do not inhale exposed desiccant. Avoid contact with skin. Wear eye protection when handling broken desiccant bags and avoid contact with the eyes. If desiccant comes in contact with eyes, rinse eyes with water thoroughly. If a broken bag becomes wet, the desiccant and bag may become extremely hot and can burn skin if touched. If the bag becomes wet, allow to cool at least five minutes before handling.

AH-3. Testing and Equipment Requirements.

No gaging or special testing is planned as part of the ammunition surveillance portion of the ASRP for this projectile. Extensive developmental testing and detailed ballistic testing will be the primary source of data for reliability estimates according to AR 702-6.

AH-4. Inspection Category and Sampling Plan.

a. RI will be accomplished IAW Chapter 2 and criteria contained in Tables AH-1 and AH-2. During RI and SMI, container will not be opened unless humidity indicator is any color other than blue. RI will consist of container exterior only unless container is damaged or compromised. Container will not be opened unless seal is broken.

b. PI inspection is not required. In lieu of a PI, storage monitoring (SMI) of the XM982 will be performed every 6 months. SMI will consist of 100 percent verification of the humidity indicator. Whenever the container is opened for replacement of desiccant, an inspection of the projectile will be performed according to Table AH-2 and results noted on the DSR.

AH-5. Inspection Description and Notes.

Container and projectile will be inspected according to Chapter 2 and criteria contained in Tables AH-1 and AH-2 (as appropriate). SMI will consist of monitoring the humidity indicator. If required, opening of samples will be performed in such an environment as to limit possibility of moisture entering the container. These inspections will not be performed during periods of high humidity, (such as rainstorms). The time a container remains open or a projectile is removed from container will be kept to a minimum necessary to perform inspection. Accept or reject for the inspection of projectile and inner pack will be 0 and 1 respectively for critical and major defects. Outer pack accept or reject will be according to Chapter 2.

AH-6. Inspection Description and Notes.

a. Humidity indicator.

(1) If the humidity indicator is a color other than blue for XM982, the desiccant must be changed. The humidity indicator is reversible and will change back to blue when exposed to new desiccant.

(2) Inspection of the projectile is required any time desiccant is changed and will be performed according to Table AH-2 and results noted on the DSR.

(3) New humidity indicator is required if damaged or wet.

(4) Time that the projectile, container, and the desiccant bag are open or exposed to the atmosphere should be kept to a minimum. For inspection purposes, do not keep container open any longer than necessary (15 minutes maximum). Unnecessary exposure can limit the shelf life of the bag and compromise the integrity of the projectile and container.

b. Container.

(1) Conduct standard pressure test on container utilizing test port on container end cap any time the desiccant bag is changed. The container must hold an internal pressure of 3-4 psi for a minimum of ten seconds.

(2) If the air test screw is loose, tighten to 30 in-lbs. If the air test screw is missing, replace with suitable replacement and tighten to 30 in-lbs.

c. Serial Numbers.

(1) If any serial numbers are illegible or missing on container, verify with other labels on the container and mark accordingly.

(2) If any serial numbers are illegible or missing on projectile, verify with other label on projectile or labels on container if matching container is available and mark accordingly.

d. Desiccant Bag Breakage.

(1) Handle broken desiccant bags with care. Do not inhale exposed desiccant. Avoid contact with skin. Wear eye protection when handling broken desiccant bags and avoid contact with the eyes. If desiccant comes in contact with eyes, rinse eyes with water thoroughly. If a broken bag becomes wet, the desiccant and bag may become extremely hot and can burn skin if touched. If the bag becomes wet, allow to cool at least five minutes before handling.

(2) Use vacuum and appropriate means to remove desiccant residue from broken bag. Desiccant residue must be removed from container before container can be used.

(3) Replace desiccant bag if missing or broken.

Table AH-1. Metal Container Exterior		
Classification	Inspection Method	Inspection Description
1. Critical: None defined.		
2. Major:		
a. Broken weld on ring or rims	Visual	Replace Container
b. Container body or IM windows dented or cracked enough to affect the ability to maintain seal.	Visual	Replace Container
c. Rope on cover cut or frayed.	Visual	Replace Container
d. Missing screws around IM windows.	Visual	Replace Container
e. Damaged or missing gasket or IM window.	Visual	Replace Container
3. Minor		
a. Any section of the humidity indicator is not blue.	Visual	Para AH-6a
b. Damaged or loose humidity indicator.	Visual	Para AH-6a
c. Wire security seal on cover broken or missing.	Visual	Inspect IAW AH-2
d. Cover air test screw loose or missing.	Visual	Para AH-6b
e. Serial number missing or illegible on container	Visual	Para AH-6c
f. Bar code label missing or illegible.	Visual	Replace Label

Table AH-2. Projectile and Container Interior		
Classification	Inspection Method	Inspection Description
1. Critical:		
a. Evidence of PBXN-9 leakage.	Visual	
b. Any of the 12 warhead IM vent plugs missing or loose.	Visual	
c. Damaged or broken plastic radome.	Visual	
d. Any of the 12 radome screws missing or loose.	Visual	
e. Dented, missing or loose base hood.	Visual	
f. Cracked or deeply gouged obturator.	Visual	
g. Damaged, broken or loose plastic Height of Burst (HOB) nose section.	Visual	
2. Major:		
a. Missing or illegible serial number on projectile.	Visual	Para AH-6c
b. Major rust or pitting on projectile.	Visual	
c. Base foil seal missing or broken.	Visual	
3. Minor		
a. Minor rust or paint deterioration on projectile.	Visual	
b. UID label peeling off or missing.	Visual	
c. The marking “USE AT MACS -3 OR -4 CHARGE ONLY” is missing or illegible for XM982 Projectiles**.**	Visual	Restore Marking
d. Missing or ripped strap	Visual	Replace Strap
e. Obturator cover latch broken or cover missing.	Visual	Replace
f. Dirt, debris, foreign matter, or desiccant residue from broken bag on projectile.	Visual	Clean Projectile
g. Desiccant bag missing or broken.	Visual	Para AH-6d

AH-7. Collection of Data from RRAPDS-Excalibur Temperature Data Recorders.

a. Some shipments of Excalibur projectiles will have an "RRAPDS-Excalibur Temperature Data Recorder" mounted on the container lid with Velcro and wire cables. The data recorder will monitor the temperature exposure history of the projectile.

b. QASAS personnel shall collect data from RRAPDS-Excalibur temperature data recorders at time of receipt (during receipt inspection), biannually while in storage in theater (during storage monitoring inspection), and immediately prior to issue to unit (pre-issue inspection).

c. Data will be collected using the maintenance support device (MSD) portable computer which will be issued to the supporting QASAS by the supporting Activity/Unit. Instructions for use of the MSD are contained within the MSD itself and are accessed from an icon on its display screen.

d. To perform data collection, the QASAS will:

(1) Remove the RRAPDS device from the Velcro on the lid.

(2) Depress button on case and slide apart the two halves.

(3) Insert mini USB cable end into exposed port on side of RRAPDS-Excalibur temperature data recorder.

(4) Connect larger end of USB cable to the MSD by USB port.

(5) Collect data following instructions on MSD.

(6) Reverse above process and reattach to the container lid.

e. The RRAPDS device is to remain on the container lid until the Excalibur round is fired. After firing, the RRAPDS device will be removed by the firing unit and returned to:

Office of PM Excalibur
SFAE-AMO-CAS-EX, BLDG 172
Picatinny Arsenal, NJ 07806-5000

by inserting it into the postage paid envelope found under the handle on top of the container lid

NOTE: only one RRAPDS device is allowed to be sent by envelop.

Highest return rates will help ensure greatest benefit from RRAPDS data collection efforts.

f. If a fired round had a RRAPDS-Excalibur temperature data recorder present on the container, units will annotate this fact on the firing report for that specific round.

APPENDIX AJ
BRADLEY FIGHTING VEHICLE REACTIVE ARMOR TILES VEHICLE SET (BRAT)

AJ-1. Item Description.

a. FSC: 1375.

b. Ammunition Type: Armor Tile, Vehicle Sets.

c. BRAT sets consist of various low-sensitive tile components, which when mounted on the vehicle will provide protection from small arms fire and RPG rounds.

AJ-2. References:

a. TM 9-1375-217-14&P, Technical Manual Operator, Field, And Sustainment Maintenance Manual (Including Repair Parts And Special Tools List) For Bradley Reactive Armor Tiles (BRAT): Vehicle Set (M3 Thru M7) (1375-01-453-7834) Vehicle Set (M3A1 Thru M7A1) (1375-01-453-7835) Vehicle Set (M3A2, M4A2, M5A2, M6A1, AND M7A1) (1375-01-516-2441) Vehicle Set (M3A2, M4A2, M5A2, M6A1, AND M7A1) (1375-01-530-5634) Installation Kit (5340-01-275-2566) Installation Kit (5340-01-537-8673) Vehicle Modification Kit (2350-01-521-4750) And Camouflage Cover (1080-01-541-2475) Cloaking Assembly (2350-01-424-9697) For M2A2/M2A2ODS /M2A3 Infantry Fighting Vehicle And M3A2/M3A2 ODS/M3A3 Cavalry Fighting Vehicle - Dated 30 MAY 2008.

b. TB 9-1375-234-12 Technical Bulletin, Operator And Unit Information For Installation Kit: Armor Tile, NSN 5340-01-537-8673, Dated 10 May 2006.

AJ-3. Components/Configuration: (See Table AJ-1 and AJ-2):

a. First generation BRAT sets – A0 version - (DODIC MN42) consist of 105 ea armor tiles:

(1) 26 ea M3 tiles.

(2) 9 ea M4 tiles.

(3) 55 ea M5 tiles.

(4) 7 ea M6 tiles.

(5) 8 ea M7 tiles.

b. Second Generation BRAT sets – A1 version - (DODIC MN43) consists of 105 ea armor tiles:

(1) 26 ea M3A1 tiles.

(2) 9 ea M4A1 tiles.

(3) 55 ea M5A1 tiles.

(4) 7 ea M6A1 tiles.

(5) 8 ea M7A1 tiles.

c. Third Generation BRAT sets – A1/A2 version - (DODIC MN94) consist of 96 ea armor tiles with either LF2 or LBR6 explosive filler.

(1) 18 ea M3A2 tiles.

(2) 8 ea M4A2 tiles.

(3) 55 ea M5A2 tiles.

(4) 7 ea M6A1 tiles.

(5) 8 ea M7A1 tiles.

AJ-4. Explosive Filler (See Table AJ-3):

a. LF2 explosive is a flexible sheet explosive used in both A1 and A2 tiles. LF2 is a low sensitivity / low flammability explosive.

b. LBR6 explosive is used as the flexible explosive sheets in addition to LF-2. LBR6 is also a low Sensitivity / low flammability, flexible sheet explosive developed specifically for reactive armor.

c. In addition to a change in NSNs, armor tiles loaded with LF2 will have serial numbers beginning with “LF”. For LBR6 loaded tiles the serial numbers will begin with “LB”.

AJ-5. Physical Differences Between A1 And A2 Versions Of Tiles: (See Table AJ-3):

a. The M3A2 tile is 64.8 lbs, which is 25 lbs heavier than the M3A1 tile. It is also approximately 3 inches thicker.

b. The M4A2 tile is a combination of the M4A1 and M3A1 tile.

c. The M5A2 tiles did not change in size, but they are 6 lbs heavier.

AJ-6. Mounting:

Mounting Instructions are covered in TM 9-1375-217-14&P.

Table AJ-1 – Armor Tile Vehicle Sets

Vehicle Set (P/N)	NSN	DODIC	Pallets
A0 (12982782)	1375-01-453-7834	MN42	3 Pallets Of M5, 1 Combination Pallet Of M3, M4, M6, M7
A1 (12982783)	1375-01-453-7835	MN43	3 Pallets Of M5A1 Tiles, 1 Combination Pallet Of M3A1, M4A1, M6A1, M7A1
A1/A2 With LF-2 (13004403)	1375-01-516-2441	MN94	3 Pallets Of M5A2 Tiles, 1 Pallet M4A2, 1 Combination Pallet Of M3A2, M5A2, M6A1, M7A1, Bolt Box
A1/A2 With LBR6 (13011748)	1375-01-530-5634	MN94	3 Pallets Of M5A2 Tiles, 1 Pallet M4A2, 1 Combination Pallet Of M3A2, M5A2, M6A1, M7A1, Bolt Box

Table AJ-2 – Components Of Armor Tile Vehicle Sets				
	NSN	**DODIC**	**COAI Drawing #**	**Number Of Tiles Per Set**
VEHICLE SET A0	1375-01-453-7834	MN42	12982782	
M3	1375-01-257-3981	ML93	12576353	26
M4	1375-01-257-3982	ML94	12576354	9
M5	1375-01-257-3983	ML95	12576355	55
M6	1375-01-257-3984	ML98	12576356	7
M7	1375-01-257-3985	ML99	12576357	8
VEHICLE SET A1	1375-01-453-7835	MN43	12982783	
M3A1	1375-01-410-7414	ML93	12972559	26
M4A1	1375-01-410-7413	ML94	12972560	9
M5A1	1375-01-410-7416	ML95	12972561	55
M6A1	1375-01-410-7415	ML98	12972562	7
M7A1	1375-01-410-7417	ML99	12972563	8
VEHICLE SET A1/A2 (WITH LF-2)	1375-01-516-2441	MN94	13004403	
M3A2	1375-01-516-1625	MN92	13004402	18
M4A2	1375-01-516-1623	MN93	13004401	8
M5A2	1375-01-516-1642	ML95	13004400	55
M6A1	1375-01-410-7415	ML98	12972562	7
M7A1	1375-01-410-7417	ML99	12972563	8
VEHICLE SET A1/A2 (WITH LBR6)	1375-01-530-5634	MN94	13011748	
M3A2	1375-01-530-5625	MN92	13011599	18
M4A2	1375-01-530-5627	MN93	13011598	8
M5A2	1375-01-530-5628	ML95	13011597	55
M6A1	1375-01-530-5630	ML98	13011596	7
M7A1	1375-01-530-5633	ML99	13011595	8
INSTALLATION KITS				
INSTALLATION KIT	5340-01-275-2566		12576358	
INSTALLATION KIT	5340-01-537-8673 (new mounting kit)		13011862	

Table AJ-3 - A1 And A2 Tile Specifications							
DODIC	**NSN**	**P/N**	**TILE**	**EXPL**	**Dimensions (IN)**	**WT (LBS)**	**NEW (LBS)**
ML93	1375-01-410-7414	12909997	M3A1	LF2	12.91x12.13x3.29	37.5	4.02
ML94	1375-01-410-7413	12909998	M4A1	LF2	7.96x12.13x3.61	7.14	0.64
ML95	1375-01-410-7416	12909999	M5A1	LF2	12.89x15.65x12.16	88.0	5.93
ML95	1375-01-516-1642	13004397	M5A2	LF2	12.94x15.65x12.16	94.58	8.47
ML95	1375-01-530-5628	13004397-2	M5A2	LBR6	12.94x15.65x12.16	93.68	7.57
ML98	1375-01-410-7415	12972562	M6A1	LF2	7.49x7.90x11.40	30.25	2.40
ML98	1375-01-530-5630	13011596	M6A1	LBR6	7.49x7.90x11.40	29.95	2.1
ML99	1375-01-410-7417	12972563	M7A1	LF2	7.49x7.90x11.40	22.45	1.81
ML99	1375-01-530-5633	13011595	M7A1	LBR6	7.49x7.90x11.40	22.0	1.62
MN92	1375-01-516-1625	13004402	M3A2	LF2	12.90x12.13x6.27	64.60	6.16
MN92	1375-01-530-5625	13011599	M3A2	LBR6	12.90x12.13x6.27	64.38	5.94
MN93	1375-01-516-1623	13004401	M4A2	LF2	16.85x12.13x6.28	57.1	6.16
MN93	1375-01-530-5627	13011598	M4A2	LBR6	16.85x12.13x6.28	56.23	5.29

Table AJ-4 - New Mounting Bolts			
NSN	**Part Number**	**Description**	**QTY**
5305-01-521-4710	13005627-1	8 Inch Bolt, 3/8” UNC	96 Each
5306-01-521-4555	13005627-2	5 Inch Bolt, 3/8” UNC	20 Each
2350-01-521-4750	13006119	Bolt Box	1 Per Kit

Table AJ-5 – Item Defects And Method Of Inspection			
Classification	**Application**	**Inspection Method**	**Inspection Description**
1. Critical: none			
2. Major:			
a. Holes / punctures 1 inch or greater	All	Visual	Para AJ-8b(1) & TM 9-1375-217-14&P, page 0019 00-1
b. Cracks	All	Visual	Para AJ-8d(1)
c. Distortion	All	Visual	Para AJ-8e(2)
d. Corrosion	All	Visual	Para AJ-8f(2)
e. Expose to external fire	All	Visual	Para AJ-8h(2)
f. Cover missing	All	Visual	Para AJ-8i
g. Foreign Matter inside tile	All	Visual	Para AJ-8j
h. Damaged / rusted mounting brackets	All	Visual	Para AJ-9b
3. Minor:			
a. Holes / punctures smaller than 1 inch	All	Visual	Para AJ-8c(1) & TM 9-1375-217-14&P, page 0019 00-1
b. Distortion	All	Visual	Para AJ-8e(1)
c. Corrosion	All	Visual	Para AJ-8f(1)
d. Scratches	All	Visual	Para AJ-8g(1)
e. Expose to external fire	All	Visual	Para AJ-8h(1)
f. Damaged / rusted mounting brackets	All	Visual	Para AJ-9a

AJ-7. Fielded Tile Serviceability:

******ATTENTION******

All damaged tiles deemed to be unserviceable must be considered to have unconsumed explosives in them, even those thought to be burned out.

All damaged tiles must be turned into the ASP for retrograde to an authorized demilitarization location (outside of SWA). Current EOD policy prohibits demilitarization in theater. Units should turn in their damaged tiles to the ASP on a DA Form 581 with a supporting DA Form 5811-R (Certificate - Lost or Damaged Class 5 Ammunition Items) stating the circumstances and signed by the first 05 in the unit chain of command.

a. TM 9-1375-217-14&P provides Preventive Maintenance Checks and Services (PMCS) guidance. Any internal damage to a tile will have degraded performance in the immediate location of the damage. However, several tests have been conducted on damaged tiles impacted by small arms with generally good results. The tests were done at least 2 inches from the damaged areas and it is the technical community's position that a damaged armor tile is better than no tile.

b. Areas where the tile has been penetrated and detonated will probably be ineffective against future attacks. Areas around the tile that have not been penetrated or detonated will probably remain very effective against future attacks.

c. Units may have patched tiles in one of the following manners to keep excessive foreign matter, such as sand, out of the armor tile:

(1) Tape would be the most expedient patch method.

(2) Common silicone or acrylic caulk could be used to seal cracks or patch small holes, or to hold a sheet metal patch in place. Care should be taken to not get excessive caulk in the tile.

*******WARNING*******

Repair methods that require heat (welding, soldering, torch, heat lamps, etc.) and shock (riveting, hammering, etc.) should not be used.

It is important that any damaged tile be used if there is no replacement BRAT available. Having any BRAT is better than no armor tile at all. But if a damaged armor tile is used, then it should be patched with any available materials to keep it from being contaminated from moisture and debris.

AJ-8. Inspection Category And Criteria For Armor Tiles - this inspection criteria is for all versions of armor tiles (M3, M3A1, M3A2, M4, M4A1, M4A2, M5, M5A1, M5A2, M6, M6A1, M7, AND M7A1):

a. Inspection Category X – 4yr. Periodic inspection sample size and accept/reject criteria will be according to Chapter 2.

b. Inspection of armor tiles with punctures/holes of 1 inch diameter or greater:

(1) If the hole is at an impact angle such that the internal plates have been disrupted, detached, or separated, the armor tile should be declared unserviceable and replaced when a replacement is available.

(2) If the tile has partially detonated, but there is no replacement available, the tile can still be used. It is recommended that the part of the tile that has been damaged be sealed with locally available materials (tape, etc.) to prevent damage from moisture contamination or debris. The armor tile should be replaced when a replacement is available.

c. Inspection of armor tiles with punctures/holes of 1 inch diameter or smaller:

(1) Tiles should be considered serviceable if the holes are covered up (using tape, etc.). If there are multiple holes, then the tile may still be considered serviceable, but it should be replaced if replacement tiles are available.

(2) Holes should be sealed to prevent damage from moisture and debris (tape, "bondo", or caulk, etc). Care should be taken to prevent excessive material from entering the armor tile.

d. Inspection procedures of armor tiles with cracks:

(1) Armor tiles are considered serviceable if the crack does not affect how the armor tile is mounted, and if there is no noticeable internal contamination.

(2) Cracked seams should be caulked, if possible, to eliminate possible contamination from moisture or debris.

e. Inspection procedures of armor tiles with distortion:

(1) Tiles with minor distortion and no other visible damage, which can still be mounted securely, should be considered serviceable.

(2) If the tile has major distortion, it should be replaced. However, if there is no replacement for the armor tile, the tile should still be considered serviceable, providing that the tile can still be mounted securely.

f. Inspection procedures of armor tiles with corrosion:

(1) Minor exterior corrosion is acceptable.

(2) Tiles should be considered unserviceable if major external corrosion is present, especially if the corrosion penetrates to the inside of the armor tile. If there is no replacement for the armor tile, the tile can still be considered serviceable, providing that the tile can still be mounted securely.

g. Inspection procedures of armor tiles with scratches:

(1) All tiles with minor surface scratches are considered serviceable.

(2) Scratches can be touched up, if necessary, at the Ammunition Supply Point (ASP).

h. Inspection procedures to armor tiles exposed to external fire:

(1) If there is cosmetic damage to the paint and outer-surface of the armor tile and the tile can still be securely mounted, the armor tile should be considered serviceable. It is recommended that, when the tiles are turned in, they are cleaned up and repainted at the ASP.

(2) If the tile has noticeable bulging due to exposure to fire, the tile should be deemed unserviceable and replaced.

(3) Touchup surface/paint damage, if necessary, at the ASP.

i. If the cover of the armor tile is missing, then it should be considered unserviceable.

j. If it is known that water, dirt or other external elements are in the armor tile before it gets patched up, the tile should be drained/emptied out and given time to dry prior to patching/sealing.

AJ-9. Inspections For Mounting Brackets And Tile Guard:

a. If there are rust, broken welds, or broken brackets that do not affect the function/purpose of the equipment, then it is considered serviceable if there are no replacements available. It is recommended that the damaged equipment be patched/sealed up with any available materials.

b. Replace/repair any damaged mounting brackets and tile guards at the ASP. Again, if no replacements exist, repair the damaged equipment with any available materials to consider the equipment serviceable.

APPENDIX AK
MUNITION, CROWD CONTROL MODULAR, NON-LETHAL: M5 (1346-WA97)

AK-1. Item Description.

a. DODACs: 1346-WA97.

b. Ammunition Type:

Munition, Crowd Control, Modular, Non-Lethal: M5.

c. Munition, Crowd Control, Modular, Non-Lethal: M5 (WA97) is known as the MCCM. The MCCM delivers non-lethal effects to personnel without penetrating the body by delivering a strong blow with multiple submunitions. The MCCM has two configurations:

(1) NSN 1346-01-464-2606 (old configuration) is packaged with separate items consisting of: a 100 foot shock tube, a blasting cap, a separate M81 igniter, a sealing nut, and a shock tube cutter.

(2) NSN 1346-01-524-3348 (new configuration) is packaged with a mini detonation assembly (which is a single assembly of 100 foot shock tube, igniter and blasting cap).

Both MCCM configurations contain 600 PVC balls inserted in a plastic case with a sheet explosive sandwiched between two foam sheets. A bandoleer is used to contain each individual MCCM and initiation system, along with an instruction sheet. The MCCM comes six munitions to a fiberboard box inside the wirebound box (wooden). The fiberboard box is wrapped in an overpack barrier bag. The MCCM and blasting cap assembly in each bandoleer are wrapped in individual barrier bags. The back color of the MCCM is a light green and states "BACK NON-LETHAL MCCM, M5". The front looks similar to the claymore mine with a dark green covering and lettering "FRONT TOWARD ENEMY".

AK-2. Unique Safety Precautions.

a. Assure that the Safety Pin is in place on the blasting cap assembly. "Missing safety pin is a critical defect IAW Table AK-1.1.a. Critical defects will be handled IAW paragraph 2-3.c.(7).

b. All personnel must stay outside of the SDZ during operation.

c. Always wear proper safety equipment.

d. Assure that MCCM is intact.

AK-3. Testing and Equipment Requirements.

No inspection tests applicable. ASRP tests will be conducted under the CCFTP program.

AK-4. Inspection Category and Sampling Plan.

a. Inspection Category Z; Periodic inspection interval, two (2) years.

b. Sampling plan for inspection is IAW Chapter 2.

c. Item will be inspected and classified according to Chapter 2, paragraph 2-7, and Table AK-1.

d. Barrier bags will be resealed upon completion of inspection.

AK-5. Inspection Description and Notes.

a. NSN 1346-01-464-2606 was initially produced under NSN 1377-01-464-2606 until the federal supply class (FSC) was changed from 1377 to 1346. Lots LS-01B002-001 to LS-03E002-044 have outer packs which were marked with FSC 1377. When shipping less than pallet size, remark single boxes with correct FSC (1346); when shipping pallets, apply correct NSN on two weather resistant boards placed on adjacent sides of pallet. Full remarking would be accomplished during future depot maintenance/renovation if lots are to be scheduled for rework.

b. NSN 1346-01-524-3348: Lots LS-04K003A001 to LS-07C005-005 were incorrectly marked M5A1 instead of M5. ADCs for these lots also reflect M5A1 as per the contractual agreement. These lots are acceptable as is and do not require changing markings. Remarking would be accomplished during future depot maintenance/renovation if lots are to be scheduled for rework.

c. The NEI barrier bag is only to be opened at the depot level during IRIs and scheduled cyclic inspections. The contents will be inspected for serviceability; the barrier bag reheat-sealed; and if bag requires replacement, Barrier Material, Vaporproofed, Flexible MIL-PRF-131 (8135-00-282-0565) is to be utilized. When unspooled, the minimum length of the NEI's shock tube is 65.5 meters (215 feet).

AK-6. References.

a. DMWR 9-1346-WA97-X1.

b. FM 3-19.4.

c. FM 3-19.15.

d. TM 9-1346-215-10.

e. TM 9-1377-617-12.

f. TM 43-0001-61.

Table AK-1. Item Defects and Method of Inspection			
Classification	Application	Inspection Method	Inspection Description
1. Critical:			
a. Safety pin missing from igniter.	Both configurations	Visual	Para 2-3c.(13)
b. MCCM cover not glued together or damaged with exposed explosives.	Both configurations	Visual	Para 2-3c.(13)
c. Blasting cap cracked, split, or has exposed explosive.	Both configurations	Visual	Para 2-3c.(13)
d. Shock tube cracked, split, or has exposed explosive.	Both configurations	Visual	Para 2-3c.(13)
2. Major:			
a. M81 blasting cap/100-foot shock tube assembly (other than 1.c. and 1.d. above) or igniter damaged.	1346-01-464-2606	Visual	
b. Mini detonation assembly damaged (other than 1.c. and 1.d. above).	1346-01-524-3348	Visual	
c. MCCM covers separating or damaged.	Both configurations	Visual	
d. Barrier bag missing.	Both configurations	Visual	
e. Shipping plug damaged or improperly assembled.	Both configurations	Manual/Visual	
f. Leg assemblies twisted, bent or otherwise damaged.	Both configurations	Visual	
g. Components missing.	Both configurations	Visual	
h. Rust on mini detonation assembly safety pin.	Both configurations	Visual	
i. Cup well damaged where blasting cap cannot be placed into it.	Both configurations	Visual	
3. Minor:			
a. Marking incomplete or missing on wirebound box or barrier bags (other than those mentioned in Para AK-5).	Both configurations	Visual	
b. Instruction sheet missing on bandoleer.	Both configurations	Visual	
c. Minor rust/corrosion.	Both configurations	Visual	

APPENDIX AL
CLASS V COMPONENTS OF THE SPIDER M7 DISPENSING SET, MUNITION NETWORK COMMAND.

AL-1. Item Description.

a. DODACs: 1346- TS01
TS02
TS04

b. Ammunition Type:

(1) M8, Launcher and Grenade, Network Command Munition (TS01).

(2) M9, Launcher and Line, Network Command Munition (TS02).

(3) M10, Munition, Control Unit (TS04).

c. The Spider M7 is a networked munitions system used as an anti-personnel landmine alternative. Its design provides perimeter defense and flank protection to the warfighter.

d. M8, Launcher and Grenade: this is the Miniature Grenade Launcher (MGL), which includes Grenade Initiation Module (GIM) and the grenade. The grenade itself uses the energetic materiel PAX-41, and is a lethal munition. The GIM features a low-energy exploding foil initiator (LEEFI) to detonate the grenade once it has left the launch tube, via an impulse cartridge. The impulse cartridge is a small energetic that propels the grenade from the body. This is all enclosed within the grenade launch tube, which attaches to the command unit.

e. M9, Launcher and Line: this is the Extended Range Tripline Sensor (ERTS), which provide a silent (from the enemy perspective) intrusion detection capability. Six light weight triplines are launched from the ERTS module, which is on top of the control unit, in 60° increments (aligning with MGLs on the control unit), via a gas generator. Once a tripline is triggered, it will send a message to the soldier overseeing the field, specifying what unit as tripped thus providing the opportunity to engage or not to.

f. M10, Munition Control Unit: the Munition Control Unit (MCU) is the unit which launches the MGL and ERTS. It can communicate with the field overseer and launch the six MGLs or single ERTS that can attach to it. The munitions can be fired in any sequence or combination. It features six tripline interfaces (for each munition port), a visual safe indicator, LED status indicator and on/off switch. There is a battery carriage incorporated into the MCU to provide power for over 30 days, depending on usage.

AL-2. Unique Safety Precautions.

a. Maintain MGLs, ERTS, and MCUs modules in appropriate containers until removal for inspection.

b. MGLs and ERTSs should not be stored, transported, or tested in severe electromagnetic environments.

c. MGLs and ERTSs will be stored with their EMI gaskets in place and inside their approved packaging for storage and transportation.

d. Consult local Surveillance SOPs for any additional safety requirements.

AL-3. Testing and Equipment Requirements.

None applicable.

AL-4. Inspection Category and Sampling Plan.

a. Inspection Categories:

(1) Category Y for 1346-TS01.

(2) Category W for 1346-TS02.

(3) Category W for 1346-TS04.

b. Sampling plan for inspection is IAW Chapter 2.

c. Item will be classified and inspected according to Chapter 2, paragraph 2-7 and Table AL-1.

AL-5. Inspection Description and Notes.

a. Remove the connector's dust and moisture seal cap from the M8 to inspect the Electromagnetic Interference (EMI) shield/gasket, the environmental O-ring and the connector. A missing connector cap (even with a present EMI shield/gasket) is a critical defect since the M8 would now be susceptible to EMI; a cap damaged to the extent that it can no longer provide EMI protection would also be a critical defect. Utilize foil wrap (secured with tape) over connector as a temporary fix until cap can be replaced or item properly disposed of.

b. Remove the M8 locking cover to inspect the foil seal.

c. The MCU battery cover requires removal for full inspection of cover, battery holder assembly, contact plate, and battery compartment interior. The MCU is non-mission capable if the battery cover does not seal properly and/or contains holes not preventing liquid from entering the battery compartment.

d. The MCU is non-mission capable if the lifting handle on the battery holder assembly is not present or functional; the assembly is cracked, split and/or dented/bent preventing retention of batteries; the assembly does not properly sit/lock into bottom of MCU; and/or corrosion/presence of foreign matter on assembly terminals prevents functionality.

e. Lift the MCU selector switch cover and ensure that it returns to original (closed) position.

f. Ensure the MCU selector switch interlocks at each position (hear/feel for 'click' of switch). The MCU is non-mission capable if the switch does not click at each position.

g. Test each MCU Hardwire Tripline Sensor (HWTS) for uninhibited (sticking effect) movement by turning 180° counter-clockwise and releasing. The sensor should spring back to its original position. The MCU is non-mission capable if the sensor does not spring back into place.

AL-6. References.

a. TM 9-1230-782-13&P.

b. TM 43-0001-61.

c. JMC DMWR 9-1346-TS01-X1.

d. JMC DMWR 9-1346-TS02-X1.

Table AL-1: Item Defects and Method of Inspection			
Classification	Application	Inspection Method	Inspection Description
1. Critical:			
a. EMI shield/gasket missing or damaged.	M8, M10	Visual/Manual	Para AL-5a
b. Connector's dust and moisture seal cap missing.	M8	Visual	Para AL-5a
2. Major:			
a. Body damaged - cracked, split, perforated and/or bent.	All	Visual	
b. Lot number missing or obliterated.	All	Visual	
c. Locking lever (latch) missing and/or damaged.	M8	Visual	
d. Connector's dust and moisture seal cap damaged/unserviceable.	M8	Visual	Para AL-5a
e. Connector damaged/unserviceable.	M8	Visual	
f. Locking cover and/or foil seal missing or damaged.	M8	Visual/Manual	Para AL-5b
g. Environmental O-ring missing or damaged.	M8	Visual	
h. Contact plates corroded or damaged.	M9	Visual	
i. Damaged alignment bridges (4).	M9	Visual	
j. Corrosion on the electronic components contacts.	M9, M10	Visual	
k. Battery cover with cracks, splits, holes, non-functional bends or damaged alignment bridges (4).	M10	Visual	
l. Battery cover not properly sealing/aligning.	M10	Visual/Manual	Para AL-5c
m. Battery holder assembly missing and/or damaged.	M10	Visual/Manual	Para AL-5d
n. Battery contact plate corroded, cracked, or damaged.	M10	Visual	
o. Battery compartment environmental seal missing, improperly attached, or damaged.	M10	Visual	
p. Selector switch missing, damaged, or inoperative.	M10	Visual/Manual	Para AL-5f
q. Tri-segment LED display and/or VSI (Visual Safe indicator) glass broken, cracked or damaged.	M10	Visual	
r. VSI seal missing.	M10	Visual	
s. VSI not in safe mode (Green).	M10	Visual	
t. HWTS damaged/inoperative.	M10	Visual/Manual	Para AL-5g
u. MCU's MGL connectors missing, damaged, corroded and/or missing pins.	M10	Visual	
v. Antenna connector missing, damaged or corroded.	M10	Visual	
w. Short range antenna missing or with broken or stained parts/tips.	M10	Visual	
3. Minor:			
a. Olive drab color chipped or missing.	All	Visual	
b. Markings (other than lot number) missing, obliterated or incorrect.	All	Visual	
c. Tripwire caps missing or unserviceable.	M9	Visual	
d. Dust and moisture seal caps for MGL ports, antenna connector, or HWTS missing or unserviceable.	M10	Visual	
e. Selector switch guard missing or damaged.	M10	Visual/Manual	Para AL-5e
f. Sandbags missing or unserviceable.	M10	Visual	
g. Stakes missing or unserviceable.	M10	Visual	
h. Hardwire tripline spools missing or unserviceable.	M10	Visual	

APPENDIX AM
ANTI-PERSONNEL OBSTACLE BREACHING SYSTEM (APOBS)

AM-1. Item Description.

a. DODACs: 1375- MN79
MN84

b. Ammunition Type:

(1) Anti-Personnel Obstacle Breaching System (APOBS) MK 7 MOD 1 and MK 7 MOD 2 (MN79)

(2) Anti-Personnel Obstacle Breaching System (APOBS), Inert (MN84)

c. The APOBS (MN79) is a self-contained, one-shot expendable linear demolition charge system, which can be transported and deployed by a two-person team. The APOBS is used by assault elements to breach lanes, approximately 45 meters long (147.6 feet) and 0.6 meters wide (2.0 feet), through encountered wire and anti-personnel mine obstacles. The MK 7 MOD 1 (Electric Squid) and the MK 7 MOD 2 (Non-Electric Initiator (NEI)) are the two current configurations.

d. The APOBS trainer (MN84) is a non-explosive, inert system used for training only. Operation is the same for both types of APOBS except that there will be no firing with the trainer.

e. The APOBS (MN79) can withstand storage conditions of -60 °F (-51 °C) to 160 °F (71 °C).

AM-2. Unique Safety Precautions.

a. The MK 19 MOD 0 electric squib, when out of its sealed barrier bag, can be detonated by radio frequency energy from a nearby source such as radio or radar transmitter. Ensure a safe separation of at least 2 meters (6.6 feet).

b. Keep the electric squib (with blast guard installed) in the sealed barrier bag to avoid accidental initiation from RF energy or electrostatic discharge.

c. If the electric squib's barrier bag is not sealed, it is not considered HERO safe.

d. Ensure the electric squib is pointed away from personnel at all times.

e. The Safe/Arm (S/A) indicators are a red ring on the large diameter end of the fuze and a red O-ring on the small diameter end of the fuze. If either is visible, the fuze is armed. Clear the area immediately and notify the Explosive Ordnance Disposal (EOD) Unit covering your installation/storage site.

f. When/if safety pins are not present, do not pull or twist on the rear fuze.

g. When/if safety pins are not present, do not pull or twist on the front fuze.

h. Ensure the NEI squib subassembly is pointed away from personnel at all times.

AM-3. Testing and Equipment Requirements.

None applicable.

AM-4. Inspection Category and Sampling Plan.

a. Inspection Categories:

(1) Category X (4 years) for 1375-MN79.

(2) Category W (5 years) for 1375-MN84.

b. Sampling plan for inspection is IAW Chapter 2.

c. Item will be classified and inspected according to Chapter 2 and Table AM-1.

AM-5. Inspection Description and Notes.

a. Remove the safety pin securing the front fuze blast guard. Remove the blast guard. Check that the S/A indicator is in the safe position. Check that the retaining clip is present, serviceable and properly installed. Reinstall the blast guard and safety pin to the front fuze.

b. Without opening the sealed barrier bag, feel through the package to verify that the blast guard is screwed onto the MK 19 MOD 0 electric squib.

NOTE: The Non-Electric Initiator (NEI), with or without its sealed barrier bag is insensitive to HERO (Hazards of Electromagnetic Radiation to Ordnance) as well as electrostatic discharges, including helicopter-induced discharge.

c. The NEI barrier bag is only to be opened at the depot level during IRIs and scheduled cyclic inspections. The contents will be inspected for serviceability; the barrier bag reheat-sealed; and if bag requires replacement, Barrier Material, Vaporproofed, Flexible MIL-PRF-131 (8135-00-282-0565) is to be utilized. When unspooled, the minimum length of the NEI's shock tube is 65.5 meters (215 feet).

d. Remove the safety pin securing the rear fuze blast guard. Remove the blast guard. Check that the S/A indicator is in the safe position. Check that the retaining clip is present, serviceable and properly installed. Reinstall the blast guard and safety pin to the rear fuze.

e. SMIs will be conducted on an annual basis. When stored in a high humidity environment, as determined by the Surveillance Chief, SMIs will be conducted on a quarterly basis. When required, humidity indicator and dessicant change will be accomplished IAW TM 9-1375-219-13&P.

f. Remove the foam pad (positioned on top of the grenades) from the opened backpacks to perform the inspection of the demo charges and the braided sleeves. Only inspect the visible portions of the items, do not uncoil the demo charges. Replace pads upon completion of the inspection.

g. Damage or obstruction preventing full insertion of the launch rod into the launch tube is cause for rejection. When questionable, obtain the launch rod from the front backpack and insert into the launch tube, do not force. If the launch rod does not completely enter the launch tube, reject.

AM-6. References.

a. TM 9-1375-219-13&P.

b. USMC 9-1375-PLAN-X02.

Table AM-1: Item Defects and Method of Inspection			
Classification	Application	Inspection Method	Inspection Description
1. Critical:			
a. Rocket motor safety pin and/or firing pin pull ring missing (stored in soft pack).	MN79	Visual	
b. Blast guard missing from front (black) fuze (stored in soft pack).	MN79	Visual	
c. Front (black) fuze armed (safety pins missing and red ring or o-ring visible) (stored in soft pack).	MN79	Visual	Para AM-5a
d. Blast guard missing from MK 19 MOD 0 electric squib (stored in soft pack).	1375-01-426-1376 MN79 (MK 7 MOD 1)	Manual	Para AM-5b
e. Electric squib foil bag open, torn or missing (stored in soft pack).	1375-01-426-1376 MN79 (MK 7 MOD 1)	Visual	
f. Non-Electric Initiator (NEI): M81 igniter missing safety pin and/or squib subassembly missing blast guard (stored in soft pack).	MN79	Visual	Para AM-5c
g. Blast guard missing from rear (green) fuze (stored in rear backpack assembly).	MN79	Visual	
h. Rear (green) fuze armed (safety pins missing and red ring or o-ring visible) (stored in rear backpack assembly).	MN79	Visual	Para AM-5d
2. Major:			
a. Structural damage to shipping & storage container exposing contents, or preventing intended use (punctures, dents, etc.).	All	Visual	
b. Pink shipping & storage container humidity indicator.	MN79	Visual	Para AM-5e
c. Shipping & storage container with missing or illegible lot number and/or NSN markings.	All	Visual	
d. Rust or corrosion compromising shipping & storage container integrity.	All	Visual	
e. Shipping & storage container interior components (to include backpack assemblies and soft pack contents) wet.	All	Visual/Manual	
f. Shipping & storage container missing one or more of its assemblies (front backpack, soft pack, rear backpack).	All	Visual	
g. Damage to front/rear backpack assemblies and/or soft pack exposing contents or preventing intended use (punctures, dents, rips, etc).	All	Visual	
h. Backpacks straps missing and/or damaged preventing intended use (rips, cuts, not adjustable, etc).	All	Visual	
i. Placement of linear demo charges in the front and/or rear backpack is incorrect (not factory packed to ensure free running).	MN79	Visual	Para AM-5f
j. Torn/cut polyester braided sleeve (overbraid), exposed grenades or det cord (front and rear backpack assemblies).	MN79	Visual	Para AM-5f
k. Launching rod missing or damaged (stored in front backpack assembly).	MN79	Visual	
l. Launch rod bracket missing or damaged (front backpack assembly).	MN79	Visual	
m. Male (black) and female (silver) connectors bent, broken, or otherwise damaged (front backpack assembly).	MN79	Visual	
n. Female connector with non-removable foreign matter in cavity (front backpack assembly).	MN79	Visual	
o. Female connector retaining clip missing or damaged (front backpack assembly).	MN79	Visual	
p. Rear (green) fuze missing, damaged, with	MN79	Visual	Para AM-5d

non-removable foreign matter in cavity and/or with missing/damaged retaining clip (stored in rear backpack assembly)			
q. Male connectors (one green, one silver) bent, broken, or otherwise damaged (rear backpack assembly).	MN79	Visual	
r. Front (black) fuze missing, damaged, with non-removable foreign matter in cavity and/or with missing/damaged retaining clip (stored in soft pack).	MN79	Visual	Para AM-5a
s. Rocket motor missing or damaged; attached launched tube damaged or with non-removable obstruction (stored in soft pack).	MN79	Visual	Para AM-5g
t. Steel bridle missing or damaged (stored in soft pack).	MN79	Visual	
u. Field card missing or unreadable (stored in soft pack).	MN79	Visual	
v. Electric squib missing (stored in soft pack).	1375-01-426-1376 MN79 (MK 7 MOD 1)	Visual	
w. Non-Electric Initiator (NEI): M81 igniter, squib assembly, shock-tube, shock tube loop, and/or spool missing or with damage/defects preventing intended use (stored in soft pack).	1375-01-508-4975 MN79 (MK 7 MOD 2)	Visual	
x. Missing and/or damaged components which would prevent use of the APOBS trainer.	MN84	Visual	
y. Missing or incorrect warning labels.	All	Visual	
3. Minor:			
a. Shipping & storage container markings (other than lot number and NSN) missing, misleading or unidentifiable.	All	Visual	
b. Damage to shipping & storage container NOT exposing contents or preventing intended use.	All	Visual	
c. Front backpack assembly, soft pack, and/or rear backpack assembly markings missing, misleading, incorrect or unidentifiable.	All	Visual	
d. Damage to front/rear backpack assemblies and/or soft pack NOT preventing intended use.	All	Visual	
e. Protective foam pads located inside front and/or rear backpack missing or damaged.	MN79	Visual	
f. Non-Electric Initiator (NEI): pre-assembled cable tie missing; protective foam pads, missing or damaged; spool with damage NOT preventing intended use (stored in soft pack).	1375-01-508-4975 MN79 (MK 7 MOD 2)	Visual	
g. Soft pack carrying strap missing and/or damaged.	All	Visual	
h. Foam cover missing or damaged (soft pack).	MN79	Visual	
i. Tool kit missing (stored in soft pack).	MN79	Visual	
j. Tool kit bag has missing or damaged components (2 pairs of ear plugs, 2 ea retaining clips, 1 screwdriver) (stored in soft pack).	MN79	Visual	
k. Tool kit bag has missing or damaged WD 1/TT wire (trainer only) (stored in soft pack).	MN84	Visual	
l. Missing and/or damaged components which would NOT prevent use of the APOBS trainer.	MN84	Visual	

APPENDIX AN
CARTRIDGE, 40MM

AN-1. Item Description.

a. DODACs and Ammunition Type:

(1) 1310-B504: Cartridge, 40mm, Green Star, Parachute, M661.

(2) 1310-B505: Cartridge, 40mm, Red Star, Parachute, M662.

(3) 1310-B506: Cartridge, 40mm, Red Smoke, M713.

(4) 1310-B508: Cartridge, 40mm, Green Smoke, M715.

(5) 1310-B509: Cartridge, 40mm, Yellow Smoke, M716.

(6) 1310-B519: Cartridge, 40mm, Practice, M781.

(7) 1310-B534: Cartridge, 40mm, Multi Purpose, M576.

(8) 1310-B535: Cartridge, 40mm, White Star Parachute, M583A1.

(9) 1310-B536: Cartridge, 40mm, White Star Cluster, M585.

(10) 1310-B537: Cartridge, 40mm, Chemical Agent, CS, M674.

(11) 1310-B542: Cartridge, 40mm, High Explosive Dual Purpose (HEDP), M430A1.

(12) 1310-B546: Cartridge, 40mm, High Explosive Dual Purpose (HEDP), M433.

(13) 1310-B567: Cartridge, 40mm, Tactical, CS, M651.

(14) 1310-B568: Cartridge, 40mm, HE, M406.

(15) 1310-B569: Cartridge, 40mm, HE, M397A1.

(16) 1310-B571: Cartridge, 40mm, HE, M383.

(17) 1310-B574: Cartridge, 40mm, HE, M386.

(18) 1310-B575: Cartridge, 40mm, HE, M441

(19) 1310-B576: Cartridge, 40mm, Practice, M385A1.

(20) 1310-B584: Cartridge, 40mm, Target Practice, M918.

(21) 1310-BA03: Cartridge, 40mm, Infrared, Illuminant, M992.

(22) 1310-BA06: Cartridge, 40mm, Non-Lethal, M1006.

(23) 1310-BA11: Cartridge, 40mm, Canister, M1001.

(24) 1310-BA12: Cartridge, 40mm, Practice, MK281 MOD0.

(25) 1310-BA13: Cartridge, 40mm, Non-Lethal, Crowd Dispersal, M1029.

(26) 1310-BA30: Cartridge, 40mm, Target Practice, M918 and M385A1, Linked (2:1).

NOTE:

The M386, M397, M406, M433, M441, M576, M583, M585, M651, M661, M662, M713, M715, M716, M781, M992, M1006, and M1029 are low velocity 40mm ammunition and only authorized to be fired from the M203 and M320 40mm Grenade Launchers. The M383, M385A1, M430A1, M918, M1001, MK281 MOD0, and M918/M385A1 Mixed Belt are high velocity 40mm ammunition and only authorized to be fired from the MK19 MOD3 Grenade Machine Gun (GMG). The M674 is a hand-held 40mm ammunition and is not intended to be fired from any weapon system.

b. Cartridge, 40mm, Green Star, Parachute, M661; Cartridge, 40mm, Red Star, Parachute, M662; and Cartridge, 40mm, White Star Parachute, M583A1 are designed for illumination and signaling with less weight and bulk and greater accuracy than comparable hand-held signals. They are fired from the M203 and M320 40mm Grenade Launchers. The weapon firing pin strikes the primer igniting the propelling charge. Gases from the burning propellant expand in the high-pressure chamber. This pressure ruptures the propellant cup, and the pressure escapes through the vent holes into the low-pressure chamber, propelling the projectile forward with the velocity required to reach the burst altitude. The burning propellant also ignites the 5.5-second delay element in the base of the projectile. The rotating band engages the rifling in the launcher tube to impart a spin of 3,750 rpm to the projectile. At the end of the delay, the delay element ignites the ejection charge. The ejection charge ignites the candle and blows the candle assembly out through the top of the projectile body. The attached parachute deploys upon ejection to lower the candle at 7 feet per second. The candle burns for approximately 40 seconds. The candle functions at an altitude of 500 to 700 feet when fired vertically and is visible to an air observer at a slant range of at least 3 miles from 3,000 feet altitude.

c. Cartridge, 40mm, Red Smoke, M713; Cartridge, 40mm, Green Smoke, M715; and Cartridge, 40mm, Yellow Smoke, M716 are ground marking munitions used to provide aerial identification and location of troops on the ground and are designed to be fired from the M203 and M320 40mm Grenade Launchers. The weapon firing pin strikes the primer igniting the propelling charge. In turn, the projectile is accelerated down the launcher barrel where as spin of 3,750 rpm is imparted by the barrel rifling. A muzzle velocity of approximately 350 fps is attained. In addition to launching the projectile, the propellant gases ignite the first fire mixture of the fuze in the base of the projectile. The first fire mixture ignites a high-temperature transfer mixture contained in the steel cup. The transfer mixture burns during the first 15 meters of projectile flight. When the projectile is between 15 and 45 meters from the launcher muzzle, heat transfer through the steel cup ignites the delay mixture. Upon impact, the delay casing breaks and the burning portion flies forward out of the fuze support, contacting and igniting the pyrotechnic

smoke mixture. Ignition of the smoke mixture causes a buildup of pressure which dislodges the fuze support at the aft end of the projectile thus allowing smoke to be emitted at the aft end of the projectile. Projectile impact prior to the minimum arming distance of 15 meters results in a dud. Between 15 and 45 meters from the launcher muzzle, the fuze may or may not function on impact. In the event the fuze fails to function upon impact, the output mixture provided in the front end of the delay casing acts as a backup to the impact feature. When the flame reaches this point (8 to 10 seconds after launch) the output mixture flashes and ignites the smoke mixture.

d. Cartridge, 40mm, Practice, M781 is a fixed, practice type ammunition designed to be fired from the M203 and M320 40mm Grenade Launchers. The weapon firing pin strikes the .38 caliber blank cartridge primer igniting the propelling charge. The burning propellant charge generates sufficient pressure to release the expanding propellant gases through the vent hole into the low-pressure chamber. The rotating band around the projectile engages the rifling in the launcher tube imparting a spin of 3,600 rpm to the projectile. The pressure created by the expanding propellant gases in the low-pressure chamber forces the projectile through the tube with a velocity of 76 meters per second. Upon impact with the target, the frangible ogive ruptures and releases the dye causing a puff of yellow-orange smoke which simulates explosive impact.

e. Cartridge, 40mm, Multi Purpose, M576 is intended for use in counter-insurgency and conventional operations in jungle environments, particularly during periods of poor visibility where personnel targets appear at short distances without warning and are vulnerably exposed only fleetingly. It is designed to be fired from the M203 and M320 40mm Grenade launchers. The weapon firing pin strikes the primer which ignites the propelling charge. Gases from the burning propellant expand in the high-pressure chamber. The pressure ruptures the copper disk allowing the expanding gases to escape through the vent holes into the low-pressure chamber. Continuing gas expansion forces the projectile through the launcher tube. Setback force from cartridge ignition causes the pellet cup in the sabot carrier to move rearward. This movement disengages the cap from the pellet cup. Upon reaching the muzzle, the sabot carrier and pellet cup are discarded allowing the metal pellets free flight to the target.

f. Cartridge, 40mm, White Star Cluster, M585 is designed for illumination and signaling with less weight and built and greater accuracy than comparable hand-held signals. It is designed to be fired from the M203 and M320 40mm Grenade Launchers. The weapon firing pin strikes the primer igniting the propelling charge. Gases from the burning propellant expand in the high-pressure chamber. The pressure ruptures the propellant cup and the gas pressure escapes through the vents into the low-pressure chamber. The expanding gases propel the projectile through the launcher tube with a muzzle velocity of 76 mps and reaches a burst altitude of 550 feet at a quadrant elevation of 85 degrees. The burning propellant also ignites the delay element in the base of the projectile. Within 4 to 5 seconds after firing, the delay element ignites the ejection charge. The ejection charge ignites the star charge and blows the candle assembly out through the top of the projectile body. The individual starts burn for approximately 7 seconds during free fall and produce 55,000 candle power.

g. Cartridge, 40mm, Chemical Agent, CS, M674 is a intended for use against any target vulnerable to CS agent. It is to be hand-held when fired and is not designed to be fired from any weapon system. The primer fires when struck by the firing pin. The black powder ignites, generating propellant gas. The burning black powder in turn ignites the initial pelletized first-fire mixture through a flash hole in the spacer and closure cap. Gas pressure increases in the space between the spacer, cartridge barrel, and primer holder, which forces the body assembly out of the cartridge barrel. The initial first-fire mixture, ignited by the black powder, ignites the second first-fire mixture. The second first-fire mixture in turn ignites the third first-fire mixture. The third first-fire mixture burns through the plastic cup seal and ignites the CS pyrotechnic mixture contained in the body assembly. Increased pressure inside the body assembly bursts one or more of the four emission-hole walls in the neck end of the body assembly and releases smoke produced by the burning CS pyrotechnic mixture. Functioning of the munition will occur from 2 to 7 seconds after firing.

h. Cartridge, 40mm, High Explosive Dual Purpose (HEDP), M430A1 is a high explosive, dual purpose, impact type round designed to penetrate three inches of steel armor at 0 angle of obliquity and inflict personnel casualties in the target area. It is designed to be fired from the MK19 MOD3 40mm Grenade Machine Gun. The weapon firing pin strikes the percussion primer igniting the propelling charge. Pressure, generated by the burning propellant in the high-pressure chamber, forces the expanding gases through the vent holes into the low-pressure chamber, and propels the projectile forward. The rotating band around the projectile engages the rifling in the launcher tube, imparting a spin of 12,000 rpm to the projectile. The expanding gases in the low-pressure chamber force the projectile through the barrel attaining a muzzle velocity of 241 meters per second. Prior to firing, the detonator in the fuze rotor is held out of line by the position of a setback pin against the rotor and gear assembly. Upon firing, setback force frees the rotor from the pin. The spin of the projectile causes the safety spring assembly to disengage from the rotor and gear assembly. The detonator then begins to move toward the armed position under the influence of centrifugal force on the eccentrically located rotor. The movement of the rotor and gear assembly is resisted by an escapement mechanism, providing the required time delay in the arming of the fuze. The detonator reaches the armed position when the projectile has traveled a distance of 18 to 40 meters from the launcher. Upon impact with the target, the firing pin is driven into the detonator. The effect of the detonator initiates the spit-back charge producing a jet which in turn initiates the main charge. Detonation of the main charge provides both the armor piercing effect of the shaped charge and fragmentation of the steel body.

i. Cartridge, 40mm, High Explosive Dual Purpose (HEDP), M433 is a dual purpose impact type round

designed to penetrate at least two inches of steel armor at 0 angle of obliquity and inflict personnel casualties in the target area. It is designed to be fired from the M203 and M320 40mm Grenade Launchers. The weapon firing pin strikes the percussion primer, which ignites the propelling charge. Pressure created by the burning propellant in the high-pressure chamber causes the propellant cup to rupture. The propellant gases escape through vent holes into the low-pressure chamber. The rotating band around the projectile engages the rifling in the launcher tube to impart a spin of 3,750 rpm to the projectile. Expanding gases in the low-pressure chamber force the projectile through the tube with a muzzle velocity of 76 meters per second. After the projectile leaves the launcher tube, initial rotation causes the fuze detent to free the fuze rotor. Centrifugal force causes three hammer weights to move radially outward, allowing a conical spring to move the firing pin forward, disengaging the rotor. Dynamic imbalance of the rotor causes it to rotate to the armed position, aligning the M55 detonator with the firing pin and the spit-back shaped charge. A fuze escapement mechanism retards rotor movement, delaying arming until the projectile has traveled at least 45 feet from the launcher tube. Upon impact with the target, the firing pin is driven into the detonator, triggering the spit-back shaped charge and producing a jet blast which detonated the HE bursting charge. Detonation of the bursting charge forms an armor-piercing jet of molten metal and fragmentation of the projectile body.

j. Cartridge, 40mm, Tactical, CS, M651 is intended for use against any target vulnerable to CS agent. The projectile will penetrate window glass or up to ¾ inch pine wood at 200 meters and release CS after penetrations. The projectile will also function against other materials such as earth, gravel, brush, sandbags, and bamboo. It is designed to be fired from the M203 and M320 40mm Grenade Launchers. When the primer is struck by the firing pin, expanding gases from the propellant burst through the brass cup through the vent holes in the propellant cup into the space behind the driver cup. This causes the driver cup to unroll rapidly as a glove unrolls inside-out. The unrolling forces the projectile forward down the barrel. At the end of the driver cup stroke, the disk in the driver cup blows out to free the gas and flame of the burning propellant. Before firing the fuze rotor is held in the unarmed position by a setback pin and a centrifugal lock. Upon firing, setback force caused the setback pin to free the rotor for movement. The projectile rotation in flight causes continued centrifugal force that releases the centrifugal lock. The fuze is then armed by the release of an escapement mechanism that delays rotor motion to the armed position until the projectile has traveled 10 meters from the launcher. Between 10 and 30 meters, the rotor moves into the armed position and carries the detonator into line with the firing pin and the ignition train. Upon impact at any angle between 0 and 85 degrees, inertial forces cause the firing pin to strike the detonator. Then another percussion primer is ignited which in turn ignites the ignition mixture, the first-fire mixture and the CS-pyrotechnic mixture. Pressure developed by the burning CS-pyrotechnic mixture forces the plug out of the vent hole in the base of the projectile to release the CS. Burning (approximately 25 seconds) is accompanied by a hissing sound and a dense white cloud of CS.

k. Cartridge, 40mm, HE, M406 is a high explosive round designed to inflict personnel casualties using ground burst effect. It is designed to be fired from the M203 and M320 40mm Grenade Launchers. The weapon firing pin strikes the percussion primer igniting the propelling charge in the high-pressure chamber. The burning propelling charge generates sufficient pressure to rupture the propelling cup forcing the expanding gases through the vent holes into the low-pressure chamber. The rotating band around the projectile engages the rifling in the launcher tube imparting a spin of 3,600 rpm to the projectile. The pressure created by the expanding propellant gasses in the low-pressure chamber force the projectile through the tube with a muzzle velocity of 76 meters per second. When the projectile is fired, setback forces cause the fuze setback pin to retract from the fuze rotor. The rotor is held in an unarmed position by a firing pin, a centrifugal lock, and the setback pin in the fuze assembly. Centrifugal force, generated by the rotation of the projectile, causes the three pivoted inertia weights and the centrifugal lock in the fuze to move outward. In turn, the spring loaded firing pin and the lock retract from the rotor and fuze gear train, respectively. The rotor, now free to rotate, lines up the fuze detonator with the explosive train. A fuze escapement mechanism delays arming by controlling rotor movement. The fuze arms after the projectile has traveled at least 14 meters from the launcher tube. Upon impact with the target, the firing pin is forced into the detonator. Concurrently the detonator triggers the booster charge, in turn, detonating the high explosive bursting charge, which produces a blast and fragmentation of the projectile body. The projectile body is wire wrapped so that fragmentation is more uniform on impact.

l. Cartridge, 40mm, HE, M397A1 is a high explosive round designed to inflict personnel casualties using airburst effect. It is designed to be fired from the M203 and M320 40mm Grenade Launchers. The weapon firing pin strikes the percussion primer igniting the propelling charge in the high-pressure chamber. The burning propelling charge generates sufficient pressure to rupture the propellant cup forcing the expanding gases from the burning propellant through the vent holes in the low-pressure chamber. The rotating band around the projectile engages the rifling in the launcher tube, imparting spin to the projectile. The pressure, created by the expanding propellant gases in the low-pressure chamber, forces the projectile through the tube with a muzzle velocity of 76 meters per second. When the projectile is fired, setback forces cause the fuze setback pin to retract from the fuze rotor causing the Bellville type washer to be crushed. This permits the fuze housing assembly containing the rotor to retract from the stationary fuze firing pin. In the unarmed position, a setback pin, a firing pin, and a centrifugal lock in the fuze assembly, combine to prevent movement of the rotor. This keeps the fuze detonator from aligning with the separate charge assembly. Centrifugal force, from rotation of the projectile, causes the centrifugal lock to retract from the fuze gear train. The rotor, now free to rotate, lines up the detonator with the separation charge assembly. A fuze escapement mechanism delays arming by controlling

rotor movement. The fuze arms after the projectile has traveled at least 14 meters from the launcher tube. Upon impact with the target, the M55 detonator within the setback sleeve and housing assembly is driven forward into the firing pin. In turn, the detonator ignites the separation charge assembly which initiates the delay detonator of the auxiliary fuze in the ball assembly. Gas pressure drives the delay detonator into the armed position. Concurrently, the ball assembly with the auxiliary fuze ejects from the rear of the projectile into the air. The pyrotechnic delay detonates the booster charge, in turn, detonating the bursting charge 80 milliseconds after ejection. This results in a blast and fragmentation of the ball assembly 5 feet above the impact point.

m. Cartridge, 40mm, HE, M383 is a high explosive round designed to inflict personnel casualties in the target area using ground burst effect. It is designed to be fired from the MK19 MOD3 40mm Grenade Machine Gun. The weapon firing pin strikes the percussion primer igniting the propelling charge. Pressure generated by the burning propellant in the high-pressure chamber, forces the expanding gases through the vent holes into the low-pressure chamber and propels the projectile forward. The rotating band around the projectile engages the rifling in the launcher barrel imparting a spin of 12,000 rpm to the projectile. The expanding gasses in the low-pressure chamber force the projectile through the barrel with a muzzle velocity of 244 meters per second. After the projectile leaves the launcher tube, setback forces cause the fuze setback pin, which keeps the rotor out of line with the detonator, to be disengaged from the rotor. The rotor is secured in position by a centrifugal lock which engages the star wheel in the timing mechanism of the fuze assembly. The centrifugal lock releases the star wheel and arming of the fuze begins when the projectile attains sufficient spin. The rotor springs start rotation of the rotor which is sustained by centrifugal force. The escapement assembly delays arming of the fuze for approximately 0.07 to 0.16 seconds. The rotor is then locked in the armed position, and the fuze is armed at approximately 18 to 36 meters from the launcher tube. Upon graze or impact with the target, the inertial force from impact causes bracket weights to pivot inward forcing the firing pin into the detonator. Concurrently, the detonator detonates the explosive charge causing a blast and fragmentation of the projectile body.

n. Cartridge, 40mm, HE, M386 is a high explosive round designed to inflict personnel casualties from ground burst effect. It is designed to be fired from the M203 and M320 40mm Grenade Launchers. The weapon firing pin strikes the percussion primer igniting the propelling charge in the high-pressure chamber. The burning propelling charge generates sufficient pressure to rupture the propellant cup and force the exploding gases through the vent holes into the low-pressure chamber. The rotating band around the projectile engages the rifling in the launcher tube imparting spin to the projectile. The pressure created by the expanding propellant gases in the low-pressure chamber forces the projectile through the tube with a muzzle velocity of 76 meters per second. After the projectile leaves the launcher tube, setback causes a fuze setback pin to move rearward and clear the fuze rotor which is held in an unarmed position by a firing pin, centrifugal lock, and the setback pin in the fuze assembly. Centrifugal force, generated by the rotation in the projectile, causes three pivoted inertial weights and the fuze centrifugal lock to move outward. This action causes the spring loaded firing pin and lock to retract from the rotor and gear train, respectively. The rotor, now free to rotate, aligns the fuze detonator with the explosive train. A fuze escapement mechanism delays arming by controlling rotor movement. The fuze arms after the projectile has traveled at least 14 meters from the launcher tube. Upon impact with the target, the firing pin is forced into the detonator. The detonator triggers the booster charge, in turn, detonating the high-explosive bursting charge, producing a blast and fragmentation of the projectile body.

o. Cartridge, 40mm, HE, M441 is a high explosive round designed to inflict personnel casualties using ground burst effect. It is designed to be fired from the M203 and M320 40mm Grenade Launchers. The weapon firing pin strikes the primer igniting the propelling charge. Gases from the burning propellant expand in the high-pressure chamber. This pressure ruptures the propellant cup, forcing the gases to escape through the vents into the low-pressure chamber. The rotating band around the projectile engages the rifling in the launcher tube imparting spin to the projectile. Expanding gases in the low-pressure tube with a muzzle velocity of 76 meters per second. At the time of firing, setback causes the firing pin to be withdrawn from the fuze rotor detent. Prior to this action, the detonator in the rotor is held out of line with the explosive train. With the rotor free, centrifugal force causes the rotor ball to turn and align the detonator with the firing pin. The fuze arms after the projectile has traveled approximately 2 to 4 meters from the launcher tube. Upon graze or impact, inertia throws the inertial ring forward against the push pins. The push pins pivot the levers inward to drive the firing pin into the detonator. The detonator initiates the booster to detonate the high explosive charge resulting in blast and fragmentation of the projectile body.

p. Cartridge, 40mm, Practice, M385A1 is designed only for practice or proof testing weapons. It is designed to be fired from the MK19 MOD3 40mm Grenade Machine Gun. The weapon firing pin strikes the percussion primer to ignite the propelling charge. The expanding gases from the burning propellant are forced from the high-pressure chamber, through vent holes into the low-pressure chamber. The rotating band around the projectile engages the rifling in the launcher tube imparting a spin of 12,000 rpm to the projectile. The expanding gases in the low-pressure chamber force the projectile through the tube with a muzzle velocity of 242 meters per second. Because it is inert, the projectile does not function upon impact with the target.

q. Cartridge, 40mm, Target Practice, M918 is a target practice round designed to simulate the M430(A1) cartridge in appearance and ballistics. It is designed to be fired from the MK19 MOD3 40mm Grenade Machine Gun. The weapon firing pin strikes the percussion primer igniting the propelling charge. Pressure generated by the burning propellant in the high-pressure chamber, forces the expanding gases through the vent holes into the low-pressure chamber

and propels the projectile forward. The rotating band around the projectile engages the rifling in the launcher tube imparting a spin of 12,000 rpm to the projectile. The expanding gases in the low-pressure chamber force the projectile through the barrel with a velocity of 242 meters per second. When the projectile is fired, setback force causes the fuze setback pin to move rearward from the fuze rotor. The rotor is held out of line with the fuze detonator by the setback pin and fuze centrifugal lock which engages the gear teeth of the fuze rotor. When the projectile attains sufficient spin, the centrifugal lock releases the rotor and arming begins. The rotor begins rotation toward the center of the projectile. The rotor gear engaged with the pinion shaft delays arming of the fuze. After the projectile has traveled 18 to 30 meters from the launcher tube, the rotor is locked in the armed position and the fuze is armed. Upon impact with the target, the entire escapement moves forward compressing the rubber hose and driving the detonator into the firing pin, which in turn flashes through the small hole of the body insert and ignites the flash powder. Gases generated by the burning powder are concentrated upon the base of the projectile body causing it to rupture and producing a flash, smoke, and a loud report. Rupture begins at the very center of the projectile base forming hinged petals.

r. Cartridge, 40mm, Infrared, Illuminant, M992 is an infrared illuminant cartridge to enhance night visibility while using night vision devices. It is designed to be fired from the M203 and M320 40mm Grenade Launchers. The weapon firing pin strikes the primer igniting the propelling charge. Gases from the burning propellant expand in the high-pressure chamber. This pressure ruptures the propellant cup, and the pressure escapes through the vent holes into the low-pressure chamber, propelling the projectile forward with the velocity required to reach the burst altitude. The burning propellant also ignites the 5-second delay element in the base of the projectile. The rotating band engages the rifling in the launcher tube to impart a spin of 3,750 rpm to the projectile. At the end of the delay, the delay element ignites the ejection charge. The ejection charge ignites the candle and blows the candle assembly out through the top of the projectile body. The attaché parachute deploys upon ejection for approximately 40 seconds. The candle functions at an altitude of 500 to 700 feet when fired vertically.

s. Cartridge, 40mm, Non-Lethal, M1006 is used to incapacitate personnel without penetrating the person's body. It is used for riot control, policing, and peace keeping situations. It is designed to be fired from the M203 and M320 40mm Grenade Launchers. The weapon firing pin strikes the primer igniting the propelling charge. The burning propelling charge generates sufficient pressure to release the expanding propellant gases through the vent holes into the low-pressure chamber. The rotating band around the projectile engages the rifling in the launcher tube imparting a spin of 3,600 rpm to the projectile. The pressure, created by the expanding gases in the low-pressure chamber, forces the projectile through the tube with a velocity of 265 feet per second. Upon impact with an individual, force is generated to incapacitate without causing a fatality.

t. Cartridge, 40mm, Canister, M1001 is used against personnel out to 100 meters from the weapon It is designed to be fired from the MK19 MOD3 40mm Grenade Machine Gun. The weapon firing pin strikes the percussion primer igniting the propelling charge. Pressure generated by the burning propellant in the high-pressure chamber, forces the expanding gases through the vent holes into the low-pressure chamber and propels the projectile forward. Propellant gas is bled into the base of the canister projectile through a hole in the bottom of the sabot body. The force of the gas acting on the valve plate pushes it forward against a spring and opens the plenum chamber. Propelling gas ignites the expulsion charge located in the plenum chamber, and expulsion charge gas pushes the valve plate closed and pushes the pusher cup forward. The pusher cup is loaded with 107 flechettes. The forward motion of the pusher cup and the flechettes releases the nosecap. Once the nosecap is released, the pusher cup and flechettes are free to deploy.

u. Cartridge, 40mm, Practice, MK281 MOD0 is a high velocity 40mm training round that utilizes an inert powdered dye marker to indicate the point of target hit. It is designed to be fired from the MK19 MOD3 40mm Grenade Machine Gun. The weapon firing pin strikes the percussion primer igniting the propelling charge. Pressure generated by the burning propellant in the high-pressure chamber, forces the expanding gases through the vent holes into the low-pressure chamber and propels the projectile forward. The steel high-pressure chamber which is threaded into the aluminum cartridge case is also threaded to the steel projectile by a shaft. This threaded shaft has a specified tensile breaking point for consistent projectile extraction force yielding greater accuracy. Upon target impact, the plastic ogive breaks, marking the target with bright orange dye.

v. Cartridge, 40mm, Non-Lethal, Crowd Dispersal, M1029 is used to incapacitate personnel without any penetrations to the individual's body. It is used for riot control, policing, and peace keeping situations. It is designed to be fired from the M203 and M320 40mm Grenade Launchers. When the primer is struck by the firing pin, expanding gases from the propellant push against the gas seal. This causes the fiberboard sleeve to push the upper wad down the muzzle and expel the rubber balls.

w. Cartridge, 40mm, Target Practice, M918 and M385A1, Linked (2:1) is a training ammunition created to lower the cost of training when compared to training strictly with the M385A1 ammunition. It is designed to be fired from the MK19 MOD3 40mm Grenade Machine Gun. The rounds are linked with two rounds of M918 followed by 1 round of M385A1, and repeated throughout the 32 round belt of ammunition. The M918 and M385A1 behave as described in (q) and (p), respectively.

AN-2. Unique Safety Precautions.

a. Reasonable care will be taken during inspection and handling. 40mm ammunition may function if primer is inadvertently struck.

b. To preclude the mixing and use of various 40mm ammunition, the following minimum precautions will be taken:

(1) Conduct no operations involving the

combining of high velocity and low velocity 40mm ammunition. Although it may fit in its counterparts weapon, each ammunition type was designed only for its approved weapon system.

(2) Inspect all equipment and work areas prior to use to insure only the proper ammunition is present.

(3) Restrict the use of additional 40mm ammunition on a weapon until all operations with prior 40mm ammunition is completed.

(4) Incorporate controls on linking machines that will prevent linking of any 40mm low velocity ammunition.

(5) Conduct a 100-percent visual inspection of all rounds prior to linking and packing and another 100-percent inspection before final packing to insure that only the designated 40mm ammunition is packed in the ammunition canister and lot integrity in maintained.

(6) High velocity ammunition is not to be delinked, or relinked, unless outfitted with the proper gold colored coupling. When the coupling is available and ammunition in combined, lot integrity must be kept at all times.

(7) Personnel should not carry any unauthorized wireless/electric devices when performing uploading, downloading, and pre-firing operations.

(8) Adhere to all safety warnings, cautions, and notes as called out in references listed in paragraph AN-7.

AN-3. Testing and Equipment Requirements.

None applicable.

AN-4. Inspection Category and Sampling Plan.

Inspection intervals will be set IAW the Conventional Ammunition Inspection Interval Listing (paragraph 1-5d(21)g) and sampling plans IAW Chapter 2.

AN-5. Specific Inspection Points.

Items will be inspected and classified according to the appropriate paragraphs of Chapter 2 and Table AN-1.

AN-6. Additional Guidance for 40mm Ammunition.

a. All 40mm ammunition with lost lot integrity will be picked up to accountable records in condition code K pending inspection and classification.

b. Ammunition determined by inspection to be serviceable, with identifiable lot number, will be assigned appropriate condition code. Ammunition determined by inspection to be unserviceable, with or without identifiable lot number, will be assigned appropriate condition code and reported through command channels to the commodity command.

AN-7. References.

a. TM 9-1010-221-10.

b. TM 9-1010-230-10.

c. TM 9-1010-230-23&P.

d. TM 9-1010-232-10.

e. TM 9-1010-232-23&P.

f. TM 9-1300-251-20&P.

g. TM 9-1300-251-34&P.

h. TM 43-0001-28.

Table AN-1. Item Defects and Method of Inspection.			
Classification	Application	Inspection Method	Inspection Description
1. Critical:			
Presence of a crack on skirt.	M433	Visual	
2. Major:			
a. Projectile/body marking unidentifiable, missing, improperly placed.	All	Visual	
b. Incorrect projectile color.	All	Visual	
c. Primer damaged.	All	Visual	
d. Cartridge case metal defects	All	Visual	
e. Windshield loose.	M781	Manual	
f. Projectile assembly loose.	All	Visual	
g. Missing or improperly placed groove.	M383, M385A1, M430A1, M918, M1001 and MK281 MOD0	Visual	
h. Presence of cracks on body.	All rounds except M433	Visual	
i. Excessive varnish/sealing compound on exterior surface of primer.	M383, M385A1, M430A1, M918, M1001 and MK281 MOD0	Visual	
j. Link improperly assembled (any of the four (4) link tabs not in groove, link inverted, link damaged, link distorted).	M383, M385A1, M430A1, M918, M1001 and MK281 MOD0	Visual	
k. Cartridge inverted in belt of ammunition.	M383, M385A1, M430A1, M918, M1001, and MK281 MOD0	Visual	
l. Improper body/cartridge case crimp.	All	Visual	
m. O-ring exposed.	M383, M385A1, M430A1, M918, M1001, and MK281 MOD0	Visual	
n. Loose fuze.	M430A1, M433, M918	Manual	
3. Minor:			
a. Evidence of poor workmanship.	All	Visual	
b. Cartridge case marking misleading or unidentifiable.	All	Visual	
c. Improper finish on base plug.	All	Visual	
d. Color incorrect on base plug.	All	Visual	
e. Cartridge case, base plug with protective coating bare spot(s).	All	Visual	
f. Excessive varnish/sealing compound on exterior surface of primer.	M386, M397, M406, M433, M441, M576, M583, M585, M651, M661, M662, M713, M715, M716, M781, M992, M1006 and M1029	Visual	

APPENDIX AO
CARTRIDGE, NON-LETHAL FIRING DEVICE: TASER, XP25

AO-1. Item Description.

a. FSC: 1375.

b. Ammunition Type: Cartridge, DODIC: JN17.

c. The XP25 (Extra Penetration – XP, 25 feet) TASER Cartridge is the standard ammunition used with the X26E TASER system. It is connected to the X26E TASER and is used to launch and attach two 25 feet long probes to the target, which allows for an electrical current to be emitted through the attached wires, which will incapacitate the target.

d. The XP25 TASER Cartridge is a black, plastic-housed cartridge used as part of the X26E TASER system, a non-lethal pulsed-energy firing device used to make the subject incapable of movement. It has green blast doors and comes packaged with a clear plastic cartridge clip that covers the blast doors for safety purposes. When used with the X26E TASER, electrical pulses are delivered to the subject, which override the sensory and motor nervous system, causing neuromuscular incapacitation of the subject.

e. The XP25 TASER cartridge, which loads on the front of the TASER X26E, uses compressed nitrogen to launch two barbed probes attached to an insulated wire toward the subject. At the same time, numerous Anti-Felon Identification Tags (AFIDs) contained in each cartridge are dispersed.

f. The XP25 cartridge has a shelf life of 5 years from date of manufacture. Expiration dates (month and year) are printed on the label of each cartridge for early production items and is the date that the shelf life expires. After the initial 5 year shelf life expires, serviceable cartridges will be extended for an additional 5 years and restricted to training use only. For early production cartridges, the lot number may not match up with the date the cartridge was manufactured, and the lot number may not appear on the cartridge label.

g. DoD Hazard Class/Div: NOT REGULATED (only valid when the protective plastic clips are installed to prevent deployment of the barbed tip electrodes during transport).

h. Storage Compatibility Group: S.

AO-2. Unique Safety Precautions.

a. Do not store the Cartridge in direct sunlight. Extended exposure can cause the temperature to rise above the maximum permissible temperature of +122 degree F (+50 deg C), and cause cartridge blow-out when firing, resulting in erratic probe launching. Serious injury to personnel may occur.

b. Prior to handling the XP25 TASER cartridges, personnel must ground themselves by touching a ground point to prevent erratic probe launching from electrostatic discharge. Serious injury to personnel may occur.

c. Dispose of contaminated probes using local SOP for biohazardous material. Always assume biological substances are present and can permanently harm the user upon mishandling and exposure to the biological substance.

d. Do not tamper with any XP25 cartridge. The probes may erratically launch, causing serious injury to personnel. Never point an XP25 cartridge at eyes or face. Always keep hands and body parts away from the front of the XP25 cartridges. Probes may launch if they are struck sharply or receive an electrical shock.

e. Do not handle XP25 cartridges with the blast doors in the palm of hand. Always handle XP25 cartridge from the rear and sides. Probes may launch if XP25 cartridge receives an electrostatic shock. Serious injury to personnel may occur.

f. If blast doors become detached from the XP25 cartridge, discard the XP25 cartridge IAW local SOP. Do not attempt to reattach blast doors, as an external static discharge may cause the probes to launch, seriously injuring personnel.

g. The plastic cartridge clip is the sole safety article for this item and should only be removed prior to use. Cartridge Clip should be reattached by X26E TASER operator prior to return if cartridge is unfired. For safety purposes, if a clip is missing and no spares are available, use the following field expedient methods for handling the TASER cartridge:

(1) Handle cartridge with the green blast doors facing away from personnel.

(2) Using an empty wood box, face cartridge into wood box with blast doors facing downward on the wood.

(3) Store cartridges in this fashion until replacement cartridge clips are obtained.

AO-3. Inspection Category and Sampling Plan.

a. Inspection category W; Periodic Inspection Interval - 5 years.

b. Sampling plan and accept/reject criteria for inspection is IAW Chapter 2.

c. Item will be inspected and classified IAW this appendix.

AO-4. Specific Inspection Points. See Table AO-1.

AO-5. Inspection Description.

a. Electrostatic barrier bags are considered hermetically sealed and will not be opened solely for inspection purposes, unless damage to the interior items is suspected (e.g. soft or crushed interior fiberboard box, etc.).

b. DSR inspection results will include the shelf life expiration date.

AO-6. References.

a. TM 9-1095-213-13&P.

b. TM 9-1377-200-20.

Table AO-1. Item Defects and Method of Inspection			
Classification	Application	Inspection Method	Inspection Description
1. Critical:			
None Identified.			
2. Major:			
a. Cartridge exterior plastic case missing blast doors, missing securing tabs, cracked, and/or bulged.		Visual	
b. Cartridge clip with cracks and/or bulges preventing clip from holding itself over the cartridge blast doors.		Visual	Para AO-2g
3. Minor:			
a. Foam support (inside the fiberboard box) with large holes or tears.		Visual	Replace if unable to secure cartridges.
b. Cartridge label missing and/or with illegible and/or expired Month/Year (MM/YY) shelf life date.		Visual	Appendix D of TB 9-1300-385, and Para AO-1f
c. Electrostatic Discharge (ESD) Bag not sealed (including tears and/or cuts); evidence of moisture in ESD bag.		Visual	Replace the ESD Bag.
d. Defective inner pack (Fiber Box).		Visual	Para 3-8 of TM 9-1377-200-20.
e. Defective outer pack (Wood Box).		Visual	Para 3-8 of TM 9-1377-200-20.
f. Defective Pallet & Strapping.		Visual	Para 3-8 of TM 9-1377-200-20.

APPENDIX AP
CHARGES, DEMOLITION, SHAPED, 15 LB. AND 40 LB.

AP-1. Item Description.

a. FSC: 1375.

b. Ammunition Type:

(1) Charge, Demolition, Shaped, 15 lb. M2A3/M2A4.

(2) Charge, Demolition, Shaped, 40 lb. M3/M3A1.

c. Charge, Demolition, Shaped, 15 lb. M2A3/ M2A4 and Charge, Demolition, Shaped, 40 lb. M3/ M3A1 are known as the 15 lb Shaped Charge and 40 lb Shaped Charge. The shaped charges are primarily used for burring holes in earth, metal, concrete, and paved or unpaved roads. The shaped charges contain Composition B explosive with a Composition A-5 booster in either a fiberglass or metal container with a stand-off to allow proper jet formation. The shaped charges are placed on the stand-off with the conical section pointing down. The shaped charges are initiated by standard military initiating devices such as the M6 electric blasting cap, M7 non-electric blasting cap, or Modern Demolition Initiators (MDI) family (M14, M15, etc.) at a safe distance IAW the Surface Danger Zone (SDZ).

d. A summary of the shaped charge NSNs is contained in Table AP-1.

AP-2. Unique Safety Precautions.

a. All personnel must stay outside of the SDZ during operation.

b. Always wear proper safety equipment.

c. Assure that shaped charge is intact.

AP-3. Testing and Equipment Requirements.

None applicable for Surveillance inspection. ASRP tests will be conducted under the CCFTP program.

AP-4. Inspection Category and Sampling Plan.

a. Inspection category Y; Periodic Inspection Interval - 3 years.

b. Sampling plan, accept/reject criteria and classification is IAW Chapter 2.

c. Item will be inspected IAW this appendix, Table AP-2 and Table AP-3.

AP-5. Inspection Description and Notes.

a. M2 Series Shape Charge barrier bags shall be removed during inspection with all barrier bags being resealed upon completion of inspection.

b. The main explosive used in the shaped charges varies in color from yellow to brown. Red primer paint is used on the underside of the closing caps and on the M2 Series Shape Charge glass liner.

AP-6. References.

a. DMWR 9-1375-M420-X1.

b. DMWR 9-1375-M421-X1.

c. FM 3-34.214.

d. TM 9-1375-213-12.

e. TM 9-1375-213-34&P.

Table AP-1. Item Description					
DODIC	**NSN**	**Model**	**Explosive**	**Item Color**	**Packaging**
M420	1375-00-028-5237	M2A3	2.1 lb of 50/50 Pentolite booster with 9.4 lb of Comp B	Olive Drab with White Markings and Yellow Markings	3 Charges per Barrier Bag, 1 Barrier Bag per Wood Box (20 Wood Box per Pallet)
M420	1375-00-935-1924	M2A3	2.1 lb of 50/50 Pentolite booster with 9.4 lb of Comp B	Olive Drab with White Markings and Yellow Markings	3 Charges per Barrier Bag, 1 Barrier Bag per Wood Box (20 Wood Box per Pallet)
M420	1375-00-529-7698	M2A3	2.1 lb of 50/50 Pentolite booster with 9.4 lb of Comp B	Olive Drab with White Markings and Yellow Markings	3 Charges per Barrier Bag, 1 Barrier Bag per Wood Box (20 Wood Box per Pallet)
M420	1375-00-926-3939	M2A4	0.1 lb of Comp A3 booster with 10 lb of Comp B	Olive Drab with White Markings and Yellow Markings	3 Charges per Barrier Bag, 1 Barrier Bag per Wood Box (20 Wood Box per Pallet)
M420	1375-01-023-7994	M2A4	0.10 lb of Comp A3 booster with 10 lb of Comp B.	Olive Drab with White Markings and Yellow Markings	1 Charge per Carton, 1 Carton per Barrier Bag, 4 Barrier bags per Wood Box (8 Wood Box per Pallet)
M421	1375-00-028-5241	M3	1.7 lb of 50/50 Pentolite booster with 27.3 lb of Comp B	Olive Drab with White Markings and Yellow Markings	One Charge and One Standoff Frame per Wood Box (24 Wood Boxes per Pallet)
M421	1375-00-088-6691	M3A1	0.10 lb of Comp A3 booster with 30.5 lb of Comp B	Olive Drab with White Markings and Yellow Markings	One Charge and One Standoff Frame per Wood Box (24 Wood Boxes per Pallet)

Table AP-2. Item Defects and Method of Inspection for M2 Series Shape Charge			
Classification	Application	Inspection Method	Inspection Description
1. Critical:			
None Identified.			
2. Major:			
a. Debris in detonator well.	All	Visual	
b. Closing cap assembly cracked/split.	All	Visual	
c. Glass cone cracked/chipped.	All	Visual	
d. Shaped charge body cracked/split.	All	Visual	
e. Standoff sleeve cracked/split.	All	Visual	
f. Barrier bag missing.		Visual	
3. Minor:			
a. Marking incomplete or missing on wirebound box or barrier bags.	All	Visual	Para AP-5a
b. Minor rust/corrosion.	All	Visual	
c. Minor paint chips, scratches, etc.	All	Visual	
d. Markings incorrect or missing on shaped charge.	All	Visual	
e. Carrying strap broken, frayed, moldy, or unusable.	All	Visual	

Table AP-3. Item Defects and Method of Inspection for M3 Series Shape Charge			
Classification	Application	Inspection Method	Inspection Description
1. Critical:			
None Identified.			
2. Major:			
a. Debris in detonator well.	All	Visual	
b. Closing cap assembly cracked/split.	All	Visual	
c. Metal cone cracked/dented.	All	Visual	
d. Shaped charge body cracked/dented.	All	Visual	
e. Standoff frame assembly bent/unusable/ missing.	All	Visual	
3. Minor:			
a. Marking incomplete or missing on wirebound box.	All	Visual	
b. Minor rust/corrosion.	All	Visual	
c. Minor paint chips, scratches, etc.	All	Visual	
d. Markings incorrect or missing on shaped charge.	All	Visual	
e. Carrying strap broken, frayed, moldy, or unusable.	All	Visual	

ABBREVIATIONS

AADCS automated ammunition data card system
AAP Army ammunition plant
ACALA Armament Chemical and Ammunition Logistics Activity
ADC ammunition data card
AEL airborne exposure limit
AI acceptance inspection
AIC ammunition identification code
AMCOM U.S. Army Missile Command
AMDF Army management data file
AMSAA Army Materiel Systems Analysis Activity
APDS-T armor piercing discarding sabot - tracer
APE ammunition peculiar equipment
APF afloat prepositioned force
AQL acceptable quality level
AR Army regulation
ARNG U.S. Army National Guard
ASIS ammunition surveillance information system
ASP ammunition supply point
ASRP ammunition stockpile reliability program
ASTP ammunition surveillance test procedures
BLI basic load inspection
BB base bleed
BTR ballistic test request
CAD cartridge actuated devices
CAMDS chemical agent munitions disposal system
CBDCOM U.S. Army Chemical, Biological Defense Command
CC condition code
CCFTP centralized control function test program
CFA controlled firing area
CFR code of federal regulation
CONUS continental United States
COR contracting officer representative
CSDP chemical stockpile disposal plant
CTTP centralized trace test program
DA Department of Army
DAC Department of Army civilian
DAMWO Department of Army modification work order
DISREP discrepancy report
DMWR depot maintenance work requirement
DODAC Department of Defense ammunition code
DODIC Department of Defense identification code
DOT Department of Transportation
DRMO Defense Reutilization Marketing Office
DSR depot surveillance record (DA Form 3022-R), automated version in MHP, or other authorized format
DU depleted uranium
EMR electromagnetic radiation
EOD explosive ordnance disposal
ET electronic time
FAA Federal Aviation Administration
FC functional code
FMS foreign military sales
FORSCOM U.S. Army Forces Command
FSC federal supply class
FSC Field Support Command
FY fiscal year
GFM government furnished material
GRA grant aid
HE high explosive
HEAT high explosive antitank
HEI-T high explosive incendiary - tracer
ICM improved conventional munitions
ILLUM illuminating
JMC, U.S. Army Joint Munitions Command
IR infrared
IRI initial receipt inspection
LAP load, assembly, and pack
LCC logistics control code
LCSRP large caliber stockpile reliability program
LOA letter of offer and acceptance
LSFFAR low spin, folding fin aircraft rockets
MACOM major command
MHP munitions history program
MIMEX major items in long supply and excess
MOS military occupational specialty
MPCG man portable chamber gage
MPS maritime prepositioning ships
MPSM multipurpose submunitions
MRO materiel release order
MSC major subordinate command
MT mechanical time
MTSQ mechanical time super quick
MWO modification work order
NDI nondevelopmental item
NICP national inventory control point
NOSIH Naval Ordnance Station, Indian Head
NSN national stock number
OCONUS outside the continental United States
OPA ogive protector
P&P packing and preservation
PAD propellant actuated device
Para paragraph
PCP pentachlorophenol
PD point detonating
PENTA pentachlorophenol
PFF pre formed fragmentation
PG proving ground
PI periodic inspection
PII pre-issue inspection
PMCD program manager for chemical demilitarization
PMCSD project manager for chemical stockpile disposal
PMNSCM project manager for non-stockpile chemical materiel
PPWR prepositioned war reserve
PREPO, AFLOAT Army prepositioned stocks, afloat
QA/QC quality assurance/quality control
QASAS in-charge senior QASAS at an installation
QASAS quality assurance specialist (ammunition surveillance)
RAAMS remote anti-armor mine system
RCRA resource conservation recoverability act
RCS requirement control symbol
RDD required delivery date
REPSHIP report of shipment
RI receipt inspection
ROD report of discrepancy
RRDA resource recovery and disposition account
SA security assistance
SAA small arms ammunition
SAC security assistance coordinators
SB supply bulletin
SCSRP small caliber stockpile reliability program
SDS standard depot system
SFC sergeant first class
SFTI surveillance function test inspection
SI special inspection
SIMU suspended from issue, movement, and use
SIS safety in storage
SLTP stockpile laboratory test program

SMCA single manager for conventional ammunition
SMI storage monitoring inspection
SOP standing operating procedure
SPI special inspection
SPW shipping planning worksheet
SSG staff sergeant
SSI special surveillance instructions
SSWAFAR spin stabilized, wrap around fin aircraft rockets
STL surveillance test lot
SUPLECAM surveillance program lethal chemical agents and munitions
TAMMC Theater Army Materiel Management Center
TB technical bulletin
TCM toxic chemical munitions
TM technical manual
TMDE test, measurement, and diagnostic equipment
TP-T target practice - tracer
TRADOC U.S. Army Training and Doctrine Command
TWA time weighted average
UNO United Nations organization
USAMC U.S. Army Materiel Command
VI visual inspection
VT variable time
WARP worldwide ammunition reporting program
WARS worldwide ammunition inspection and lot number report, part III
WP white phosphorus
WQEC Navy Weapons Quality Evaluation Center

By Order of the Secretary of the Army:

GEORGE W. CASEY, JR.
General, United States Army
Chief of Staff

Official:



JOYCE E. MORROW
Administrative Assistant to the
Secretary of the Army
0823301

Distribution:

To be distributed in accordance with the initial distribution number (IDN) 990003, requirements for SB 742-1

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is OAASA	Use Part II *(reverse)* for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE
TO: *(Forward to proponent of publication or form) (Include ZIP Code)*	**FROM:** *(Activity and location) (Include ZIP Code)*	

PART I - ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER	DATE	TITLE

ITEM	PAGE	PARA-GRAPH	LINE	FIGURE NO.	TABLE	RECOMMENDED CHANGES AND REASON

* *Reference to line numbers within the paragraph or subparagraph.*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

TO: *(Forward direct to addressee listed in publication)*	**FROM:** *(Activity and location) (Include ZIP Code)*	**DATE**

PART II - REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION NUMBER	DATE	TITLE

PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION

PART III - REMARKS *(Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

PIN: 085373-000

Department of the Army
Pamphlet 700–16

LOGISTICS

THE ARMY AMMUNITION MANAGEMENT SYSTEM

Headquarters
Department of the Army
Washington, DC
1 December 1982

UNCLASSIFIED

SUMMARY of CHANGE

DA PAM 700–16
THE ARMY AMMUNITION MANAGEMENT SYSTEM

Not applicable.

o

o

Headquarters
Department of the Army
Washington, DC
1 December 1982

***Department of the Army Pamphlet 700–16**

LOGISTICS

THE ARMY AMMUNITION MANAGEMENT SYSTEM

By Order of the Secretary of the Army:

E. C. MEYER
General, United States Army
Chief of Staff

Official:

ROBERT M. JOYCE
Major General, United States Army
The Adjutant General

History. This publication has been organized to make it compatible with the Army electronic publishing database. No content has been changed.

Summary. This publication provides a system description for management of the ammunition program by the Department of the Army. It is intended to be a relatively stable document; however, revisions will be published as required for accuracy and currency. As a companion document, the Army Ammunition Plan will be published during the third quarter of the fiscal year to provide composite information which reflects the fiscal support for ammunition in the POM process. The Army Ammunition Plan will reflect the time-oriented planning of the DA Staff and major Army commands for achieving the Army goals in ammunition development, production, procurement, storage, maintenance, supply, and distribution.

Applicability. This document is the system description directed by the Chief of Staff. It is intended to furnish a qualitative conceptual framework for integration of all Department of the Army activities in support of providing ammunition to United States operational forces and foreign military forces under security assistance programs. This includes ammunition research, development, and acquisition; distribution, storage, and maintenance; and ammunition production base readiness, modernization, and expansion.

Proponent and exception authority. The proponent agency of this pamphlet is the Office of the Deputy Chief of Staff for Research, Development, and Acquisition.

Interim changes. Users of this pamphlet will not implement interim changes unless the change document has been authenticated by The Adjutant General. If a formal printed change is not received by the time the interim change expires, users will destroy the interim change.

Suggested Improvements. Users are invited to send comments and suggested improvements on DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to HQDA (DAMA–CSM–M) WASH DC 20310.

Distribution. *Active Army, ARNG, USAR:* To be distributed in accordance with DA Form 12–9A requirements for DA Pamphlets Logistics and Logistics Plans—D.

Contents (Listed by paragraph and page number)

Chapter 1
INTRODUCTION, *page 1*
Background and authority. • 1–1, *page 1*
Purpose. • 1–2, *page 1*
Major functions. • 1–3, *page 1*
Organizational elements of the system. • 1–4, *page 2*

Chapter 2
LIFE CYCLE OF TYPICAL ROUND OF AMMUNITION, *page 4*
Inception/requirements documentation. • 2–1, *page 4*
Ammunition research and development cycle. • 2–2, *page 4*
Initial requirements computation. • 2–3, *page 6*
Procurement/Production. • 2–4, *page 6*
Initial issue. • 2–5, *page 7*
Storage. • 2–6, *page 7*
Ammunition stockpile reliability. • 2–7, *page 8*

*This pamphlet supersedes DA Pam 700–16, dated 15 February, 1979.

UNCLASSIFIED

Contents—Continued

Conventional ammunition maintenance. • 2–8, *page 8*
Disposal. • 2–9, *page 8*

Chapter 3
MANAGEMENT AND LOGISTIC SUPPORT STRUCTURE, *page 10*
The management structure—overview. • 3–1, *page 10*
The Management Structure—Headquarters, Department of the Army. • 3–2, *page 11*
Functional interrelationships. • 3–3, *page 13*
The production base. • 3–4, *page 17*
Storage system. • 3–5, *page 22*
Transportation system. • 3–6, *page 25*

Chapter 4
DETERMINATION OF CONVENTIONAL AMMUNITION RATES AND REQUIREMENTS, *page 28*
Ammunition rates determination process. • 4–1, *page 28*
Ammunition programing requirements. • 4–2, *page 29*
Ammunition distribution requirements. • 4–3, *page 29*
Training ammunition requirements. • 4–4, *page 30*
War reserve stocks for allies. • 4–5, *page 32*
Special contingency stockpile. • 4–6, *page 32*
Operational projects (non-POMCUS). • 4–7, *page 33*

Chapter 5
OTHER CUSTOMER SUPPORT, *page 34*
US customers. • 5–1, *page 34*
Security assistance programs. • 5–2, *page 34*
Protection of US Stocks to ensure readiness. • 5–3, *page 34*
Explosive ordnance disposal support. • 5–4, *page 37*
Rationalization, Standardization, and Interoperability. • 5–5, *page 37*

Appendixes

A. REFERENCES, *page 41*

B. MANAGEMENT INFORMATION SYSTEMS, *page 43*

C. SUMMARY OF GOVERNMENT PRODUCTION BASE FACILITIES, *page 49*

Table List

Table 3–1: Army DESCOM Depots Storage Capacities—CONUS, *page 22*
Table 3–2: Army DESCOM Depots Storage Capacities—OCONUS (Pacific), *page 22*
Table 3–3: Army DESCOM Depots Storage Capacities—OCONUS (Europe), *page 23*
Table 3–4: Sustained Ship Outloading Capability, *page 27*

Figure List

Figure 2–1: Life Cycle of a Typical Round of Conventional Ammunition
* See new DODI 5000.2, *page 5*
Figure 2–2: Conventional Ammunition Maintenance, *page 9*
Figure 3–1: Procurement Program Formulation, *page 14*
Figure 3–2: Production Base Program Formulation, *page 15*
Figure 3–3: OMA Program (72) Ammunition Requirement & Funding System, *page 16*
Figure 3–4: RDTE Program Formulation, *page 17*
Figure 3–5: DoD Conventional Ammunition Production Base Government Owned Facility Locations, *page 19*
Figure 3–6: Location Government Plant Equipment Package Lines, *page 20*
Figure 3–7: CONUS Ammunition Storage Locations, *page 24*
Figure 3–8: Export Shipment Procedures, *page 26*

Contents—Continued

Figure 5–1: Single Manager for Conventional Ammunition (SMCA) Organizational Structure, *page 36*
Figure 5–2: Life Cycle of a Typical Round of Conventional Ammunition, *page 38*
Figure 5.3: MOA status between US and NATO [1]allies., *page 39*
Figure 5–4: Data Extracted from ABCA Armies Standardization Lists—Part 1—Cooperative R&D., *page 40*

Glossary

RESERVED

Chapter 1
INTRODUCTION

1–1. Background and authority.

a. In response to a Chief of Staff directive, the Army Staff undertook a major effort to enhance the overall ammunition posture of Army forces identified for NATO deployment in the FY77 timeframe. This effort created an awareness of need for overall coordination of individual functional activities relating to ammunition.

b. In recognition of this need, a Chief of Staff directive designated the Deputy Chief of Staff for Research, Development, and Acquisition (DCSRDA) as the principal Army Staff ammunition management executive, with authority for integration and coordination of Army Staff efforts to increase the effectiveness of the Army's management of the ammunition life cycle. The DCSRDA was further charged to—

(1) Establish and maintain a detailed system description of the ammunition life cycle process describing the interfaces of the commands/agencies involved and developing time schedules for the accomplishment of major objectives in the ammunition integrated management system.

(2) Initiate changes to the system as optimization studies may dictate.

c. The Chief of Staff had also directed a follow-on planning effort to provide distribution combat rates, theater requirements, stockage and storage objectives, construction requirements, and procurement programs for all theaters in the FY79, 83, and 86 timeframes. The DCSRDA also became responsible for this follow-on plan.

d. Recognition, in 1976, of markedly higher combat consumption rates for NATO-deployed forces also brought with it recognition of need for improvements in intratheater handling and distribution of ammunition. This awakening has in turn spawned other initiatives to enhance the Army's conventional ammunition postures. These are discussed in the following paragraphs individually. The most important of these ongoing activities is the implementation of the comprehensive DAIG Conventional Ammunition Special Review (CASPR) Report's recommendations.

e. The CASPR was an in-depth review of conventional ammunition, worldwide, conducted by The Inspector General (TIG). The report was accepted by the CSA in August 1980, and addressed all major issues, including organization for management, life cycle phases, acquisition, operational aspects, logistical functions, and readiness implications. The report identified 109 major recommendations for improvement of the Army's (Conventional) Ammunition Management System. The DCSRDA was assigned responsibility for implementation of the CASPR Report. A management strategy for accomplishing this tasking has been developed and status is being provided via a CASPR General Officer Steering Committee, VCSA IPR, Army Ammunition Plan, and the HQDA Quarterly Ammunition Review (QAR). The CASPR Report represents the Army's ongoing effort to improve the conventional ammunition system.

f. The Ammunition Initiatives Task Force (AITF), formed in response to the Vice Chief of Staff's directive, developed 75 recommendations covering both hardware development and procurement and doctrinal and organizational changes. These recommendations were approved, and the DCSRDA was designated as responsible for monitoring each recommendation and including its status in the Army Ammunition Plan.[1]

g. The Training Ammunition Authorization Committee (TAAC) was established as a continuing standing committee of the Department of the Army. The TAAC, composed of General Officer or equivalent senior Army representatives of interested staff agencies and major commands (MACOMs), is the executive forum established under the chairmanship of the Deputy Chief of Staff for Operations and Plans for the purpose of reviewing Army training ammunition resources, training goals, management procedures, training programs, and related activities.

h. The Training Ammunition Management System[2] (TAMS) was established under the primary Army Staff responsibility of the Deputy Chief of Staff for Operations and Plans. TAMS is the interface with the Army Planning, Programing, and Budgeting System (PPBS) and provides for managerial control of munitions expended in training.

1–2. Purpose.

a. This document is the system description directed by the Chief of Staff. It is intended to furnish a qualitative conceptual framework for integration of all Department of the Army activities in support of providing ammunition to United States operational forces and foreign military forces under security assistance programs. This includes ammunition research, development, and acquisition; distribution, storage, and maintenance; and ammunition production base readiness, modernization, and expansion.

b. The related Army Ammunition Plan provides to the Army major commands and agencies information regarding ammunition and ammunition support that can be expected in the near- to mid-term within current funding constraints. The Army Ammunition Plan consists of a series of interrelated plans in all applicable functional areas.

1–3. Major functions.

a. In addition to the overall executive responsibility previously described, the DCSRDA continues to exercise management of ammunition research, development, and acquisition activities. With regard to agencies and commands

[1] AR 15–20, Training Ammunition Authorization Committee, February 1977.

[2] AR 5–13, Training Ammunition Management System, September 1979.

under the cognizance of other DA Staff agencies, the DCSRDA exercises his overall responsibilities through and with the cognizant agency (i.e., for matters pertaining to Military Traffic Management Command (MTMC), in concert with Office, Deputy Chief of Staff for Logistics (ODCSLOG)).

b. The Deputy Chief of Staff for Operations and Plans (DCSOPS) retains authority for the Training Ammunition Management System (TAMS), determination of the force structure to be supported, the ammunition consumption rates, chairs the Training Ammunition Authorization Committee (TAAC), and establishment, where necessary, of priorities for development and distribution. The Deputy Chief of Staff for Logistics (DCSLOG) is responsible for the logistics aspects of Integrated Logistic Support (ILS); management of the fielded conventional ammunition stockpile; and the development of concepts, plans, policies, and procedural guidance for all conventional ammunition logistical missions and functions. The Chief of Engineers retains proponent functions for facilities. Each agency is responsible for keeping ODCSRDA informed of proponent actions influencing the ability of the system to satisfy requirements.

1–4. Organizational elements of the system.

a. Below the level of Headquarters, Department of the Army (HQDA), the major operational elements responsible for accomplishing various aspects of the Army ammunition program are—

(1) *The US Army Materiel Development and Readiness Command (DARCOM).* Subordinate commands and activities of the US Army Materiel Development and Readiness Command (DARCOM), which coordinates the program development and execution of these elements—

(a) The US Army Armament Materiel Readiness Command (ARRCOM). Wholesale materiel management, production base support, procurement, and production of Army standardized ammunition and selected, standardized conventional ammunition items of the other services assigned to the Army as the DOD Single Manager for Conventional Ammunition (SMCA).

(b) Munitions Production Base Modernization Agency (MPBMA) (subordinate activity of ARRCOM). Management of the Department of Defense (DOD) Munitions Modernization and Expansion Program; Ammunition Facility Design and Procurement; Manufacturing Methods and Technology (MMT); Modernization and Expansion Projects; and Plant Equipment Package modernization.

(c) US Army Defense Ammunition Center and School (USADACS) (subordinate activity of ARRCOM). Provision of technical, logistical, consultation, engineering, training, career management, and other specialized services for and in support of class V managers, DARCOM project/product managers, functional managers, major subordinate commands, field service activities, logistic assistance offices, and depots associated with worldwide ammunition logistic functions. This includes management of the Ammunition School; the Ammunition Depot Modernization Program; the Ammunition Civilian Quality Assurance Career Program; the Department of the Army Program for palletization, unitization, transportation, and storage methods for class V ammunition and ammunition peculiar equipment (APE); and the Department of the Army Worldwide Ammunition Logistic Support and Review Program (AR 700–13).

(d) Central Ammunition Management Office, Pacific (CAMO-PAC) (subordinate activity of ARRCOM). Central management of all US Army munition stocks within the Pacific; integrates and coordinates requirements and distribution; requisitions all munitions for the Pacific; formulates, monitors, and directs maintenance programs; monitors quality assurance and explosive safety programs; and serves as the Standard Army Ammunition System (SAAS) (see appendix B–4) manager for the Pacific area.

(e) US Army Armament Research and Development Command (ARRADCOM). Development and initial acquisition of new items of ammunition; technical support, if required, for fielded ammunition.

(f) US Army Depot System Command (DESCOM). CONUS depot storage operations, maintenance, and distribution to and from CONUS depots; distribution plan computations, in coordination with ARRCOM for SMCA assigned items.

(g) US Army Missile Command (MICOM). Development, acquisition, and material management of small rockets procured from the ammunition appropriation (PAA-Procurement of Ammunition, Army).

(h) US Army Test and Evaluation Command (TECOM). Development, production, and surveillance testing of ammunition.

(i) US Army Electronics Research and Development Command (USAERADCOM). Technology base for fluidic and electronic fuzing.

(j) US Army Materials and Mechanics Research Center (USAMMRC). Technology base for materials research and basic materials manufacturing processes.

(2) *MTMC.* Subordinate commands and activities of MTMC, which is the DOD Single Manager for intraCONUS and intertheater movement of all commodities, to include ammunition, and provides time-phased Service-developed lift requirements to Military Sealift Command (MSC) and Military Airlift Command (MAC)—

(a) Eastern Area, MTMC. Traffic management of ammunition movements, eastern half of CONUS.

(b) Western Area, MTMC. Traffic management of ammunition movements, western half of CONUS.

(c) US Army Terminal Group, Europe. Ocean terminal operations in support of US Army Europe (USAREUR).

(3) *US Army Europe (USAREUR).*

(a) Headquarters, USAREUR. Plans, policy, and programs for logistics support concepts, force structure, facilities, budgeting, positioning of stocks and actions involving other NATO countries.

(b) 200th Theater Army Materiel Management Center (TAMMC) Director of Ammunition Management, USAREUR. Munitions materiel management, storage, maintenance, and distribution for the European Theater.

(4) *US Army Japan (USARJ).* Munitions materiel management, quality assurance, maintenance, and storage for war reserves in support of Korea plus distribution for the Command.

(5) *US Eighth Army (EUSA).* Munitions materiel management, quality assurance, storage, and distribution for US Eighth Army and ROK War Reserve Stocks for Allies (WRSA).

(6) *US Army Western Command (WESTCOM).* Munitions materiel management, quality assurance, storage, and distribution for WESTCOM.

b. Principal supporting Army organizations are—

(1) *US Army Training and Doctrine Command (TRADOC).* Represents interests of the user; develops doctrine for logistic support; develops statements of materiel requirements; monitors requirements and distribution for TRADOC installations.

(a) US Army Missile and Munitions Center and School (USAMMCS). Combat developments and training to include organization, staffing, equipage, and employment of ammunition units and training of military ammunition personnel.

(2) *US Army Forces Command (FORSCOM).* Monitors requirements and distribution for FORSCOM installations and organizations.

(3) *US Army Operational Test and Evaluation Agency (OTEA).* User (operational) testing of development items (Field Operating Agency of Chief of Staff).

(4) *US Army Concepts Analysis Agency (CAA).* Principal US Army wargaming agency, provides major input to ODCSOPS for ammunition rates computation of requirements in support of the operations and contingency plans (Field Operating Agency of Chief of Staff).

(5) *US Army Logistics Evaluation Agency (USALEA).* Determination of support requirements and supportability of ammunition items (Field Operating Agency of ODCSLOG).

c. Integration of the functioning of all these elements will occur in the framework of the Army Planning, Programing, and Budgeting System (PPBS). This is the system through which resources are allocated to the various major program elements which support the ammunition program. The PPBS is also the medium for assignment of priorities among Program Elements within the annual Total Obligational Authority (TOA) guidance as specified by the Office of the Secretary of Defense (OSD). The resulting total Army program is then published annually in the POM.

Chapter 2
LIFE CYCLE OF TYPICAL ROUND OF AMMUNITION

2–1. Inception/requirements documentation.

a. The life cycle of a typical round of conventional ammunition is depicted in figure 2–1. The initial concept for development of a new round of ammunition or generic group of munitions (such as the Improved Conventional Munitions "Family") may originate either within the research and development community or within the user community. Perhaps more so in ammunition than in other commodities, a demonstrated potential for improved performance often leads to a formally stated requirement rather than the converse. Generally, "more" equates to "better." The user is interested in ammunition which is more accurate, more lethal, more reliable, lighter weight, less bulky, and which contains insensitive explosive filler, or offers some other quantifiable advantage. Further, drawdowns of existing stocks through combat, training, and testing consumption often offer an opportunity to replace older designs with newer designs, without the trauma associated with obsolescence of a combat vehicle fleet or other major items of capital equipment. Introduction of new items occurs with some frequency and older items are phased out with lesser frequency, keeping the inventory in an almost constant state of change. Change, in the direction of enhanced performance, can bring concomitant penalties. Most current weapons systems are high performance systems, in which even a minute change in one system parameter can have a profound change on system components. For example, attempts to secure higher velocity with state-of-the-art propellants bring with them higher breech pressures and accelerated bore erosion. The operational flexibility common to the use of older, less sophisticated, general-purpose ammunition is sometimes lost upon introduction of more modern but often more specialized ammunition.

b. The Letter of Agreement (LOA) is the normal requirements document used to initiate advanced development of ammunition items, in accordance with Army Regulation (AR) 71–9. The LOA is jointly prepared and authenticated by the materiel (DARCOM) and combat (TRADOC) developers, in coordination with the logistician (USALEA), when they both agree that a materiel concept has sufficient interest, importance, or operational and technical potential to warrant the commitment of advanced development resources to obtain more definitive information. The purpose of the LOA is to ensure agreement between the combat developer and materiel developer on the nature and characteristics of a proposed system and the investigation required to develop and validate the systems concept, and to define associated operational, technical, and logistical support concepts during the conduct of these investigations. The LOA is the document of record to support effort in the system Advanced Development (6.3.b) category of the Research, Development, Test and Evaluation (RDTE) program. Its preparation is initiated during Concept Exploration, and approval authorizes entry into the Demonstration and Validation Phase (para 2–2b(2)).

c. LOAs which project Advanced Development costs in excess of $20 million or later revise advanced development costs to exceed $20 million will be forwarded by the combat developer to HQDA (ODCSOPS) for approval; all other LOAs will be approved at the materiel developer and combat developer level and forwarded to HQDA (ODCSOPS) for information. In unusual circumstances, LOAs not in excess of $20 million may be specifically selected for HQDA decision.

d. The Required Operational Capability (ROC) document is the requirements document used to initiate engineering development of ammunition items. It is prepared by the appropriate TRADOC agency, in coordination with the DARCOM major subordinate command and the logistician (USALEA), and approved by HQDA (ODCSOPS). It is a concise, quantitative statement of the minimum essential operational, technical, training, logistical, and cost information necessary to initiate full-scale engineering development. It is initiated during the Demonstration and Validation Phase and must be approved prior to entering the Full-Scale Engineering Development Phase (para 2-2*b*(3)).

2–2. Ammunition research and development cycle.

a. New items of ammunition are developed on an event-oriented schedule, as specified in AR 1000–1 and the AR 70 series, with the pacing factor to be work completed, rather than calendar-controlled milestones. The Planning, Programing, and Budgeting System (PPBS) cycle must be taken into account, however, and it is often necessary to budget for RDTE funds in advance of successful attainment of intermediate R&D goals. In these events, obligation of the funds is then deferred pending attainment of the goals and demonstration of readiness to proceed with subsequent phases of the program.

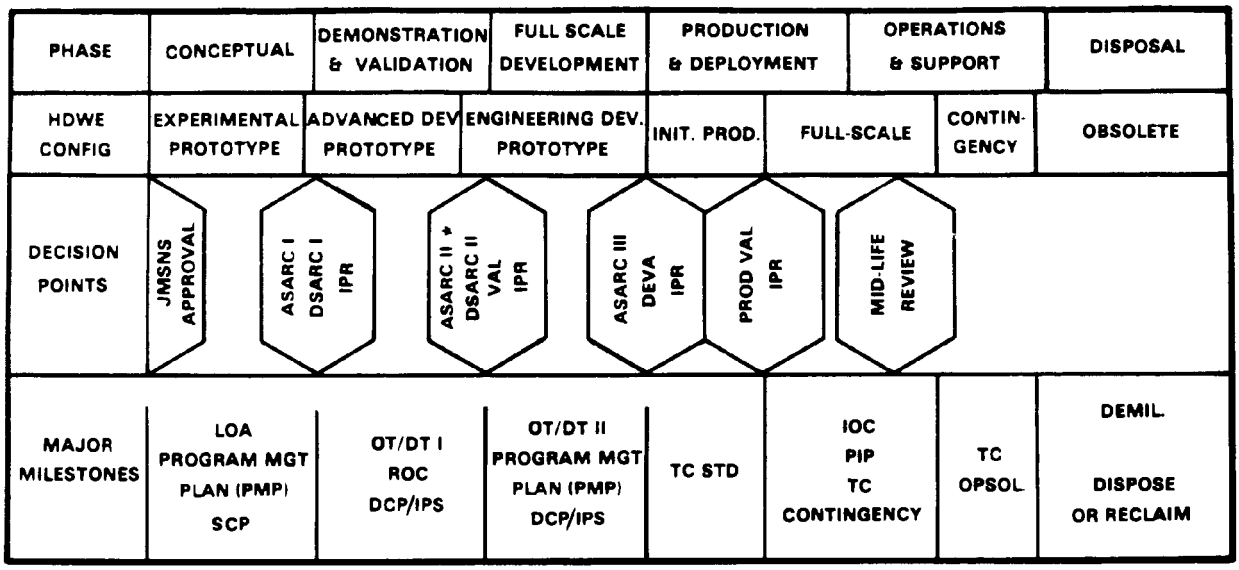


Figure 2-1. Life Cycle of a Typical Round of Conventional Ammunition
*** See new DODI 5000.2**

b. The R&D cycle is divided into three major phases—

(1) *Conceptual Phase*, in which the technical, military, and economic basis for proposed developmental ammunition systems/items are established and concept formulation initiated through pertinent studies and the development and evaluation of experimental hardware.

(2) *Demonstration and Validation Phase*, in which preliminary design and engineering are verified, tradeoff proposals analyzed, logistics problems identified during the Conceptual Phase resolved or minimized, formal requirement document prepared, and the concept validated for full-scale development.

(3) *Full-Scale Development Phase*, in which engineering is completed, relatively large numbers of the munition are produced in the final design configuration and tested under a wide variety of environmental conditions, and a decision is made on whether the item is acceptable for type classification and follow-on production and deployment.

c. R&D tests are broadly divided into two categories: Development Testing (DT) in accordance with AR 70–10 and Operational Testing (OT) in accordance with AR 71–3. Most of the DT is performed by TECOM. Most of the major OT is performed under the auspices of OTEA, usually by a troop unit of the FORSCOM, in coordination with the proponent TRADOC school (e.g., the Armor Center and School for tank ammunition). Both DT and OT are further divided according to major program phasing as follows:

(1) DT I and OT I are accomplished during the Demonstration and Validation Phase. Upon completion of this phase, an in-process review (IPR) is held to verify the readiness of the item to enter the Full-Scale Development Phase.

(2) DT II and OT II are accomplished during the Full-Scale Development Phase, at the end of which the Development Acceptance IPR is held (for nonmajor systems). At this IPR it may be decided that the item completely meets all established requirements, in which case it is type classified “Standard” and cleared for full-scale production. Alternatively, to provide maximum assurance that the design is suited to hard tooled mass production and, conversely, that the production version exhibits the performance characteristics verified for the design in Full-Scale Development, it may be decided on an exception basis to designate the item “Limited Production” (LP), and clear it only for low-rate production.

(3) In this latter event, testing (DT and/or OT) as directed at the IPR is conducted with low-rate production items. At the conclusion of this test cycle, a Production Validation IPR is held. If the item has met all test objectives, it will be declared “Standard” and cleared for mass production. If this testing had disclosed minor deficiencies in the design or the Technical Data Package (TDP), appropriate corrective measures would be initiated prior to initiation of full-scale production.

(4) Normally, the IPR chairman will be a member of the materiel development agency, ARRADCOM in most cases. The IPR committee makes recommendations for decision by the designated approval authority (usually a Major

Subordinate Commander), with DARCOM/HQDA usually only in a reviewing role; however, for some high-visibility or complex items, DARCOM/HQDA may exercise IPR approval authority.

2–3. Initial requirements computation.

a. The Army Acquisition Objective (AAO) quantity for a new item of ammunition is determined by the ODCSRDA (DAMA–PPP in coordination with DAMA–CSM), based on rate studies conducted by CAA in accordance with AR 710–8 under the sponsorship of the ODCSOPS (DAMO–RQR). Rate study data may be modified through coordinated decisions by the DA Staff, day-to-day uncertainties related to fast-changing guidance, budget and materiel priorities, as well as other considerations.

b. The rate studies take into account the projected performance characteristics of the developmental item (range, accuracy, lethality), the US/Allies weapons densities projected for the study period (for gun/launcher fired munitions), the threat in terms of enemy formations, equipment and tactical doctrine, and the postulated warfighting scenario. The studies are computer-based simulations which estimate consumption for a specified period of combat. A more detailed description of this process is contained in chapter 4.

c. Developmental items which are slated to replace items in the inventory pose some special problems in this requirements determination process. Serviceable inventory rendered obsolete must be addressed. Disposal action, if required, is discussed in paragraph 2–9.

d. In the event existing inventory of an item scheduled to be phased out of the supply system is below the AAO, and the developmental item scheduled to replace it is not scheduled to be type classified for several years, another type of management decision must be made. If the existing inventory is low relative to the requirement, it may be considered prudent in terms of force readiness to buy new inventory knowing that it will be rendered obsolete when the replacement item is type classified. Alternatively, when it is estimated that the production base can respond quickly in the event of hostilities, the inventory of the older item may be deliberately allowed to decline to avoid significant stocks of obsolete items. Current alternatives to reduce or eliminate ammunition items from the stockpile include Foreign Military Sales (FMS), Grant Aid, Military Aid Prorams, regulated training attrition, testing and controlled demilitarization.

2–4. Procurement/Production.

a. The procurement/production phase follows development of requirements and apportionment of appropriated program funds through OSD, HQDA, and DARCOM to the operating agencies (ARRCOM, ARRADCOM, and MICOM) comptrollers. The National Inventory Control Point (NICP) at ARRCOM validates the continuing need for procurement of each item of ammunition and the comptroller certifies the funds and releases them to the procurement organization for acquisition.

b. Although ammunition requirements and budget programs are expressed as complete rounds, most items, except for small arms ammunition, are procured as components. The production organization breaks the rounds into procurable elements (typically, the projectile, fuze, cartridge case, propelling charge, explosive, primer). The procurement organization formulates contracts with government-owned contractor-operated (GOCO) plants and with private industry, while the production organization directs work at Government-owned Government-operated (GOGO) plants. In general, metal parts are procured from the private sector, and production of propellants and explosives and load, assembly, and pack (LAP) is accomplished at government facilities; however, propellant may be obtained from industry, or metal parts from GOCO plants. The selection, in cases where multiple sources (both within the Government and in private industry) are available to produce an item, is based on plant workloading and scheduling considerations, maintenance of the mobilization base, and economic considerations. An economic analysis of the sources is conducted to determine the low-cost mix, and the economic solution is evaluated against noneconomic factors, such as new item requirements, modernization, mobilization, skill retention, and personnel impact. The Army's industrial base for production of ammunition is discussed in detail in paragraph 3–4 which addresses the logistic support structure.

c. Once the production is assigned, the production manager monitors the production effort using production and delivery schedules and reports. Procurement contracts and production delivery schedules must consider not only direct Army-funded programs but also customer orders from various funding sources for the same ammunition items and components. Testing during this phase of the materiel life cycle will be production testing in accordance with AR 702–9. All production and delivery schedules must be integrated and keyed to the assembly of complete rounds at the LAP plant. Once completed, the round is shipped to its first destination, the designated CONUS depot or overseas port, using funding supplied by the operating agency comptroller from a separate budget line maintained for this purpose.

d. Procurement and production responsibility for most ammunition items is shared by ARRCOM and ARRADCOM. Generally, responsibility for management of an item in development belongs to ARRADCOM, while ARRCOM has responsibility for developed items approved for service use. Transition of the responsibility from ARRADCOM to ARRCOM occurs when design stability is achieved, the configuration baseline is established, the Technical Data Package (TDP) has been validated, and user feedback has documented user satisfaction. Detailed transition criteria and procedures are specified in DARCOM Regulation No. 70–1. The Release of Materiel for Issue Program is managed by DARCOM.

e. Standard items remain assigned to ARRCOM even when a Product Improvement Program (PIP) is ongoing or planned, and the PIP effort is executed by ARRADCOM. However, if the PIP effort should result in a new item or a model change, the item may transition back to ARRADCOM based on the established transition criteria.

f. ARRADCOM continues to provide engineering design support for items transitioned to ARRCOM as tasked by ARRCOM concerning engineering design relationships to assure life cycle integrity during initial production engineering.

2–5. Initial issue.

a. Preparation for initial troop issue and subsequent use throughout the materiel life cycle begins during the Conceptual Phase. During this Phase, initial consideration is given to the concepts of reliability, maintainability, compatibility, and standardization. Because of this, the ammunition development command (ARRADCOM) and the ammunition readiness command (ARRCOM) work jointly to prepare for the initial field of a developmental ammunition item.

b. HQDA establishes policies for the Army Integrated Logistic Support (ILS) Program and standards for logistical acceptability/supportability of materiel systems and end items. USALEA assesses the application/execution of ILS policy. DARCOM, as the principal materiel developer, has responsibility for actual implementation (planning/execution) of ILS policy in actions related to—

(1) Major Items
(2) Secondary Items
(3) Operations and maintenance, Army (OMA) Programs
(4) Supply Support
(5) Distribution
(6) Storage and Transportation
(7) Inventory Accounting
(8) Maintenance Support
(9) Maintenance Interservice Support Management
(10) Maintenance Engineering and Planning
(11) Preparation of Equipment Publications
(12) Depot Planning and Operations for Support of New or Modified Ammunition Materiel
(13) Quality Assurance

c. ARRCOM and ARRADCOM establish and maintain a single ILS point of contact and conduct other related activities as required by AR 700–127, and the DARCOM, ARRCOM, and ARRADCOM supplements. These activities enable implementation of ILS and are usually done in conjunction with the appropriate TRADOC centers, school, and test boards, USALEA, and other interested agencies. Essential to these actions is the formulation of several related plans and schedules. These are the—

(1) Materiel Fielding Plan (MFP) (AR 700–127)
(2) Basis of Issue Plan (BOIP) (AR 71–2)
(3) Coordinated Test Program (CTP) (AR 70–10)
(4) New Equipment Training Plan (NETP) (AR 350–35)

d. The prime objective of this activity is to field a new or improved equipment, enhance operational readiness, improve logistic support, and minimize the cost of system ownership. Coordinated effort is essential to develop MOS training programs and maintenance procedures, prepare and print operation and maintenance publications, and related materiel actions.

2–6. Storage.

a. General.

(1) Most munitions are produced long before their ultimate consumption; therefore, the storage of ammunition is an important logistics consideration. “Long-term storage” actually encompasses two phases of storage. First, there is the transportation and storage of the munitions until they are transported to the Army in the field. Second, there is the transportation and storage of the munitions by the Army in the field until consumed. For some items, the length of time they may remain in storage is measured in decades. This is an important consideration in the design of packing and packaging materials, storage plans and storage aids, as well as the design of ammunition storage facilities. In general, ammunition must be protected from moisture and should be protected from temperature extremes when feasible.

(2) Most of the Army’s conventional ammunition is produced in Army Ammunition Plants (AAP’s) and shipped from these plants to storage depots in CONUS and overseas (primarily Europe and Pacific areas). Exceptions are the three former Navy facilities (McAlester, Hawthorne, and Crane) transferred to the Army on 1 October 1977 as GOGOs. Hawthorne Army Ammunition Plant has since become a GOCO facility, effective 1 December 1980. End items of ammunition are stored in the plants to the maximum extent practical to avoid the expenditure of additional

transportation handling costs incurred at depots, especially in CONUS. A listing of the facilities in which ammunition is stored is contained in paragraph 3–5*a*.

b. Use of open storage. The DOD Explosive Safety Board (DDESB), by 18 December 1974 letter to the Military Services, announced the following standard for open/covered storage of ammunition:

(1) Open storage is a temporary expedient and should not be used in lieu of standard methods for long-term storage.

(2) Earth-covered magazine storage should be used wherever possible. In comparison with other methods, it provides a higher degree of protection and safety for the ammunition and surrounding targets, greater physical security, and reduced maintenance of the ammunition. The Board supports open revetted pad storage only under emergency or temporary conditions, not for permanent, long-term use. An example of an approved use for open storage is for bombs slated for demilitarization stored on revetted pads between magazines.

c. Basic load storage facilities. The Army has consistently sought to use earth-covered magazine storage in all long-term storage facilities. In those areas where selected vehicles are uploaded, the Army is preparing facilities to meet DDESB explosive safety standards and applicable standards for physical security.

2–7. Ammunition stockpile reliability.

a. The purpose of the Ammunition Stockpile Reliability Program (ASRP), per AR 702–6, is to provide a means of evaluating the operational readiness, serviceability, safety, reliability, and performance of ammunition in the stockpile and/or deployed for use in combat or training and to provide information necessary for decisionmaking in the overall logistic management of ammunition—retention, maintenance, modification, or replacement.

b. For each ammunition item or grouping of similar ammunition items of the ASRP, a representative sampling scheme is developed and samples are selected and subjected to controlled laboratory tests, functional tests, stockpile reliability test firings, and visual inspections to determine the reliability and condition of the current stockpile and identify trends which may affect the overall quality. Timely identification of undesirable trends allows the ammunition manager to minimize the cost of retention of unreliable and unsafe stocks, schedule required maintenance actions, or establish removal/replacement intervals or schedule for priority of issue and use.

2–8. Conventional ammunition maintenance.

a. Unlike other commodities, maintenance requirements for ammunition cannot be determined on the basis of predetermined yardsticks such as flying hours, miles driven, or hours of operation, The degree of conventional ammunition maintenance (see figure 2–2) will vary dependent upon deficiencies involved, and can range from normal preservation and packaging activities (i.e., derusting and repainting), usually performed at the retail/user level, to more hazardous operations of disassembly and reassembly with serviceable components, modification, and conversion, normally done at the wholesale level. The lesser degree of maintenance is normally required in order for the ammunition to have the capability to withstand long-term storage without degradation of the stockpile. The more extensive maintenance (renovation) is to correct deficiencies affecting safety and reliability of the ammunition which could cause malfunctions resulting in death or serious injury to the user, or extensive property damage and loss of expensive weapons and equipment.

b. Maintenance at the user level is normally limited to preservation and packaging, such as derusting, spot-painting, delinking, and relinking of small arms ammunition for functional training requirements, or limited repacking of small quantities. More extensive maintenance (renovation) is performed in theater at depots in the rear areas, and in depots in CONUS. In theater rear areas, depots are usually equipped to perform practically all levels of maintenance, thus precluding the need to retrograde items to CONUS solely for maintenance purposes.

c. In past years, conventional ammunition has been degrading to unserviceable status at a much greater rate than can be supported by annual maintenance programs. This situation was caused by funding constraints which impacted upon pay of personnel, design and development of Ammunition Peculiar Equipment (APE) (AR 700–20 and DARCOM Supplement thereto), and availability of components for renovation. Army plans are to allot sufficient resources to eliminate the maintenance backlog by the mid–1980's.

2–9. Disposal.

a. Disposal of ammunition is required to purge the distribution system of ammunition which became obsolete, excess, unserviceable, uneconomical to repair, and/or condemned/hazardous for continued storage, maintenance, and/or use. Disposal as addressed herein primarily pertains to ammunition disposal/demilitarization operations involving large quantities of ammunition. Demilitarization excludes the destruction of duds on firing ranges by Explosive Ordnance Disposal (EOD) personnel.

b. Methods of disposal may involve the following:

(1) Sales to foreign governments through an international logistics program for surplus, excess, and obsolete ammunition which is otherwise serviceable.

(2) Commercial contract demilitarization.

(3) Disassembly and retention of usable components and packaging materials, washout of explosive filler, and

reclamation of propellant and metal parts for reuse. Unserviceable, unsafe, and/or unreliable components are demilitarized to assure they are free of explosives or harmful chemicals, and mutilated to the extent they cannot be used for the originally intended purpose.

(4) Demilitarization by detonation or burning. While still a viable method for disposal, environmental considerations place an ever-increasing constraint on detonation and open burning.

c. Scrap metal is sold through property disposal offices.

d. Demilitarization is performed by personnel specifically trained in the procedures, methods, and hazards associated with destruction of ammunition.

e. Equipment used by the Army in demilitarization operations is provided through the Ammunition Peculiar Equipment (APE) program. The APE program is an Army organic program to design, develop, test, and fabricate APE for all depot operations involving ammunition. APE is provided to Army customers on free issue basis and to other services and international logistics customers on a reimbursable basis. Current funding for APE in support of the demilitarization program is in PAA (OMA prior to FY80). Commodity Centers for APE are the US Army Defense Ammunition Center and School, Savanna Army Depot Activity and the Ammunition Equipment Office, Tooele Army Depot. The APE Program is essential to the Army demilitarization program since such equipment is specialized and not otherwise available from commercial sources.

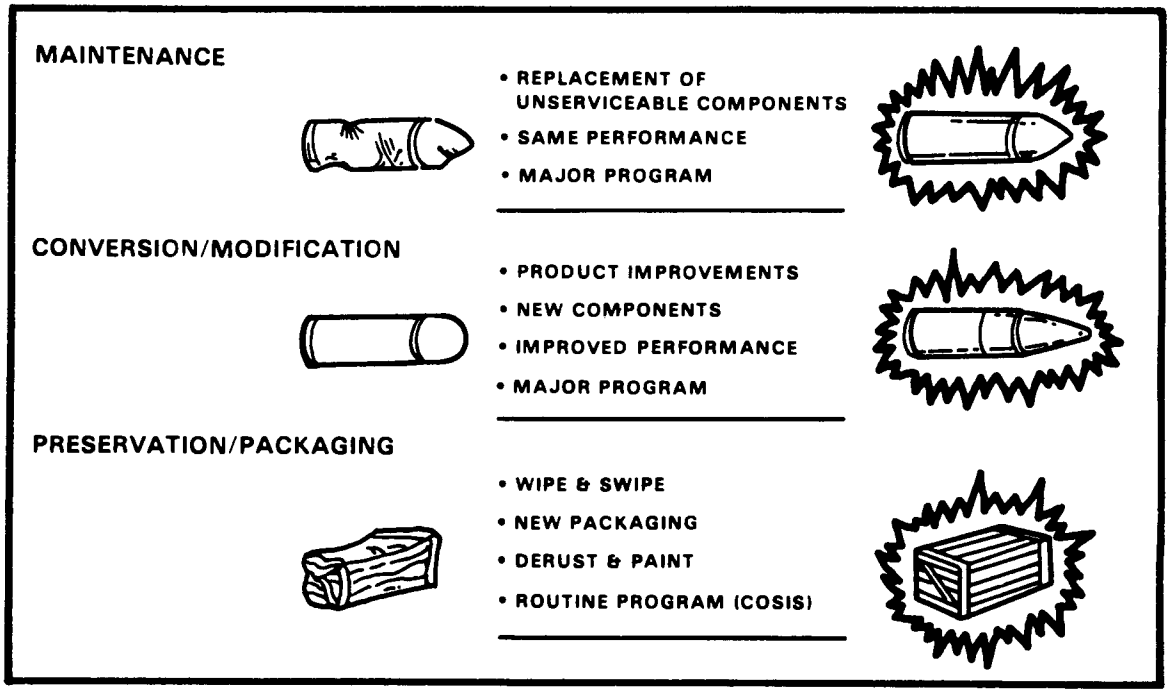


Figure 2-2. Conventional Ammunition Maintenance

Chapter 3
MANAGEMENT AND LOGISTIC SUPPORT STRUCTURE

3–1. The management structure—overview.

a. The HQDA management structure for ammunition parallels that for other commodities. Requirements determination and force structure accounting are the responsibility of the DCSOPS. Materiel acquisition program formulation and defense of the program in the budgetary process are the responsibility of the DCSRDA. Materiel distribution and maintenance requirements are the responsibility of the DCSLOG who likewise defends that portion of the Army budget.

b. The DCSOPS is the primary interface with TRADOC in the context of how the war will be fought and how our forces will be equipped and trained, with the intelligence community for opposing force capabilities and order of battle, and with Army major force commands for their assessment of our own tactics and force readiness. All provide major inputs, qualitative and quantitative, to the requirements determination process.

c. The DCSRDA is the primary interface with the materiel research, development, and acquisition community, DARCOM, and its subordinate materiel development and materiel readiness commands. Annually, DCSRDA provides DARCOM Army Acquisition Objectives (AAOs) based on programing rates furnished by DCSOPS. These AAOs, less asset projections, are the "first cut" of the procurement program, which is refined in detail, by priority and dollar ceiling, by the cognizant DARCOM major subordinate commands working with DCSRDA at a joint review—ARRADCOM for the development and initial acquisition program; ARRCOM for the balance of the procurement program. The missile community also is involved in this effort for rockets. MICOM is the NICP for VIPER and the XM77 grenades for the MLRS. While component parts are procured by MICOM, load, assemble, and pack is performed by ARRCOM. This refinement process is necessitated by considerations of most efficient use of dollars projected to be available in the budget versus the spread of the total AAO over the POM period. For instance, it may be necessary to procure one item one year and another item in the next year, due to an unacceptable cost penalty connected with stretching out production of each over a longer period. Likewise, in research and development, one program may be funded to the detriment of another when there are not sufficient funds projected to be available for a meaningful level of effort in both.

d. Upon final congressional approval of the annual budget request, the management of ammunition programs transfers to ARRCOM, ARRADCOM, and applicable PMS, in their respective spheres, with the apportionment of appropriated funds to those commands. Initial procurement of newly type-classified items is managed by ARRADCOM. The balance of ammunition procurement is managed by ARRCOM. ARRCOM also manages wholesale ammunition distribution (materiel management), surveillance, and maintenance activities in CONUS and maintains asset visibility and technical responsibility for surveillance and maintenance worldwide. CONUS wholesale ammunition is defined as that which is stored or moving between CONUS wholesale storage areas and has not been delivered to a "user" (TRADOC, FORSCOM installation, or CONUS port of embarkation).

e. With the exception of Crane Army Ammunition Activity (CAAA), Hawthorne Army Ammunition Plant (HWAAP), and McAlester Army Ammunition Plant (MCAAP), the CONUS depot operations are under the command of DESCOM. DESCOM ships ammunition as directed by ARRCOM and also performs surveillance and renovation under the technical direction of ARRCOM. The oversea depots and materiel management agencies are under command of the oversea commander and generally parallel the CONUS operations in their mission functions. These elements are part of the management structure and are the last link in their respective chains before the ammunition passes to the "user."

f. Movement of ammunition, both within CONUS and to oversea ports of discharge, is accomplished under procedures agreed to by the Military Departments and/or SMCA and is administered by MTMC. For a given fiscal year, ARRCOM and ARRADCOM budget for first destination transportation, and depots budget for second destination transportation to CONUS installations and CONUS ports of embarkation, as part of the OMA Appropriation. The military services budget for transportation and shipping, ocean terminal operations, and reimbursement of MTMC and MSC for expenses incurred. All modes/categories are reimbursable by the shipping command/service. CONUS outports and ocean shipping are industrially funded. Oversea ports are OMA funded. The oversea commands are responsible for movement from the ship's hook onward within the theater.

g. The bases for all transportation budget forecasts are annual oversea command call-forward projections (replenishments and prepositioned materiel buildups—all classes of supply) plus CONUS-originated "push" projections for all commodities. DARCOM aggregates these for the entire Army and furnishes them to ODCSLOG for review and validation. Port handling and ocean shipping forecasts are forwarded by ODCSLOG to MTMC and MSC, respectively.

h. Except for Korea, construction of new ammunition storage facilities and major modification or rehabilitation of existing facilities are the responsibility of the Corps of Engineers, in response to total Army-wide facilities requirements furnished by ODCSLOG. Major modifications are those exceeding the cost criteria for OMA funding. Land acquisition for new facilities overseas is the responsibility of the theater commander, as is acquisition through leasing of host nation ammunition facilities for US use. In USAREUR, ammunition storage facilities are programed through the host nation using NATO Infrastructure Funding. To date, however, this has supplied a relatively minor part of the total requirement. US participation in the NATO Infrastructure Program is normally limited to ensuring that user

requirements are met. Design and construction are accomplished by the host nation. By agreement with the Republic of Korea, acquisition of ammunition storage facilities in Korea is that country's responsibility. The facilities are operated by Republic of Korea Army (ROKA) but jointly used by ROKA and EUSA under the Single Ammunition Logistics System—Korea (SALS–K). Separate asset identity is maintained and the US retains accountability arid control of both EUSA and WRSA earmarked for ROKA use in event of hostilities. US is also charged with quality assurance of these stocks while ROKA performs storage, maintenance, handling, and transportation functions under direction of EUSA in accordance with SALS–K MOA.

i. The Secretary of the Army is designated as the DOD Single Manager for Conventional Ammunition (SMCA) by DOD Directive 5160.65. The Commanding General (CG), DARCOM is delegated by the SMCA Charter the authorities of the Secretary of the Army for execution of SMCA operations with power to redelegate. The Executive Director for Conventional Ammunition (EDCA) is designated by CG, DARCOM, and the SMCA Charter for performance of the SMCA activities with power to carry out functions assigned to the CG, DARCOM.

j. ARRCOM is the principal field operating activity of the SMCA and is responsible for acquisition of Army fielded munitions items and assigned munitions of the other services. This includes production base support and procurement of items for all DOD services and other programs such as Security Assistance. Under the Single Manager concept, ARRCOM is also responsible for distribution, storage, maintenance, and disposal of Air Fore, Navy, Marine Corps, and Army stocks stored in CONUS wholesale installations. Requirements of all services are aggregated, and the services reimburse the Army for major maintenance and renovation work performed on their stocks. The Army, as the SMCA, budgets to support the care of supplies in storage (COSIS) workload,

k. ARRCOM coordinates with ARRADCOM to develop procurement and production strategy for new items and to ensure a smooth transition from the development phase to the operational or fielded phase of the materiel life cycle. ARRCOM/MPBMA ensures maintenance and modernization of the production base for currently fielded items, and in coordination with ARRADCOM, is responsible for development of an adequate production base for anticipated modernization items. The ARRCOM also coordinates with other major Army commands (MACOM) to develop materiel call forward plans, provide logistics and technical support, and other customer assistance as required.

l. The MPBMA is responsible for development, budgeting, and management of the major program to modernize the existing ammunition production base and expand it to provide for manufacture of newly developed items, at locations and against requirements specified by ARRCOM. MPBMA also manages the supporting manufacturing technology base through funding of projects to develop the most cost-effective manufacturing techniques and process controls.

3–2. The Management Structure—Headquarters, Department of the Army.

a. Office of the Deputy Chief of Staff for Research, Development, and Acquisition (ODCSRDA).

(1) *Director of Combat Support Systems (DAMA–CS).* Is the principal Army Staff Ammunition Management Executive (delegated by DCSRDA) with authority for integration and coordination of Army Staff efforts to increase the effectiveness of the Army's ammunition life cycle.

(2) *Munitions Division (DAMA–CSM), Combat Support Systems Directorate.* Serves as focal point on the Army Staff for overall management of Army conventional ammunition. This division handles all DA Staff actions pertaining to research, development, and acquisition of conventional munitions, production base modernization and expansion, and major management actions such as implementation of the SMCA efforts (a DOD mission), preparation and updating of the Army Ammunition Management System description, implementation of the CASPR recommendations, preparation and updating of the Army Ammunition Plan, and conduct of the DA Quarterly Ammunition Review (chaired by the Director, Combat Support Systems).

(3) *Research, Development, Test and Evaluation Programs and Budget Division (DAMA–PPR), Materiel Plans and Programs Directorate.* Responsible for issuance of fiscal guidance for Budget and POM to ODCSRDA commodity divisions and for assembly of division inputs into annual Army program for the RDTE Appropriation. Monitors release of program funds for execution.

(4) *Procurement Programs and Budget Division (DAMA–PPP), Materiel Plans and Programs Directorate.* Functions similar to (3), above, for the procurement appropriations, to include Procurement of Ammunition, Army. Also exercises supervision over requirements computations performed by the US Army Research, Development, and Acquisition Information Systems Agency (RDAISA).

(5) *Policy, Plans and Management Division (DAMA–PPM), Materiel Plans and Programs Directorate.* Responsible for planning, programing, and budgeting for maintenance of the inactive ammunition production base from the OMA appropriation and for industrial preparedness planning. Responsible for research, development, and acquisition policy, development test policy (AR 70–10), and production test policy (AR 702–9).

b. Office of the Deputy Chief of Staff for Operations and Plans (ODCSOPS).

(1) *Operations Readiness and Mobilization Directorate (DAMO–OD).* Assesses the adequacy of the Army Ammunition Management System to support operations and contingency planning, with emphasis on the current year. Provides current tactics, doctrine, and concepts and submits the data to DAMO–RQ for combat computer simulations. Maintains current MACOM Required Supply Rates (RSR) and basic load requirements. Provides current force structure and

current deployment sequence to DAMO–RQ for combat computer simulations. Provides and/or validates ammunition requirements for planning and assisting DCSRDA in program development in the following areas:

(a) Army Operational Projects.

(b) Army Non-Combat Requirements (Civil Disturbance).

(2) *Force Management Directorate (DAMO–FD).* Provides the DA Master Force File containing current and projected force structure and force deployment information to CAA which provides computational support to Total Army Analysis. Employs approved force structure in development of Logistics Structure and Composition System (LOGSACS) which supports POM development and is used by CAA for combat simulations and DARCOM for calculations of stockage objectives.

(3) *Combat Service Support Division (DAMO–RQL), Requirements Directorate.* Serves as the ODCSOPS single point of contact responsible for integration and coordination of all conventional ammunition actions within ODCSOPS. Establishes ammunition priorities and validates requirements for developmental ammunition to include LOA, ROC, and Letter Requirements (LR) contained in the Catalog of Approved Requirements Documents (CARDS). Develops current and projected weapons/munitions lists and provides this data for determining combat consumption rates. Obtains from TRADOC the POM and Extended Planning Annex doctrine and tactics to support combat computer simulations. Analyzes the simulations performed by CAA and recommends rates for use by ODCSLOG, ODCSRDA, and MACOMs in developing the Army Ammunition Plan. Provides ammunition consumption levels used in the conduct of the Total Army Analysis and OMNIBUS Studies. Provides and/or validates ammunition requirements for planning and assists ODCSRDA in program development for Post-D-Day consumption and ODCSLOG in determining stockage objectives.

(4) *Strategy, Plans and Policy Directorate (DAMO–SS).* Provides Extended Planning Annex and other force deployment sequences to DALO–RQ for combat computer simulations. Ensures that force structure and deployment data used in ammunition rate studies is coordinated with that provided to the Joint Planning System. Provides to DAMO–RQ allied forces data and assists in the development of weapons/munitions lists and rates to support those forces. Monitors the US ability to meet ammunition requirements of allies. Assesses political-military impact of rates and resulting stockage objectives. Provides and/or validates ammunition requirements for planning and assists DCSRDA in program development in the following areas:

(a) Special Contingency Stockpile (SCS) requirements.

(b) War Reserve Stocks for Allies (WRSA).

(c) Information on allies' ammunition status—

(1) Peacetime and wartime production capabilities; (2) Projected production by timeframe for ammunition; and (3) Current ammunition asset posture.

(5) *Training Support Division (DAMO–TRS), Training Directorate.* Exercises primary staff responsibility for the TAMS, establishing coordinated guidance for developing training ammunition requirements, maintains TAAC-validated requirements and transmits these to ODCSRDA for incorporation into the AMP, sets priorities within and between training ammunition procurement programs, prepares coordinated training ammunition authorizations for commands, and uses the Training Ammunition Management Information System (TAMIS) in managing Army ammunition assets expended in training. Provides and/or validates ammunition requirements for planning and assists DCSRDA in program development in the following areas:

(a) Training Ammunition authorizations for Active and Reserve Components,

(b) Training Ammunition requirements in support of mobilization.

(c) Training Ammunition authorizations in support of special operations, allied training, and other Federal activities.

c. Office of the Deputy Chief of Staff for Logistics (ODCSLOG).

(1) *Resources and Management Directorate (DALO–RM).* Serves as DA Program Director for OMA Program 7 (supply, maintenance, and transportation). Aggregates OMA Program 7 requirements within ODCSLOG and defends them in the Budget/POM process.

(2) *Ammo/Special Weapons Office (DALO–SMA), Supply and Maintenance Directorate.* Serves as the ODCSLOG single point of contact responsible for integration and coordination of all conventional ammunition actions within ODCSLOG. Determines war reserve stockage levels to support the force specified by ODCSOPS for the support period established by DOD and Army guidance. Computes distribution requirements, in coordination with ARRCOM and MACOMs, to meet specified stockage levels for war reserve, training, operations, special contingency projects, and security assistance requirements. Determine storage facility requirements, in coordination with MACOMs, and conveys new or upgraded facility requirements to Office, Chief of Engineers for programing, budgeting, and execution. Develops concepts, policies, plans, and procedural guidance for conventional ammunition allocation, distribution, stockpile reliability, maintenance, and disposal.

(3) *Plans, Readiness and Systems Directorate (DALO–PL).* Responsible for analysis of operations and contingency plans for logistic supportability and identification of logistic resource shortfalls. DA Staff responsibility to monitor development of overall logistics concepts, doctrine, and, in coordination with ODCSOPS, logistics force structure. Monitors force logistics readiness worldwide.

(4) *Transportation, Energy and Troop Support Directorate (DALO–TS).* Responsible for strategic mobility plans and

programs, and transportation force structure development. Principal concern for ammunition supply is intertheater life capability–port capacity and availability of ocean shipping. Acts as HQDA interface with MTMC and MSC.

d. Chief of Engineers (COE). Programing Division (DAEN–ZCP), Assistant Chief of Engineers (ACE). Serves as the COE single point of contact for integration and coordination of all conventional ammunition activities within COE, Responsible for planning, programing, and budgeting construction to support ammunition production and storage requirements except for those actions associated with PAA funding for construction of production facilities.

e. Other Army Staff agencies. Other Army Staff agencies retain responsibility for conventional ammunition program accomplishment within their assigned functional areas; e.g., ODCSPER (Physical Security, Explosive Safety, Civilian and Military Personnel), OCA (Army Budget, reprogrammarming). Each staff agency will designate an organizational element as a single point of contact to coordinate ammunition management and SMCA matters within its agency.

3–3. Functional interrelationships.

Organizational responsibilities described in the preceding portions of this section are portrayed schematically to each other and to specific tasks/events in the Budget/POM process in the following figures:

a. Figure 3–1—Procurement Program Formulation

b. Figure 3–2—Production Base Program Formulation

c. Figure 3–3—OMA Program (72) Ammunition Requirement & Funding System

d. Figure 3–4—RDTE Program Formulation.

PROCUREMENT PROGRAM FORMULATION (PAA, ACTIVITY 1)

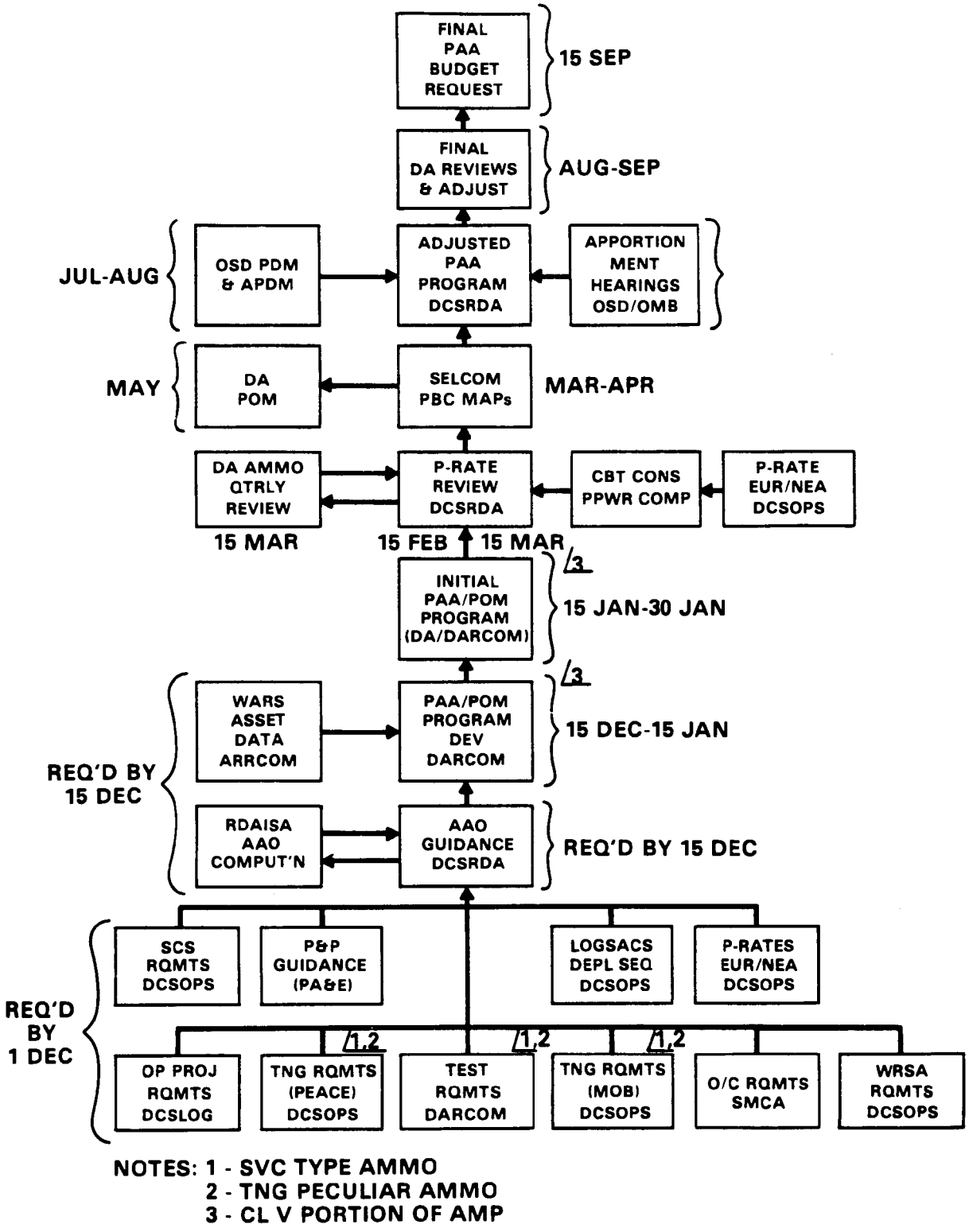


Figure 3-1. Procurement Program Formulation

PRODUCTION BASE PROGRAM FORMULATION (PAA, ACTIVITY 2)

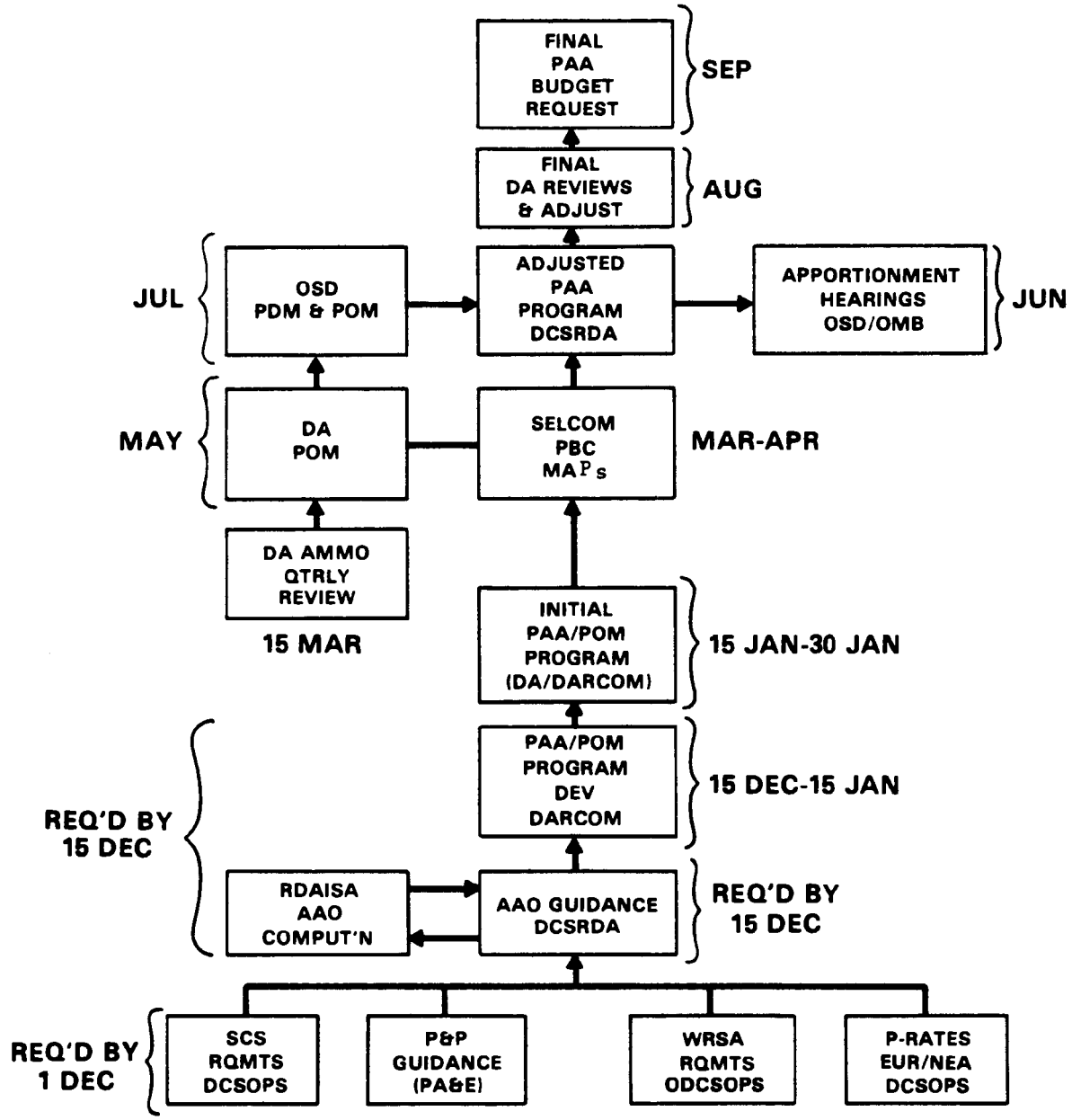


Figure 3-2. Production Base Program Formulation

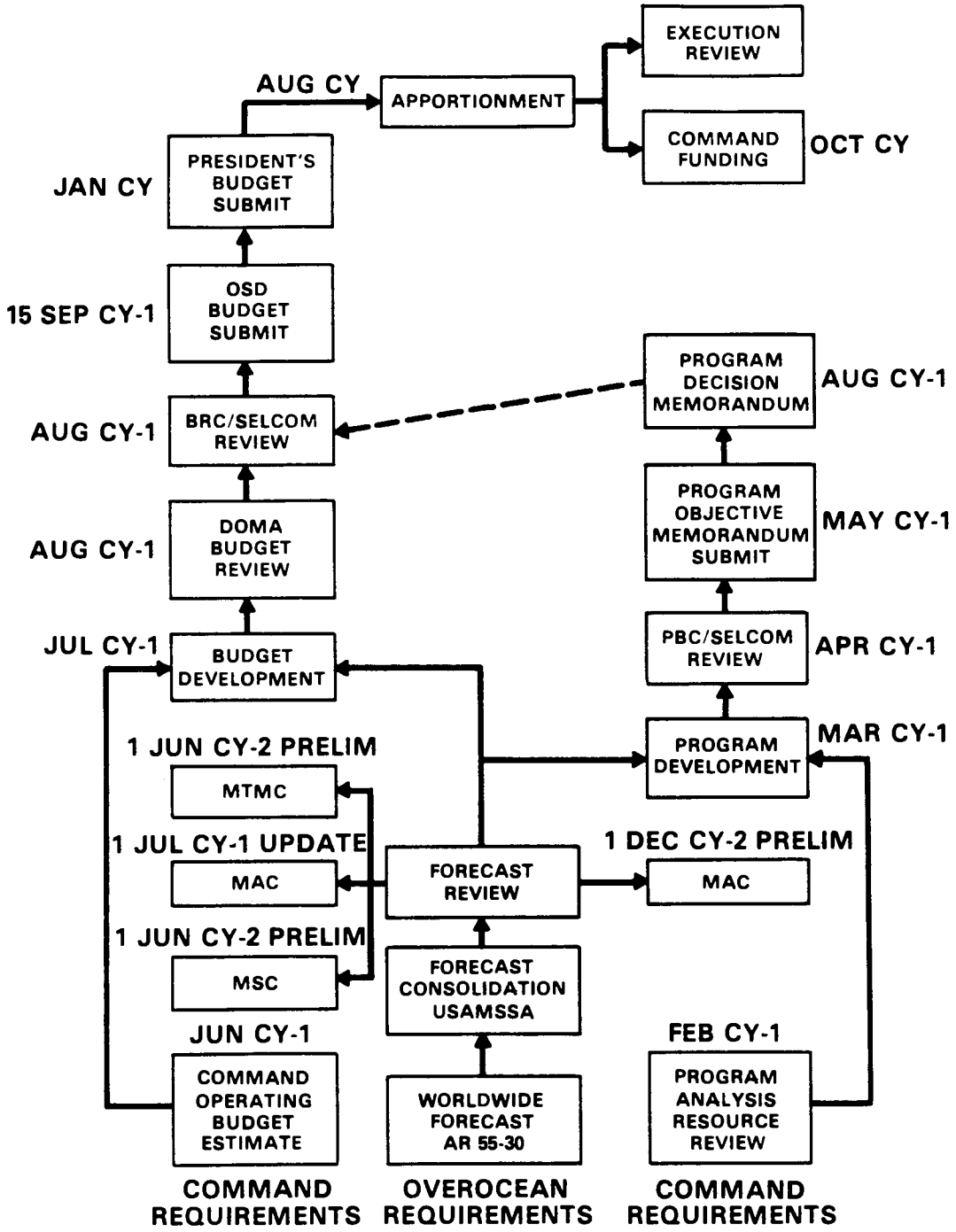


Figure 3-3. OMA Program (72) Ammunition Requirement & Funding System

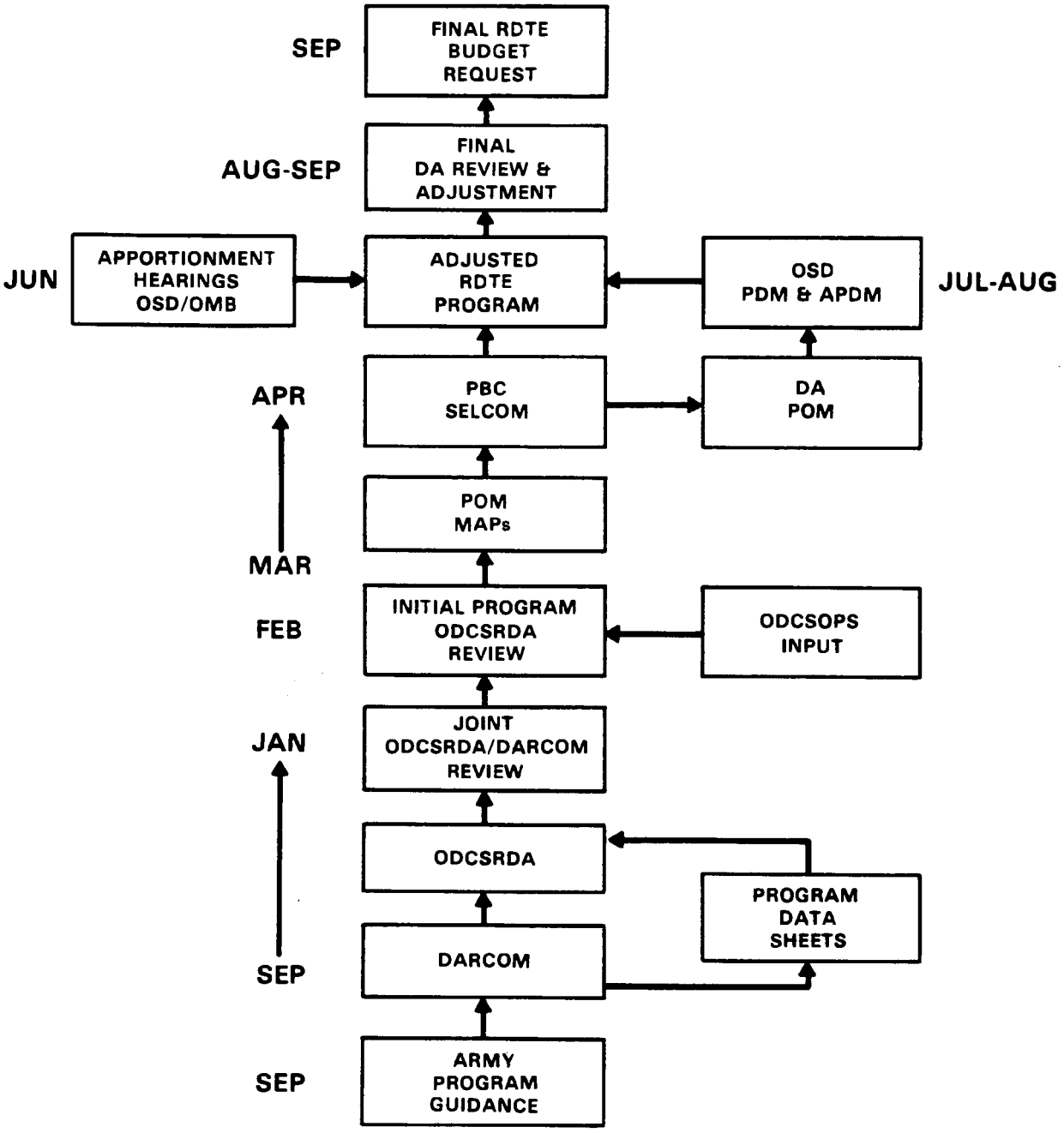


Figure 3-4. RDTE Program Formulation

3–4. The production base.

a. General. The ammunition production base is the national manufacturing complex required to produce metal parts and components, manufacture propellants and explosives, and to load, assemble, and pack ammunition components and end items. The production base consists of hundreds of current and planned producers categorized into three groups: GOGO facilities, GOCO facilities, and contractor-owned contractor-operated (COCO) facilities. There are 25 GOCO plants and 3 GOGO in existence and 1 GOCO being constructed. Twelve GOCO plants are in layaway status; the balance of the base is active. Also constituting part of the Government-operated segment of the production base are arsenal and laboratory facilities collocated with Army R&D activities. There are a total of 91 contractor-owned plants which utilize Government-owned plant equipment packages. The replacement value of the production base is in excess

of $22 billion. The base comprises the hard core of our capability to equip and sustain the Army, as well as the Air Force, Navy, and Marine Corps, with ammunition during any armed conflict.

b. Description of base. Figure 3–5 depicts the location of all GOCO and GOGO production base facilities. Specific data concerning the current active and inactive Government-owned facilities and modernization plans is shown in appendix C. The private sector of the production base is of crucial importance to conventional munitions production. The most important source of metal parts for ammunition ranging from 20mm through 16-inch projectiles, cartridge cases, and fuzes is located in private industry which uses its own equipment as well as plant equipment provided by the Government. Figure 3–6 indicates the location of plant equipment packages throughout the United States. In addition, other plant equipment packages formerly assigned to producers (X-facility lines) are now in storage.

(1) For ammunition alone, the Army has approximately 472 Production Schedule Planning Agreements (DD Form 1519) with private industry to provide for rapid conversion of facilities from peacetime to wartime production requirements upon mobilization. There are also 542 Production Schedules for Mobilization Planning Purposes in the GOCO/GOGO sector for a combined total of 1014 Production Schedules. These Government planning agreements with industry allow for contractor facilitization prior to mobilization, primarily using Government-owned equipment, and form an integral portion of the Army's mobilization base.

(2) The GOGO/GOCO plants provide the bulk of propellant and explosive manufacturing capability as well as the larger portion of load, assembly, and pack capability while private industry provides nearly all the Government's needs for metal parts, fuzes, components, and packaging. In general, these metal parts are supplied to the GOCO plants where they are loaded, assembled, and packed into complete rounds for distribution to the military users.

c. Production base management and planning.

(1) *Single manager*— The Secretary of the Army has been designated responsibility as DOD Single Manager for Conventional Ammunition (SMCA). The SMCA is assigned a wide range of conventional ammunition items of the Army, Navy, Air Force, and Marine Corps, and is responsible for procurement, production, related production base facilities, and wholesale supply, maintenance, renovation, demilitarization and disposal and transportation of these items.

(a) The Executive Director for Conventional Ammunition (EDCA) is assigned the mission to manage and execute the DOD SMCA program. The EDCA, under the authority of the CG DARCOM, manages and executes the SMCA program in accordance with the authority and responsibilities prescribed in DOD Directive 5160.65 and the SMCA charter. The EDCA is the SMCA focal point in the National Capital Region and interfaces with all levels of the DOD organization involved in the execution of the SMCA mission.

(b) The Commanding General, ARRCOM, has been delegated responsibility for the conduct of field operations for the SMCA.

(2) *SMCA support*— In support of the SMCA, the US Army has dedicated ammunition production base planning and management activities at DA staff level and within DARCOM and two of its principal subordinate commands, ARRCOM and ARRADCOM.

(a) The MPBMA under ARRCOM performs planning, programing, and management functions for ammunition production base modernization and expansion efforts of the DOD. Design and construction of these modernization and expansion projects is the responsibility of the Chief of Engineers. The US Army Engineer Division, Huntsville, is responsible for technical and fiscal management of construction activities.

(b) ARRADCOM is the technological base for production base operation, modernization, and expansion through development of new MMT, design of initial production of facilities (IPF), mass production process equipment planning, and conduct of initial procurement. ARRADCOM also initiates new item base transitioning to ARRCOM and technical support to ARRCOM for transitioned base facilities and equipment.

(c) ARRCOM manages the transitioned production base through implementation of the Army's Industrial Preparedness Program (AR 700–90) and is responsible for complete procurement/production after initial production. ARRCOM also manages the annual Production Support and Equipment Replacement (PS&ER) program for active GOCO plants. The PS&ER program is to sustain the ability to meet current and planned production requirements through maintaining the design capacity of equipment and facilities by equipment replacement and correction of normal deterioration through repair.

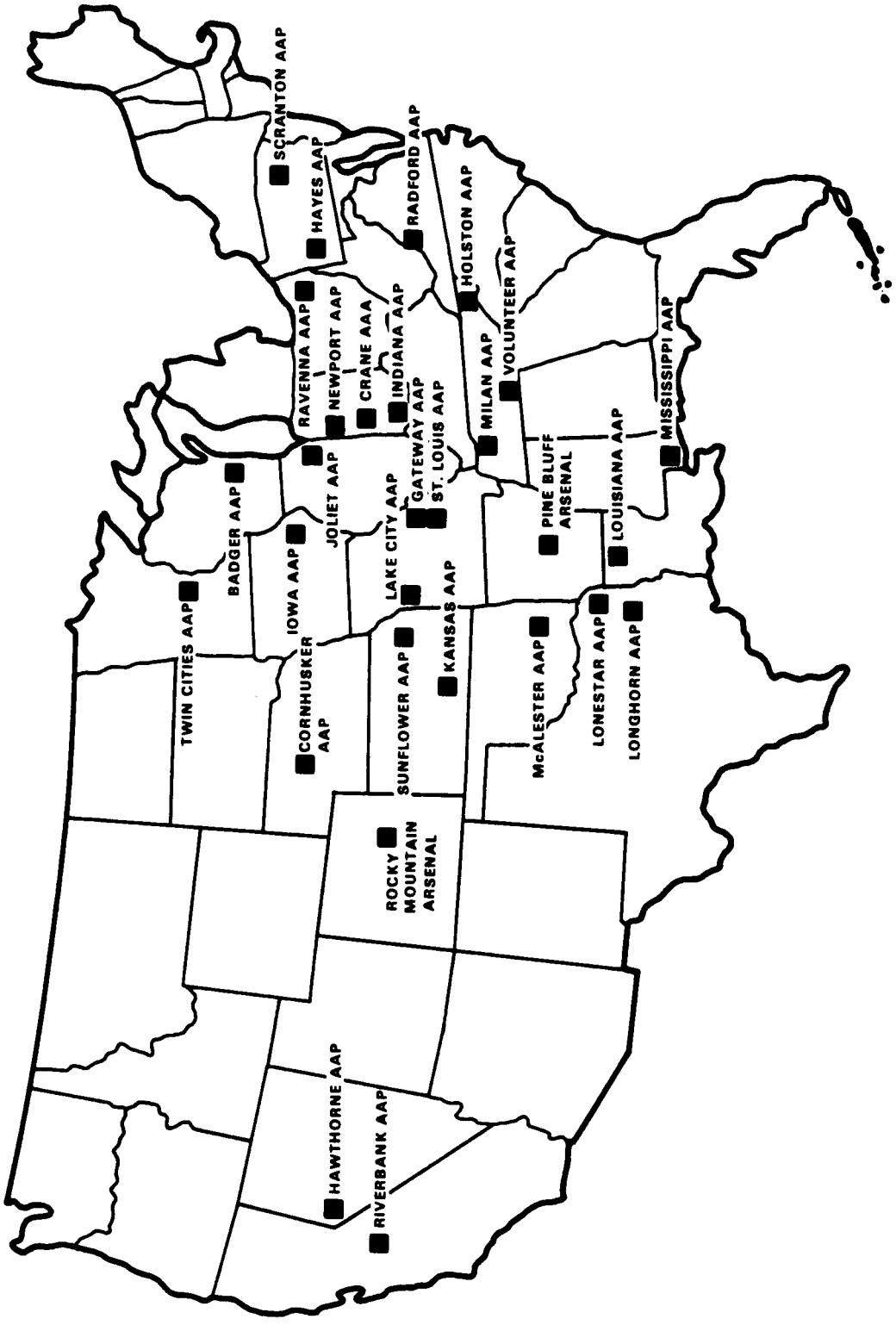


Figure 3-5. DoD Conventional Ammunition Production Base Government Owned Facility Locations

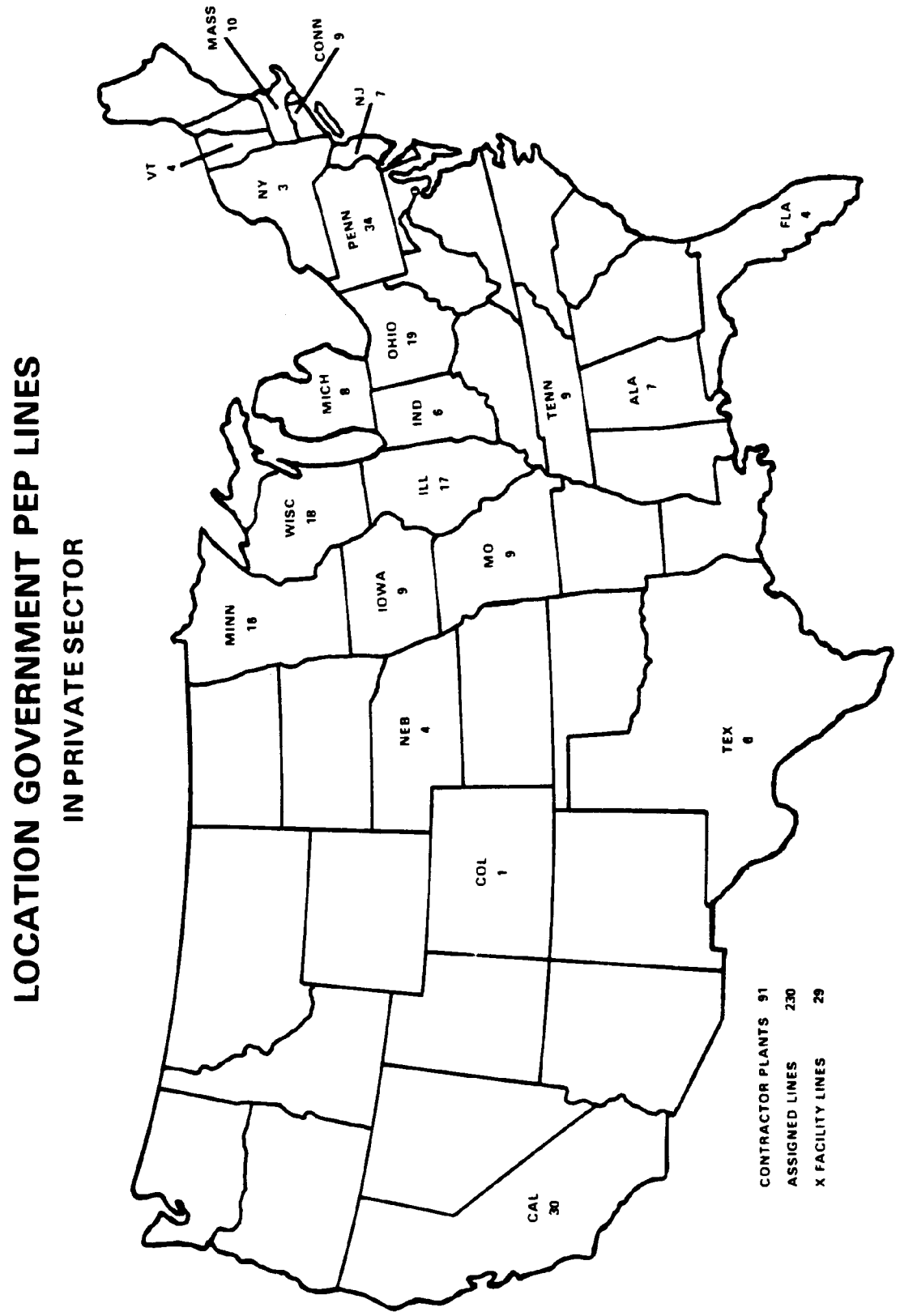


Figure 3-6. Location Government Plant Equipment Package Lines

(3) *Plans and Management Systems*— There is a well-executed planning system, the Production Base Plan (PBP)/ Production Base Analysis, which records the comparatively recent munitions production base experience and is the basis of information for necessary justification and direction for structuring the retention, layaway, and maintenance of the current base. A DOD Munitions Production Base Modernization and Expansion (M&E) plan is also maintained and periodically updated which controls the total M&E effort at the project level at all Government and commercial facilities. Other relevant management information systems include Plant Equipment Package Management Information System (PEPMIS) and the Production Base Maintenance and Layaway Data Base. These plans and management systems effectively implement the Army's Industrial Preparedness Program (IPP) guidelines and policy as required in AR 700–90.

d. Long-term problems of the base.

(1) Base age and resource availability. The current ammunition production base is, to a large degree, of World War II and Korean War vintages, with many facilities which are obsolete and difficult to maintain. Since the establishment of the base, there have been rapid technological advances as well as acutely increased attention to environmental and occupational safety and health factors. These influences have resulted in entirely new and diverse families of ammunition, major improvements to existing ammunition components, new and increasingly more complex manufacturing/ production processes, and the recognition of the fact that ammunition plants present serious safety and environmental health issues requiring systematic elimination. Compounding these has been the decreased availability of skilled ammunition base personnel due to normal attrition and budgetary restrictions, plus higher skill requirements to operate the more efficient but more sophisticated modern plant equipment.

(2) *Commitment to base during peacetime.* Another issue associated with the production base has been the sometimes changing US commitment to base maintenance as a vital factor in our nation's defense. The base historically has contracted severely in peacetime, often with the virtual writeoff of billions invested in the crisis of war, only to be continually revived with still larger investments at the outset of each new emergency. This situation has a significant impact not only on the size and quality of the physical base but also seriously affects the private corporations involved in its support. A declining peacetime procurement environment is generally followed by a declining interest in commercial producer participation in mobilization planning since producers are not remunerated for this planning. Additionally, many capable former producers have declined to participate in ammunition production, not wanting to be labeled "merchants of death" and because of the difficulties of compliance with nonemergency Government procurement regulations and adverse treatment which they have received from Government regulatory and legislative bodies.

(3) *Changing ammunition requirements.*

(a) Another part of the production base issue in peacetime is fluctuating requirements and the effect on requirements of revised/updated threat (size, sustainability, weapons/munitions, warning time, and buildup rate), OSD guidance (duration of conflict, allies assumptions, production bases constraints) and Army plans (force structure, deployment sequence, POMCUS size, and weapons/munitions). This creates a continuously changing environment causing widely fluctuating requirements for ammunition production. Uncertainty as to availability of new developmental weapons and their relative lethality further complicates the requirements picture as well as the problem of balancing standard ammunition stocks and lead-time-constrained base resources.

(b) Some scenarios also plan for relatively short periods of war where a slowly reacting base, or portions of it, might not seem needed. However, others point to the distasteful choices available in the absence of a sustaining base if short wars become protracted. Lack of attention to the needs of the base results in extending the leadtime necessary for start-up and acceleration of production in emergencies. As the temperature of the base drops from warm to cold, its ability to expand rapidly is seriously impaired.

e. Program for base modernization and expansion. Detailed FYDP coverage of this program is contained in the Production Base Plan, annex C of the Army Ammunition Plan.

f. Laidaway production base operations and maintenance.

(1) *General.* ARRCOM is responsible for management of production base operations and maintenance. As some 87 percent of base facilities are over 20 years old, the capability of plants to respond in mobilization situations is a great concern. Nowhere is this concern more apparent than in laidaway base workloading and maintenance. As opposed to "warm" portions of the production base, standby or laidaway elements often do not have sufficient personnel or funding resources to maintain essential portions of their facilities.

(2) *Impact.* Due to the shortfall in funding resources, laidaway elements of the base have received only minimum levels of maintenance. The effect of reduced maintenance is to reduce the reactivation responsiveness of the production base. Experience with start-up of selected laidaway base elements proves that base readiness is seriously compromised due to the increased time and money required to repair urgently needed facilities. Although maintenance of the base is costly, some of the alternatives appear costlier; e.g., an increase in ammunition stocks, and related support needs, to equalize the diminished base readiness, or acceptance of appreciable loss in total readiness.

(3) *Industrial comparisons.* Since 1974 the size and value of the laidaway base have more than doubled due to

deactivations and inflation. Costs of basic standby elements, such as utilities and personnel, have also risen dramatically. The overall dollar resources committed to the base, however, have remained static. An analysis by ARRCOM indicates that the maintenance resource commitment to the inactive base should be on the order of 1 percent of the base replacement value; however, funding has averaged until recently approximately .05 percent of the replacement value.

3–5. Storage system.

a. Following is a list of all Army DESCOM depots which store conventional, as well as other munitions, for the Army, Air Force, Navy, and Marine Corps in CONUS as of 31 December 1981. This list excludes upload areas, training areas, and other small storage areas. The net square feet data were extracted from the JCAP Storage Manager's Handbook and the DA Storage Space Management Report. Capacity data are based on optimal storage conditions.

Table 3–1
Army DESCOM Depots Storage Capacities—CONUS

Location	Net Square Feet (thousands)	Storage Capacity (short tons)
Anniston Army Depot	3,995	570,714
(Anniston Army Depot)	(2,272)	(324,571)
(Lexington Blue Grass Army Depot Activity)	(1,723)	(246,143)
Letterkenny Army Depot	3,744	534,857
(Letterkenny Army Depot)	(1,679)	(239,857)
(Savanna Depot Activity)	(2,065)	(295,000)
Tooele Army Depot	9,110	1,301,429
(Tooele Army Depot)	(2,227)	(318,143)
(Pueblo Depot Activity)	(1,975)	(282,143)
(Fort Wingate Depot Activity)	(1,096)	(156,571)
(Navajo Depot Activity)	(1,634)	(233,429)
(Umatilla Depot Activity)	(2,178)	(311,143)
Red River Army Depot	1,354	193,429
Seneca Army Depot	1,439	205,571
Sierra Army Depot	2,745	392,143
CONUS TOTAL	22,387	3,198,143

b. These CONUS depots are operated by DESCOM located at Chambersburg, Pennsylvania, a subordinate command of DARCOM. ARRCOM also operates three formal naval installations with about 1.8 million short tons capacity, as well as plants and arsenals with a total of slightly under 0.5 million short tons capacity. Collectively, this represents about 5.5 million short ton capacity in the CONUS Wholesale System. Figure 3–7 displays CONUS ammunition storage locations geographically. An assessment of the capability of the CONUS depots to effect resupply to an active theater of operations at currently envisioned rates resulted in identification of deficiencies in materiel handling and communications/ADP capabilities. Resources to correct these deficiencies are the subject of continuing review in the planning, programing, and budgeting cycle.

c. Each major OCONUS commander has various ammunition storage facilities under his direct responsibility/command—

(1) *Pacific Area.* As of 31 December 1981, the Pacific Area had about 605,000 short tons of storage capacity, which was concentrated primarily in Japan and Korea as follows:

Table 3–2
Army DESCOM Depots Storage Capacities—OCONUS (Pacific)

Location	Net Square Feet (thousands)	Storage Capacity (Short tons)
Japan:		
Akizuki Army Depot	304	46,429
(Akizuki Army Depot)	(169)	(24,143)
(Kawakami Depot Activity)	(100)	(14,286)
(Hiro Depot Activity)	(56)	(8,000)
Korea:		
SALS–K Installations (29)	3913	558,955
PACIFIC TOTAL		605,384

(2) *European Area.* As of 31 December 1981, USAREUR had 838,000 short tons of storage capacity on the continent and in the United Kingdom. The largest of the sites was as follows:

Table 3–3
Army DESCOM Depots Storage Capacities—OCONUS (Europe)

Location	Net Square Feet (thousands)	Storage Capacity (short tons)
United Kingdom		
Bramely	689	98,429
Caerwent	573	81,857
Italy		
Camp Darby	334	47,714
Benelux		
Sugny	66	9,429
Barronville	110	15,714
Germany		
Miesau/Weilerbach	1,860	265,714
Saarland Sites (4)	98	14,000
Fischbach	196	28,000
Bruchsal	168	24,000
Dahn	131	18,714
Kriegsfeld	150	21,429
Muenster	110	15,714
Bamberg	102	14,572
Koeppern	270	38,571
Viernheim	155	22,143
Other	854	122,000
EUROPE TOTAL	5,866	838,000

Notes:
The other capacity (122,000 short tons), listed above, is spread among 30–plus sites whose individual capacities range from medium to very small.

d. Each major command (CONUS and OCONUS) requisitions ammunition directly from the National Inventory Control Points (ARRCOM for conventional munitions and MICOM for missiles). CAMO-PAC performs this function collectively for the Pacific. These requisitions are analyzed by the NICP to determine the location for most cost-effective shipping, considering age, type, condition, lot size, and quantity.

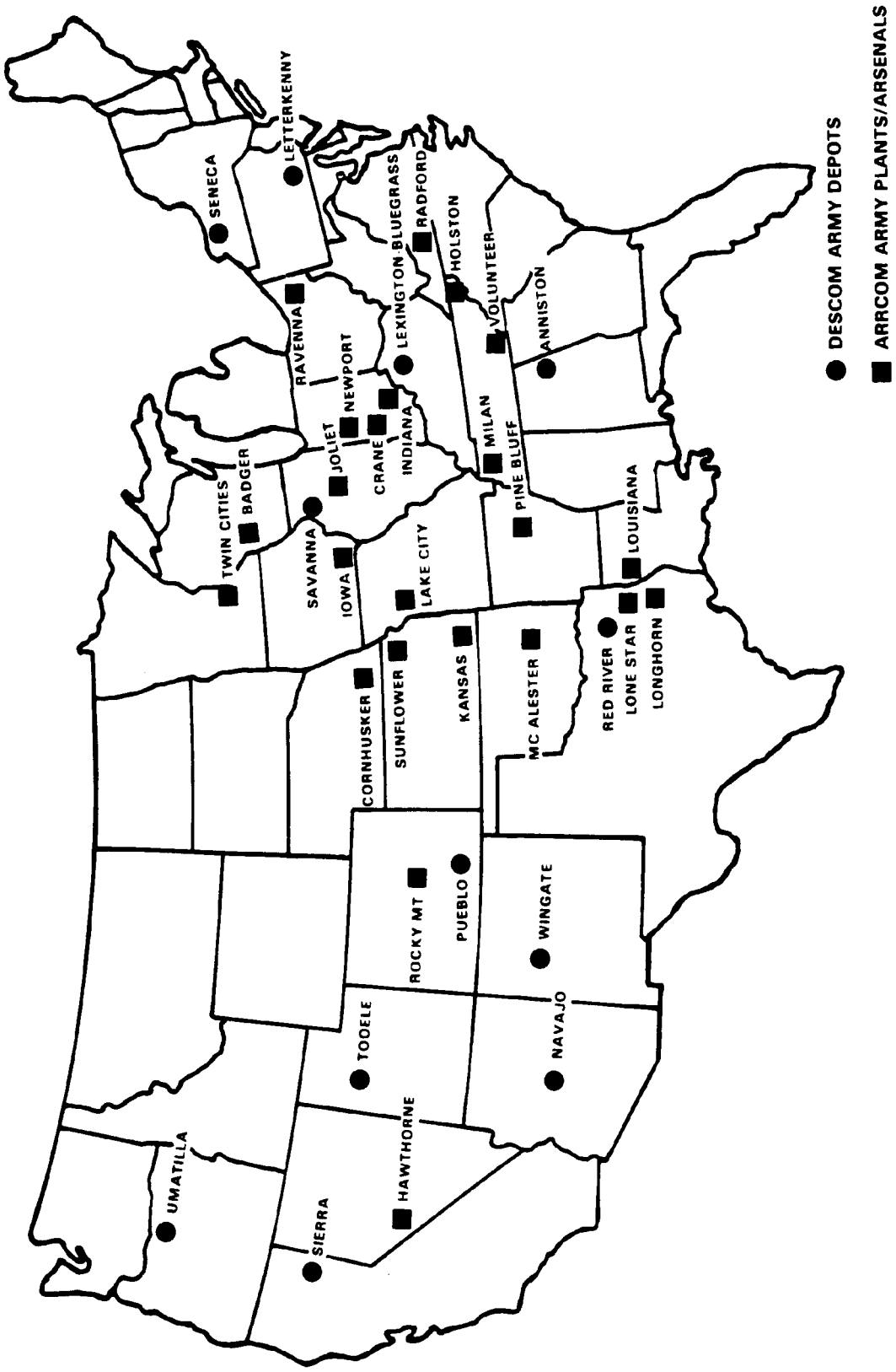


Figure 3-7. CONUS Ammunition Storage Locations

3–6. Transportation system.

a. The transportation system that provides for the movement of Army ammunition is essentially the same in peace or war. The principal difference between current resupply operations and an emergency or mobilization situation is in the quantities of ammunition moved.

b. Specific export shipment procedures are displayed in figure 3–8 and include the following:

(1) ARRCOM (NICP) receives the requisitions and determines asset availability and special consideration such as the necessity for shipping from specific sites or to meet specific ammunition characteristics. Based on that data, source/terminal cost analyses are made to determine which shipping source will provide lowest overall landed cost consistent with customers' requirements. Also, during this process, the requirements are assembled into shipload segments. It should be noted that during mobilization, the theater priority, depot assets and capabilities, carrier equipment, ship berthing dates, and terminals will also impact on selection of the supply sources.

(2) Having accomplished these tasks, ARRCOM requests (through the appropriate MTMC area command) MSC to berth a ship at the cost effective terminal on a date consistent with customer requirements, supply source, and carrier capabilities.

(3) Once a confirmed ship on berth date is received, ARRCOM prepares a ship planning message through semiautomated means. This message, dispatched to the several activities indicated in figure 3–8, provides a complete listing of the ammunition planned for that ship, an estimated overseas arrival date, and the destination terminal. The data in the message is retained on file in the SMCA computer as the data base for an intransit visibility file.

(4) The planning message also serves as a cargo offering to MTMC for routing purposes, and MTMC automatically releases the requisitioned items for movement from the supply source to the loading terminal. This precludes the shippers from having to request release of each shipment unit. As the material is shipped, the shippers transmit reports of shipment (REPSHIP) to all concerned parties. Terminals and overseas consignees use the information to plan their operations and storage requirements.

(5) After the loaded ship sails, an advance report of shipment is sent to all customers providing any known changes in tonnages planned versus loaded. When the manifest for that ship is received by ARRCOM, it is reconciled with the planned load, the intransit visibility file is updated, and a final report of shipment is dispatched. Subsequently, when the ship arrives at its first overseas port of call, the intransit file is updated to show that the ammunition is in transit in the theater.

(6) The system provides intransit visibility from the time of requisition until the ammunition is received in the overseas theater. This visibility provides the customer with a continuing status of ammunition items that are received in the theater. It also provides the overseas commander the flexibility to divert intransit ammunition consistent with combat needs or other requirements. Likewise, it facilitates planning for direct movement to theater locations bypassing storage depots, provides constant intelligence on inbound ammunition shipments, and provides firm planning data to allow scheduling of intertheater transportation.

(7) The procedure described above, which is largely a manual one, has been in use for over 12 years. Modeling and other computer-assisted techniques are being developed and analyzed for adoption by ARRCOM with the objective of enhancing system responsiveness.

c. Ammunition is normally moved by surface modes of transportation. Because of the substantial amounts of ammunition required to support large force deployments, intertheater movement of ammunition resupply by airlift will be on an exception basis. Intertheater airlift is the responsibility of the Military Airlift Command (MAC) (US Air Force).

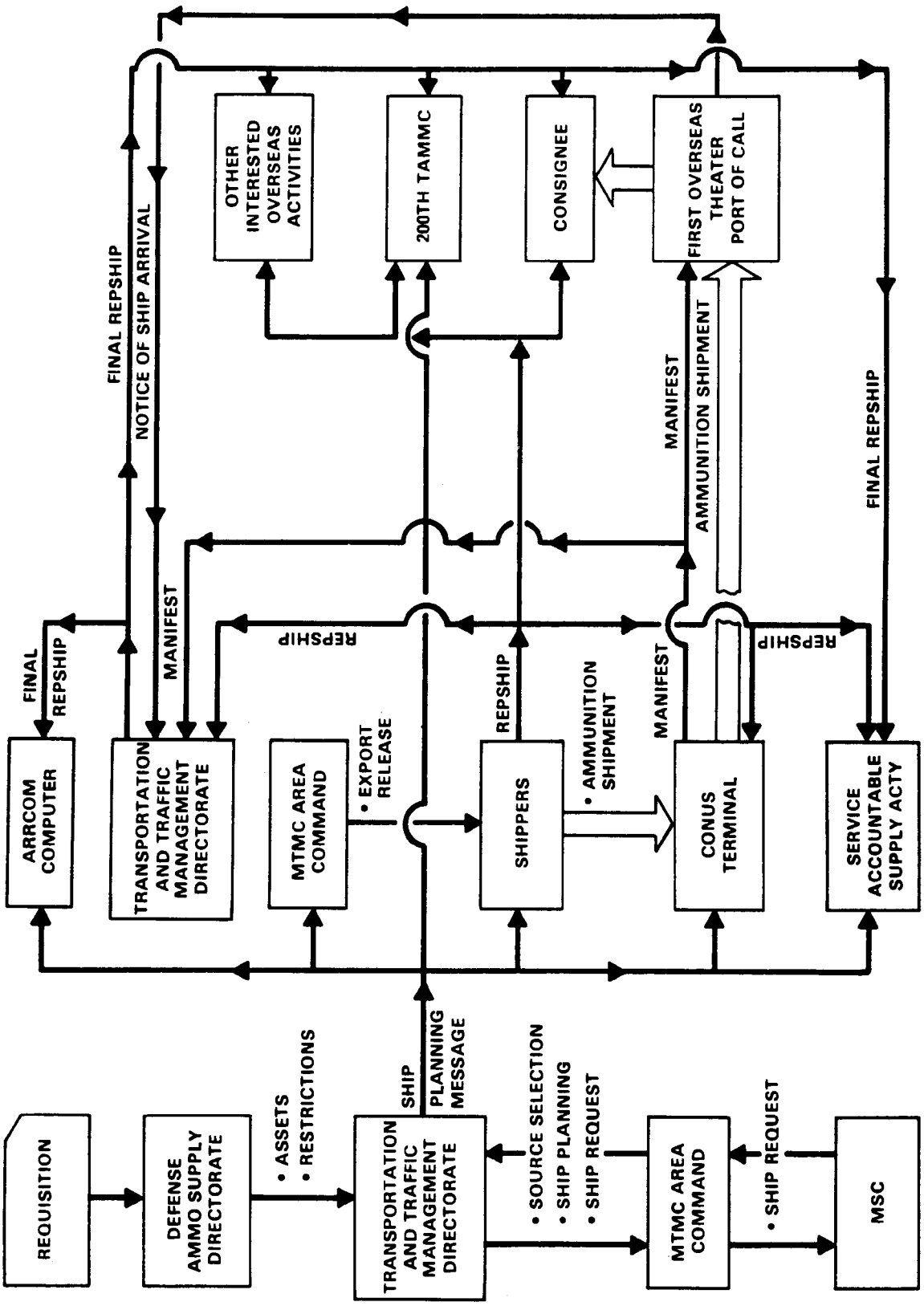


Figure 3-8. Export Shipment Procedures

d. The extensive US commercial surface transportation industry moves Army ammunition from its origin at a production plant or depot to the air or sea port of embarkation. The US rail system transports the majority of the Army ammunition tonnages, supplemented by the commercial trucking industry. The inherent capability of rail transportation to sustain the movement of large tonnages enables this mode to be highly effective and efficient. The responsiveness and flexibility of truck transport makes this mode more suitable for the movement of small lot shipments to seaports and high-priority shipments to air ports of embarkation. The current capacity of the US commercial surface transportation system is adequate to meet known emergency or mobilization military transportation needs.

e. While the physical capacity of the transportation system is adequate, experience indicates that the rail system needs rehabilitation. To correct this weakness in the system, the Army has developed a Railroads for National Defense Program, which identifies a network of strategic rail corridors and is intended to improve rail lines in those corridors. Analyses of the outloading capabilities of ammunition shipping installations are made periodically, and facilities, which are determined to be required, are then included in the DARCOM modernization plan.

f. The connecting link between the Army shipper (ammunition depot or plant) and the commercial transportation industry is provided by MTMC. MTMC serves as DOD's traffic manager in CONUS as well as common-user ocean terminal service operator in CONUS and certain overseas ports.

g. Ammunition is outloaded for oversea shipment at US ammunition ports. The current ammunition outloading capability at these ports is expressed below in terms of sustained ship outloading capability.

Table 3–4
Sustained Ship Outloading Capability

	Breakbulk		Container	Total
Military Ocean Terminal (MTMC), Kings Bay, GA (Transferred to USN 1 Jul 78)	1		—	1
Military Ocean Terminal (MTMC), Sunny Point, NC	4	or	1	4
Naval Weapons Station (USN), Earle, NJ	3			3
Naval Weapons Station (USN), Concord, CA	2			2
			Total	10

h. The Army recognizes that the current CONUS ammunition port outloading capability is insufficient to meet known requirements. Construction is underway to upgrade Military Ocean Terminal, Sunny Point, to a sustained loading capability of six ships— two containers and four breakbulk vessel support systems. For these improvements, projects costing $32.0 million were approved by Congress in 1979 (FY80). The Navy has agreed to upgrade the capability of NWS Earle to sustain the outloading of six ships. Resources have been programed by the Navy for this purpose. The Army transferred the ammunition facilities at Kings Bay to the Navy effective 1 July 1978 for use as a submarine base.

i. The MSC (US Navy) is responsible for providing sealift support to the services during both peace and war. MSC is also responsible for the development of plans and techniques which would enable the expansion of sealift capabilities during emergencies or mobilization. The US capability to rapidly expand sealift assets during emergencies comes from three principal sources:

(1) the MSC nucleus dry cargo fleet (27 government-owned or chartered ships), which is DOD's organic common-user sealift capability;

(2) the National Defense Reserve Fleet (NDRF) (149 ships), administered by the Maritime Administration, is a standby capability of largely older commercial merchant ships maintained in various states of readiness to support national emergencies or contingencies; and finally,

(3) the US Merchant Marine provides the bulk (288 ships) of the ready sealift capability to support military operations. During emergencies short of mobilization, US flag ship owners are committed to provide sealift resources (125 ships) to MSC under the Sealift Readiness Program. Upon mobilization, the US flag fleet can be requisitioned for defense purposes. Additionally, during a NATO emergency, it is planned that part of the sealift support to reinforce NATO will be provided by NATO-member merchant fleets.

j. Upon arrival in the oversea theater, Army ammunition is offloaded from ships at either military or commercial (host nation) ports and moved to destination by military or civilian contract truck assets and/or host nation(s) rail system. Host nation inland waterway transportation can also be used when advantageous. Control of host nation commercial transportation assets is exercised by that nation, and during wartime the allocation of resources to US forces is normally determined by US-host nation agreements. US unified commanders are responsible for the control, allocation, and management of US military transportation assets and for coordinating use of host nation civilian transportation assets. In Korea, munitions offloading and transporting to inland destinations is an ROKA responsibility and is performed under the SALS–K Memorandum of Agreement.

k. The procedures and techniques used to provide transportation service during peacetime are intentionally similar to

those needed to meet the vastly expanded demands of an emergency or mobilization. Army requirements, together with those of the other Services, are examined from a transportation standpoint in the joint planning process. Various analytical techniques are used to test transport capabilities, identify system shortfalls, and recommend improvements. The three military transportation operating agencies (MTMC, MAC, and MSC) and the oversea commanders maintain liaison and coordination with the commercial carriers and Governmental agencies involved in providing the Army its transportation support. Through these efforts, the Army is able to keep abreast of system changes, to evaluate their impact on Army requirements, and to take action when necessary.

l. A major challenge facing the Army is to determine the proper level of containerization for the Army ammunition distribution system. Containerization affects the entire ammunition distribution system from production plant to firing battery with transportation being only one aspect of the system. A total systems approach has been initiated to achieve a throughput capability for containerized. conventional munitions of 1,000 containers per day. Ammunition plant and depot modernization programs are being developed by DARCOM to support this requirement and to correspond with the port modernization program.

Chapter 4
DETERMINATION OF CONVENTIONAL AMMUNITION RATES AND REQUIREMENTS

4–1. Ammunition rates determination process.

a. Reference. AR 710–8, dated 3 January 1975.

b. General. Scenarios, rates, force structure, and unit deployments are the driving factors for determination of ammunition acquisition and distribution objectives. Types of rates currently in use and the evolution of rate determinations are described in the following sections.

c. Definitions.

(1) *Ammunition rate.* A quantity expressed in rounds or units, per weapon, per day. For bulk allotment items, it is expressed in other units of measure, such as each or pounds per 1,000 men per day.

(2) *Programing rate (P–Rate).* A theater combat rate developed to assist the ARSTAF in determining the ammunition requirements for the last year of the POM.

(3) *Distribution rate (D–Rate).* A theater combat rate developed to assist the ARSTAF and MACOM commanders in determining the type and quantity of ammunition which will be made available to the designated MACOM. This asset constrained distribution requirement is normally developed and issued for the near term as a basis for actual distribution actions.

(4) *Requirement rate (R–Rate).* A theater combat rate developed to assist the ARSTAF in determining the ammunition requirements for the near term; actually a near-term P–Rate.

Note. The concept of an R–Rate study will be of utility in the asset distribution decision process.

d. Policy.

(1) One or more sets of theater combat rates will be developed, as required, for use in planning the distribution of current assets (distribution rates/D–Rates) and for use in procurement and production base support planning and programing (program rates/P–Rates).

(2) Theater combat rates (P– and D–Rates) will be reviewed at least annually, and revised as often as required to reflect—

(a) New concepts of organization and/or operations.

(b) Introduction of improved weapons and ammunition (modernization).

e. Concept. Theater combat rates will be used for the following purposes:

(1) *Distribution Rates (D–Rates).*

(a) As a basis for determining theater war reserve levels authorized by AR 11–11 and for validating MACOM requisitions.

(b) As a guide for computing resupply of active oversea commands.

(c) As a guide for establishing initial stockage and resupply in a newly activated theater.

(2) *Programing rates (P–Rates).* As a basis for computing the ammunition AAO.

(3) *Requirement Rates (R–Rate).*

(a) As a basis for computing the line-by-line PWRMS requirement which will be reviewed by HQDA for item availability.

(b) As the basis for theater storage objectives, storage facilities construction programs, call forward programs, and both follow-on requisitioning and distribution transactions.

(c) A consistent statement of the true requirement for a given theater.

f. Responsibilities.

(1) The DCSOPS (DAMO–RQ) has primary DA Staff responsibility for the development of theater combat ammunition rates.

(2) The DCSLOG (DALO–SM) has DA Staff responsibility for publishing SB 38–26, which contains the DA-approved D–Rates for the theaters for a specified timeframe, and for computing ammunition distribution requirements based on the approved D–Rates or R–Rates.

(3) The DCSRDA (DAMA–PPP in coordination with DAMA–CSM) has DA Staff responsibility for computing the ammunition AAOs based on approved P–Rates

g. Approval. Recommended P–Rates, D–Rates, and R–Rates are developed by ODCSOPS in coordination with the DA Staff and approved by the ODCSOPS chaired Study Advisory Group (SAG).

4–2. Ammunition programing requirements.

a. Reference. AR 710–8, dated 3 January 1975.

b. Ammunition Programing (P–Rate) Study. An ammunition programing (P–Rate) study will be conducted on an as-required basis dependent on the results of the ODCSOPS (coordinated with DA Staff) annual review of the current study and its application to the last year of the upcoming POM period. Study data in the annual review will include—

(1) US Forces/Units (size/composition).

(2) US deployment sequence.

(3) US weapon/munition lists.

(4) US tactics and doctrine.

(5) Scenario, threat, and deployment sequence.

(6) Study assumptions (example: warning/mobilization time).

(7) OSD guidance for upcoming POM period.

c. Annual review. The annual review could result in selected weapon system rates being changed as opposed to conducting a new ammunition programing study. Selected rate changes would be coordinated with the DA Staff and approved by DCSOPS.

d. Decision. When a decision is made to conduct an ammunition programing study, the following sequence of events will occur—

(1) DA Staff and MACOM notified of upcoming study effort.

(2) Study Advisory Group (SAG) formed by ODCSOPS (DAMO–RQ). Members of the SAG will include representatives from OASA(RDA), ODCSLOG, ODCSRDA, OACSI, OCSA(PA&E), DARCOM, TRADOC, CAA, and the appropriate theater.

(3) SAG develops and approves the study tasker, to include the objectives, scope, and assumptions, and then forwards the tasker to CAA for conduct of the study (DAMO–RQ).

(4) SAG meetings are conducted on an as-required basis with the primary emphasis on advising and providing assistance to CAA in the study effort.

(5) Major input data for the programing study reflects the force structure, equipment, and ammunition scheduled to be employed by the force in the last year of the POM. Since the focus of the study is on the last year of the POM, equipment, both modern and existing, is played to the extent that it will be fielded. Ammunition played will include both modern and selected existing munitions.

(6) SAG will make rate changes as required to compensate for new developments which would normally have changed one or more of the major study assumptions. Justification for each rate change will be fully documented.

(7) Proposed P–Rates are staffed and presented to ODCSOPS for DA Staff approval.

e. Computation of ammunition programing requirements.

(1) DA-approved P–Rates are provided by ODCSOPS(DAMO–RQ) to ODCSRDA(DAMA–PP).

(2) ODCSRDA (DAMA–PPP in coordination with DAMA–CSM) will determine the ammunition AAO based on the ODCSOPS (DAMO–FD) LOGSACS file/computer tape for the last year of the POM period. The LOGSACS file is reviewed/validated semiannually by the DA Staff. The validation process is conducted prior to the publication of the winter and summer LOGSACS file, with the file being available to the "users" about 1 July and 1 December. In addition to force size and composition this file will contain the deployment sequence based on a scenario directed by OSD. (See app B for detailed discussion of LOGSACS.)

4–3. Ammunition distribution requirements.

a. Reference. AR 710–8. dated 3 January 1975.

b. Ammunition distribution (D–Rate) study. An ammunition distribution (D–Rate) study will be conducted on an as-required basis dependent on the results of the ODCSOPS (coordinated with DA Staff) annual review of the current studies. Study data in the annual review will include—

(1) US Forces/Units (size/composition).

(2) US deployment sequence.

(3) US weapon/munitions lists.

(4) US tactics and doctrine.

(5) Scenario, threat, and deployment sequence.

(6) Study assumptions (example: warning/mobilization time).

(7) OSD and Army guidance or applicable allied force structures and tactical doctrine.

c. Annual review. The annual review could result in selected weapon system rates being changed as opposed to conducting a new ammunition distribution study. Selected rate changes would be coordinated with the DA Staff and appropriate theater commander and approved by ODCSOPS.

d. Decision. When a decision is made to conduct an ammunition distribution study, the following sequence of events will occur—

(1) DA Staff and MACOM notified of upcoming study effort.

(2) SAG formed by ODCSOPS (DAMO–RQ). Members of the SAG will include representatives from OASA(-RDA), ODCSLOG, ODCSRDA, OACSI, OCSA(PA&E), DARCOM, CAA, and the appropriate theater.

(3) SAG develops and approves the study tasker, to include the objectives, scope, and assumptions, and then forwards the tasker to CAA for conduct of the study (DAMO–RQ).

(4) Major input data for the distribution study reflects the force structure, equipment, and ammunition scheduled to be employed by the force during the year of the study. ODCSOPS (DAMO–RQL) will, in connection with the ammunition program analyst (DAMA–CSM), validate the ammunition to be played and specify which munitions will be "capped" at specific quantities.

(5) SAG meetings are conducted on an as-required basis with the primary emphasis on advising and providing assistance to CAA in the study effort.

(6) CAA submits the ammunition distribution rates to the SAG for review. On completion of SAG review, proposed distribution rates are forwarded to appropriate theater commander for comment.

(7) The DA staff and SAG analyzes the theater's input, with supporting rationale, and applies rate changes where appropriate.

(8) CAA provides proposed distribution rates to ODCSOPS (DAMO–RQ) for DA Staff approval.

e. Computation of ammunition distribution requirements.

(1) ODCSOPS (DAMO–RQ) furnishes DA-approved D–Rates to ODCSLOG (DALO–SM).

(2) ODCSLOG forwards the distribution rates to DESCOM where the rates are applied to the appropriate fiscal year LOGSACS file/computer tape to include the deployment sequence for determining ammunition stockage levels. The LOGSACS file/computer tape will basically be the same one used by CAA in their computation of the D–Rates.

(3) An ARSTAF committee chaired by ODCSOPS (DAMO–RQ) reviews the distribution rates to determine those ammunition items which may require a change in rate due to changes in force structure, threat, scenario, etc.

(4) Promulgated distribution rates are published in Supply Bulletin 38–26 (DALO–SM).

4–4. Training ammunition requirements.

a. References. AR 350–1, dated 25 April 1975, and AR 350–4, dated 24 September 1973.

b. Definitions.

(1) *Training ammunition.* Supply Class V items consumed during training. It includes both training-unique and service ammunition, explosives and pyrotechnics. It does not include ammunition expended for purposes other than training such as—

(a) Research, development, test, and evaluation (developmental and user testing).

(b) Disposal.

(c) Environmental hazard control.

(d) Military interments.

(e) Saluting.

(f) State security.

(g) Weapons calibration and test.

(h) Wildlife protection.

(i) Guard duty.

(j) Emergency signals.

(k) Law enforcement.

(l) Rock quarry operations.

(m) Road repairs and construction.

(n) Other activities even though incidental training value may be gained.

(2) *Training-unique ammunition.* Ammunition which has no battlefield use and is procured solely for the purpose of training.

(3) *Training Ammunition Management System (TAMS)(AR 5–13).* A comprehensive system for the management of

training ammunition focusing on the determination of requirements and efficient management of authorizations. TAMS is designed to operate within the framework of the Planning, Programing, and Budgeting System.

(4) *The Training Ammunition Authorization Committee (TAAC).* A continuing standing committee of the Department of the Army organized under the provisions of AR 15–20, composed of senior representatives of the Army Staff and major commands. Its purpose is to validate Army training ammunition requirements and to make recommendations to DCSOPS concerning their incorporation into ammunition procurement programs.

c. Procedure.

(1) Initial guidance regarding training goals and draft training ammunition authorizations will be provided by HQDA in Program and Budget Guidance (PBG).

(2) MACOMs and the Army National Guard (ARNG) present proposed requirements to the TAAC. The TAAC will consider training ammunition requirements and address the impact of shortfalls on the attainment of training goals. TAAC-validated requirements will form the basis for training ammunition input into the Army Materiel Plan (AMP).

(3) MACOMs which participate in the programing cycle may submit their unsatisfied ammunition requirements for the first year of the five program years in their Program Analysis and Resource Review (PARR). These PARR issues are reviewed by the Army Staff and presented through the Program Budget Committee (PBC) and Select Committee (SELCOM) to the CSA and SA for review and approval.

(4) The POM is prepared concurrently with the program review and approval process and includes the training ammunition program. As ammunition procurement programs are modified by the formulation of the OSD and President's Budget, and congressional action, draft ammunition authorizations will be provided MACOMs and the ARNG for further review.

(5) If complete funding of training ammunition programs is not provided, ODCSOPS, in coordination with ODCSLOG and ODCSRDA, will determine the amount that war reserve stocks can be drawn down to satisfy training needs without unacceptable degradation of force readiness. Such war reserve assets may be applied against unfunded training ammunition requirements.

(6) Prior to the beginning of the fiscal year, the TAAC will meet to consider requirements and budget decisions on the Army Materiel Program. Final MACOM and ARNG authorizations for the budget year will be made. MACOMs and the ARNG will subauthorize to elements of their commands and the several states, respectively, in accordance with DA guidance, MACOM and ARNG determination of priorities, needs, and local conditions. The subauthorization process will continue to unit level.

(7) Requirements for training-unique ammunition to support Reserve component unit training subsequent to mobilization and prior to deployment are developed by FORSCOM and the ARNG, approved by ODCSOPS, and furnished to ODCSRDA for inclusion in annual procurement requirements.

(8) Unless prohibited or restricted by command or ARNG policy, any commander may adjust the ammunition authorization for his command to meet the needs of his training program provided only that—

(a) the total dollar value of the authorization is not exceeded and

(b) the change is supportable from the ammunition stockpile. The dollar value of authorizations and individual ammunition items will be included within the TAMIS data base. Annual authorizations to MACOMs and the ARNG may include a permissible quantity by which authorizations of individual items may be increased without DA approval. This quantity will be based on a comparison of asset posture and operational war reserve requirements.

(9) Supplemental authorizations to MACOMs and the ARNG may be approved by HQDA to meet onetime requirements which cannot be supported from within existing authorizations and are essential to the furtherance of the MACOM or ARNG mission. Normally such supplemental authorizations will be approved only when the requirement supports an HQDA directed tasking made subsequent to the approval of annual authorizations.

(10) Ammunition items experiencing, or forecast to experience, demands exceeding supply availability will be allocated, distributed, and/or redistributed by the Committee for Ammunition Logistical Support (CALS) in accordance with AR 15–16.

d. Responsibilities.

(1) ODCSOPS is responsible for the overall management of training ammunition and TAMS (DAMO–TRS); monitoring the overall ammunition system to ensure integration of all requirements and the assignment of appropriate priorities (DALO–RQR); defending the funding of training requirements (DAMO–TRS); assessing, in coordination with ODCSLOG and ODCSRDA, whether war reserve stocks can be drawn down to satisfy training ammunition requirements without unacceptable degradation of force readiness (DALO–RQL); and establishing priorities between competing claimants when training ammunition authorizations and/or availability are less than requirements (DAMO–TRS).

(2) ODCSLOG is responsible for policy formulation regarding maintenance, care, renovation, and distribution of training ammunition.

(3) ODCSRDA is responsible for the development and defense of ammunition procurement programs; overall management of a research and development program that will facilitate the fielding of systems, training devices, simulators, and training-unique items to enhance training; and providing ODCSOPS with information on procurement

programs and assets to enable ODCSOPS to assess if contingency stocks can be drawn down to satisfy training ammunition requirements, or if additional procurement should be considered.

(4) FORSCOM is responsible for the determination of training unique ammunition requirements for post-mobilization/predeployment training.

4–5. War reserve stocks for allies.

a. Reference. AR 11–11(C), Army Programs, War Reserves(U), 1 February 1979 (under revision).

b. Definition. War Reserve Stocks for Allies (WRSA). WRSA consists of OSD-directed programs to ensure US preparedness to assist specific allied countries in the event of war. WRSA remain US owned and controlled until transferred in accordance with the Foreign Assistance Act of 1961 and International Security Assistance Acts, as amended. The WRSA is based on guidance from the Secretary of Defense as implemented by HQDA.

c. Concept. ODCSOPS provides the HQDA-approved force structure and weapons densities to be supported to ODCSRDA and ODCSLOG. ODCSRDA and ODCSLOG compute munitions programing and distribution requirements based on the number of days to be supported as specified in OSD guidance. This gross requirement is then reduced (offset) by the allied countries' assets applicable to war reserve. This net requirement becomes the WRSA portion of the US total AAO.

d. Responsibilities.

(1) *ODCSOPS—*

(a) Has primary responsibility for preparing and coordinating the overall WRSA program.

(b) Annually revalidates the supported allied force structure, the type items, and quantities by line item that are to be supported and forwards the validated list to ODCSLOG, ODCSRDA, and DARCOM.

(c) Prescribes ammunition rates to be used.

(d) Establishes programing priorities for WRSA Program in the DA Programing Priorities List (DAPPL) and Army priorities for programing.

(e) Establishes distribution priorities for WRSA Program in the DA Master Priority List (DAMPL).

(2) *ODCSLOG—*

(a) Assists in the validation of WRSA.

(b) Distributes ammunition assets to WRSA in accordance with Department of the Army Master Priority List/ Department of the Army Program Priority List (DAMPL/DAPPL).

(c) Maintains status of WRSA assets in accordance with OSD and Army guidance.

(d) Develops requests for ceilings to be used to add ammunition to WRSA.

(3) *ODCSRDA—*

(a) Computes WRSA requirements and incorporates in the AAO, and plans, programs, and budgets PAA based on OSD and Army guidance.

(b) Assists in WRSA requirements computations and the validation of WRSA.

(4) *WRSA Review and Validation Committee—*

(a) Meets annually to validate the allied force structure and supported items and submits to ODCSOPS for approval and forwarding to ODCSLOG, ODCSRDA, and DARCOM.

(b) The committee consists of a representative from ODCSOPS (chairperson), ODCSLOG, ODCSRDA, OTSG, and OCSA(PA&E) with representation from EUSA, WESTCOM, DARCOM, OACSI, OCA, and OCE when requested by committee chairperson.

(c) The committee will meet at the call of the chairperson.

4–6. Special contingency stockpile.

a. Reference. AR 11–11(C), Army Programs, War Reserves(U), 15 January 1982.

b. Definitions.

(1) Special contingency stockpile. A CONUS stockpile to meet urgent unforeseen security assistance requirements. Special contingency stockpile remains US owned and controlled until transferred under the Foreign Assistance and International Security Assistance Acts.

(2) The special contingency stockpile is based on guidance from the Secretary of Defense as implemented by HQDA.

c. Concept.

(1) For items for which there is a specified daily consumption rate, that figure times the specified support period equals the requirement.

(2) For items for which there is no specified daily consumption, the US NATO 90–day intense rate times the weapons density times the specified support period is used to compute the requirement.

d. Responsibilities.

(1) *ODCSOPS—*

(a) Has primary responsibility for preparing and coordinating the overall SCS Program.

(b) Annually revalidates special contingency stockpile ammunition items and forwards stockage level to ODCSLOG, ODCSRDA, and DARCOM.

(c) Computes the required special contingency stockpile ammunition levels in accordance with OSD and Army guidance. Prescribes ammunition rates to be used.

(d) Establishes programing priorities for SCS Program in DAPPL and Army priorities for programing.

(e) Establishes distribution priorities for SCS Program in DAMPL.

(2) *ODCSLOG—*

(a) Assists in the validation of special contingency stockpile.

(b) Distributes ammunition assets to special contingency stockpile in accordance with DAMPL/DAPPL.

(c) Maintains status of special contingency stockpile assets in accordance with OSD and Army guidance.

(3) *ODCSRDA—*

(a) Incorporates special contingency stockpile requirements into the AAO, and plans, programs and budgets Procurement of Ammunition, Army Appropriation based on OSD and Army guidance.

(b) Assists in special contingency stockpile requirements computations and the validation of the special contingency stockpile.

(4) *WRSA Review and Validation Committee—* Meets annually to validate the special contingency stockpile stockage requirement and submit it to DCSOPS for approval and forwarding to ODCSLOG, ODCSRDA, and DARCOM.

4–7. Operational projects (non-POMCUS).

a. Reference. Change 14, AR 710–1, dated 12 April 1976.

b. Definitions.

(1) *Operational project.* An authorization for major commanders to acquire materiel for theater or CONUS stockage for the purpose of supporting specific operations, contingencies, and/or war plans.

(2) *Additive project.* Projects which consist of requirements in addition to initial issue allowances (MTOE, TDA, MTDA, and CTA). Additive projects automatically increase the AAO by the project quantities.

(3) *Nonadditive projects.* Projects which do not increase materiel acquisition objectives and are included in a Modification Table of Organization and Equipment (MTOE), Tables of Distribution and Allowances/Modification Table of Distribution and Allowances (TDA/MTDA), and common table of allowances (CTA).

(4) *Proponent.* An activity or agency which proposes an operational project and which is responsible for controlling and reporting the materiel required for the project.

(5) *Project section.* A subdivision or part of a complete operational project with separate areas of operation or different degrees of use or project implementation.

c. Policy.

(1) Operational projects are to support the requirements of major Army commanders for special needs over and above normal allowances.

(2) Initiators will take appropriate action to satisfy operational project requirements from existing authorizations, such as Theater War Reserves (AR 11–11) or other operational projects prior to requesting additional operational project authorizations.

(3) Materiel requirements for support of contingencies, civil relief, disturbances, or defense not otherwise covered by ARs will be determined by the major commanders in the area of operations.

(4) Guidance on the use of operational project stocks to meet peacetime requirements is contained in section II of chapter 8 of AR 710–1. Peacetime use of an operational project may occur only after DA approval (ODCSLOG).

d. Establishment of operational projects.

(1) The proponent of an operational project may be any MACOM, activity, or agency.

(2) Maximum coordination will be conducted between MACOM, Item Managers, and the Army Staff.

(3) To initiate or change a non-POMCUS operational project proponents will (AR 710–1, para 8–27)—

(a) Prepare a request (with justification letter) for establishment of a new project or change to an existing project.

(b) Prepare an Operational Project List of Items.

(c) Submit operational project proposal to DA and DARCOM jointly.

(d) At time of submission of a new or revised operational project, the proponents are authorized to establish a holding account for materiel available within the command which can be applied to the project.

e. ODCSLOG will—

(1) Provide staff guidance for review and approval of all DA operational projects in coordination with ODCSOPS (DAMO–OD).

(2) Coordinate operational projects and changes with the Army staff.

(3) Advise MACOM's of project disapproval or suspension.

(4) After DARCOM processing, staff and forward approved project to TAG for publication.

(5) Annually publish HQDA letter listing all authorized operational projects providing the Army Staff and MACOM's with the listing of all additive and nonadditive projects by reflecting "A," or "N," respectively.

f. HQ DARCOM will—

(1) Review all logistical aspects of the justification letter and proposed Letter of Instruction (LOI) for proposed or revised operational projects.

(2) Provide guidance to subordinate activities on project processing.

(3) Provide management information data to HQDA.

(4) Incorporate and consider approved operational projects in the DARCOM OPLANS developed to support contingency operations.

(5) Provide project codes to the US Army Equipment Authorizations Review Activity (USAEARA), as required.

(6) Submit overall analysis of the project proposal/change to HQDA for approval.

g. Funding. Funding for non-POMCUS operational projects is as set forth in the principal Item and Ammunition Portion—Policy and Guidance for Preparation of Part I of the AMP. Proponents requiring stocks for approved operational projects will budget and provide funds for supplies and equipment.

h. Stocks no longer required. When project stocks are no longer required, proponents will forward a letter to HQDA with a copy to HQ DARCOM requesting that the project be canceled.

Chapter 5
OTHER CUSTOMER SUPPORT

5–1. US customers.

a. Under the authority of the Secretary of Defense, the Secretary of the Army is assigned as the Single Manager for Conventional Ammunition (SMCA) within the Department of Defense with power to redelegate, within the Army, those authorities for performance of this function. The current organizational structure is portrayed in figure 5–1.

b. The US Army acts as the procurement agent for most munitions used commonly by the several DOD services plus many items used by only one service, and for foreign customers under security assistance programs.

c. Under the SMCA, the requirements for all Services and customers are aggregated. Budgeting is the responsibility of the separate services. Military Interdepartmental Purchase Requests (MIPR's) are submitted to the SMCA to procure the customer orders. Deliveries are made to the customer as stocks are produced, or the stocks are placed in storage under the SMCA custodial management.

d. Because the ammunition production base for many items is common to all services, this base must satisfy joint service peacetime requirements and also be able to expand to accommodate mobilization requirements for all services.

e. While there has been contact between services to dispose of the potential excess of one service and avoid unneeded procurements by others, there was no mechanism to identify a local need for one service to assets available in nearby storage belonging to another service.

f. Under the SMCA, the mechanism now exists and extensive savings of second destination transportation funds are made possible by avoiding cross-hauling of stocks.

g. Support by the SMCA requires that funding programs related to care, preservation, storage, management, and maintenance of the production base for conventional ammunition support the ammunition procurement programs and ammunition readiness for all customers.

h. The SMCA also supports the Treasury Department, Department of the Interior (avalanche control), and the Immigration Service Border Patrol. These requirements are generally received as funded requisitions. Army stock is maintained by replacement procurement orders.

5–2. Security assistance programs.

a. Security Assistance Programs, Military Assistance Program (MAP), and Foreign Military Sales (FMS) provide a source for other nations to acquire equipment and munitions for national defense without commitment of large capital outlay to a defense industrial base. These programs provide the basis for international mutual support and can be an effective element of US foreign policy implementation.

b. Security assistance requirements provide one means for maintenance of an active, prepared production base for combat-essential items currently not needed by the US in quantities sufficient to maintain production continuity. Additionally, certain economies related to production continuity help to reduce hardware unit costs.

c. Security assistance requirements also provide a means for disposal of stocks no longer needed in the US inventory. In addition to reduced storage costs, the cost of demilitarization is avoided,

5–3. Protection of US Stocks to ensure readiness.

a. The objective is to provide support to security assistance programs and other US customers while maintaining an adequate state of ammunition supply readiness.

b. To obtain these ends, it is essential that other customer requirements which are proposed for shipment from Army ammunition stock shall not reduce those stock levels below the greater of the Army Procurement or Distribution Objective unless an exception to policy is approved by ODCSOPS.

c. When another customer requirement, or a combination of requirements, will reduce Army stocks below the levels stated above, customer orders shall be furnished from procurement sources using normal leadtime unless otherwise approved by ODCSOPS, or other appropriate authority.

- **Secretary of the Army**

  (Assigned as SMCA by DOD Directive 5160.65)

- **Assistant Secretary of Army (RDA)**

  (Assigned SMCA policy matters by SMCA Charter)

- **Deputy Chief of Staff for Research, Development and Acquisition**

  (Assigned as the central focal point for integration and coordination of SMCA actions within the DA staff by SMCA Charter)

- **Commanding General, US Army Materiel Development and Readiness Command**

  (Delegated by SMCA Charter the authorities of the Secretary of Army for execution of SMCA operations with power to redelegate)

- **Executive Director for Conventional Ammunition (EDCA)**

  (Designated by CG, DARCOM and SMCA Charter for performance of the SMCA activities with power to carry out authorities assigned to the CG, DARCOM)

- **Commanding General, US Army Armament Materiel Readiness Command**

  (Delegated responsibility for the conduct of field operations for the SMCA by EDCA mission statement)

Figure 5-1. Single Manager for Conventional Ammunition (SMCA) Organizational Structure

5–4. Explosive ordnance disposal support.

a. Background. The mission of EOD, as outlined in AR 75–14/75–15, is to neutralize suspected or actual conventional, nuclear, chemical, biological, or improvised munitions items which have failed to function as designed or have otherwise become hazardous through damage or deterioration, and which present a threat to operations, installations, personnel, or materiel. Rendering safe and disposal may take many different forms, dependent on the location, size, and quantity, and condition of the munitions involved. US Army EOD personnel are trained to neutralize domestic as well as foreign munitions.

b. CONUS. The Department of the Army has delegated complete operational responsibility to HQ FORSCOM. HQ FORSCOM provides geographical coverage of CONUS with 50 EOD units positioned around the country. In CONUS, approximately one team per 3.5 million people or for each 85,000 square miles is used for peacetime staffing. Army EOD support is provided to all Army organizations, all DOD components and Federal, State, and local government on a 24-hour basis. HQ DARCOM has delegated all responsibilities for EOD tools, equipment, and publications to HQ ARRADCOM.

c. Theater responsibilities. Each MACOM has responsibilities to staff its command to handle EOD responsibilities. EOD units are recommended for every 30,000 US troops in the theater of operation during peacetime and additional units during wartime.

5–5. Rationalization, Standardization, and Interoperability.

a. General. Rationalization, Standardization, and Interoperability (RSI) programs and initiatives are governed primarily by AR 34–1 and AR 34–2. RSI is viewed as a means of increasing the capability of US and allied armies through the use of combined and integrated alliance resources to further national and alliance goals. As such, RSI programs and initiatives represent a commitment by the US Army to actions enhancing its own abilities to operate effectively within an alliance. The NATO Standardization Agreements (STANAGs) dealing with ammunition interoperability are listed in figure 5–2. In addition, there is an ABCA (America, Britain, Canada, Australia) Quadripartite Standardization Agreement (QSTAG) on 105mm tank gun ammunition (and cannon) as well as a Memorandum of Understanding, 31 March 1978, concerning 155mm ammunition (and cannon) for the quadrilateral countries (US, UK, FRG, and Italy). An advisory publication, ABCA Armies' Logistics Handbook—Part II, Catalogue of Common User Items of Combat Supplies, provides listings of common ammunition in chapter 5. Included in this publication is an acceptability matrix for ammunition between the ABCA Armies.

STANAG number	*Subject*
2002	Marking of Contaminated or Dangerous Land Areas
2034	Ammunition Supply Procedures
2143	Explosive Ordnance Reconnaissance/Explosive Ordnance Disposal (EOR/EOD)
2310	Small Arms Ammunition (7.62mm)
2316	Marking of Ammunition (Below 20mm)
2318	Charger for NATO 7.62mm Ammunition
2321	Ammunition Color Codes (20mm and above)
2322	Minimum Markings for the Identification of Ammunition
2329	Links for Use with NATO 7.62mm Cartridges
2818	Demolition Accessories
2928*	Land Forces Ammunition Interchangeability Catalogue (AOP-6)
3585	20mm Ammunition for M61 Weapons
4100	Ballistic Surveillance of Gun Ammunition
4136	20mm Ammunition for Cannon M139 (Hispano Suiza)

*Interoperability is limited to NATO Land Forces, in Emergency, in War.

Note. See AAP-4, Standardization Agreements and Allied Publications, for a complete listing of STANAG's and dates of latest editions and amendments.

Figure 5-2. Life Cycle of a Typical Round of Conventional Ammunition

b. North Atlantic Treaty Organization (NATO).

(1) The interoperability and standardization of ammunition within NATO is critically important to the improvement of operational capability, force flexibility, sustainability, and simplification of the logistic system. Dramatic progress has been made in certifying small arms, artillery, mortar, and tank gun ammunition for firing from US and allied weapons. The Army Ammunition Interoperability Plan (AAIP) was approved by the Department of the Army (DA) on 12 July 1979 which represented the first step toward the achievement of ammunition interoperability. The Army's initial efforts began in the summer of 1977 following a request from the Commander in Chief, the US Army Europe (CINCUSAREUR). Concurrently, the Joint Chiefs of Staff (JCS) identified NATO ammunition interoperability as the #2 and #3 priority goals for US forces in recognition that ammunition is the high tonnage component relative to resupply. In order to implement this plan, a prioritized methodology was formulated which allows a quick but thorough look at the specific tasks of the plan, while simultaneously initiating a close liaison effort among the developer, user, and logistics counterparts of our NATO allies.

(2) The specific methodology developed for training ammunition involved engineering analysis of all pertinent data available as a prerequisite to the establishment of a written Memorandum of Agreement (see figure 5–3 for MOA summary) between the US and individual NATO allies which would allow the interchange of ammunition during training exercises.

(3) The approach developed for combat is somewhat different. Using the appropriate Standard NATO Agreements (STANAGs) as the basis, the data are being updated, expanded into a 5–year plan, firing restrictions added and fire control information identified. These actions are designed to reevaluate and reduce many of the caveats associated with classifying ammunition stocks as condition code N, suitable for emergency combat. STANAG 2928, Land Forces Ammunition Interchangeability Catalogue (AOP-6) provides a guide for combat interchangeability of ammunition among NATO countries.

(4) The basic criterion for both training and combat is to disseminate the information to the user in the form of field manuals, technical bulletins, firing tables, and additions to computerized fire control systems. To date exchange firings have been conducted with the Federal Republic of Germany (GE) involving the 203mm howitzer. Additionally, a NATO Ammunition Interoperability Review (NAIR) has been drafted and submitted to the June 1980 Conference of National Armament Directors (CNAD). Individual NATO member countries are currently reviewing the NAIR.

US [2]	*155mm*	*175mm*	*203mm*	*81mm*	*4.2"*	*105mm Tank*
GE	X	X [3]	X			X
UK	X	X	X	X		X
CA	X			X		X
NL	X		X		X	
BE	X		X		X	X
FR	X					
NOR	X				X	X

Notes.

1. Other MOAs with Denmark, Italy, and Turkey are also under consideration.
2. For selected rounds.
3. Not interchangeable.

Figure 5.3. MOA status between US and NATO [1]allies.

c. ABCA initiatives. Each of the ABCA armies maintains standardization representatives in the other three countries actively monitoring ammunition/weapons developments and providing for flow of information between the members. Information matters considered for standardization and data on standardization hats may be routed through the standardization representative to the other ABCA countries to keep them apprised of R&D activities, to solicit comments, and to determine if a cooperative venture is desired. Subsequently, a request may be expressed for information, or there may be independent efforts going on in two or more countries and information may be exchanged on a coordinated basis, or a cooperative venture may result. In the ideal case, from a standardization viewpoint, there may be a desire to purchase another nation's weapon system, ammunition, or TDP. Usually one of the foregoing RSI efforts requires negotiation and subsequent approval in one form or another. Some of the more important existing or proposed agreements related to ammunition are listed in figure 5–4. A complete listing may be found in the ABC Armies Standardization Lists.

d. Production capability. In general, it is well known that some of our allies have the capabilities to produce US-designed ammunition. However, complete details are not available, nor is it positively known that those foreign countries which can produce, and are producing, to US designs, are doing so in strict conformance with the US TDP.

Name of project	*ABCA control number*	*Developing Army*	*Interested Armies*	*Type of Coop R&D*	*Date on list*	*Remarks*
155mm Cannon-Launched Guided Projectile (CLGP) (COPPERHEAD)	1-1-1-31	US	UK	Interdependent	1973	Signed UK/US MOU
			CA	Interdependent		
Project No. 1X664621D073			AS	Interdependent		
Ammo for Cannon 155mm Howitzer	1-1-1-32	US	CA	Interdependent	1974	
Project No. 1X664602D373			AS	Interdependent		
155mm Ammunition for Artillery Weapons	1-1-1-40	US/UK	US/UK	Coordination	1974	Signed Quadripartite Ballistics Agreement (US/UK/FRG/IT)
Improved Screening Smoke Cartridge for the 81mm Mortar (LOA)	1-1-6-3	US	CA	Interdependent	Dec 77	
External Ammunition Stores Management and Remote-Controlled Fuzing Subsystems for Attack Helicopters (ROC)	1-5-3	US	US	Interdependent		Provisionally entered on Stan List, Part 1. UK has bid for Interdependent R&D.
2.75-Inch Rocket Lightweight Launcher and Improved External Stores Rack (ROC)	1-5-3-	US	UK	Interdependent		US has yet to confirm this course.
2.75-Inch Rocket Smoke Warhead (ROC)	1-5-3-	US	UK	Interdependent		

Figure 5-4. Data Extracted from ABCA Armies Standardization Lists—Part 1—Cooperative R&D.

Appendix A
REFERENCES

A–1. Department of Defense regulations.

a. DOD Directive 5000.1, Major System Acquisition, 29 March 1982.

b. DOD Instruction 5000.2, Major System Acquisition Procedures, 19 March 1980.

c. DOD Directive 5154.4, The DOD Explosive Safety Board (DDESB), 24 January 1978.

d. DOD Directive 5160.65, Single Manager for Conventional Ammunition, 17 November 1981.

e. DOD Approved SMCA Charter, 26 February 1982.

A–2. Army regulations.

a. AR 5–13, Management: Training Ammunition Management System, 1 August 1979.

b. AR 10–5, Organizations and Functions: Department of the Army, 1 December 1980.

c. AR 10–11, Organizations and Functions: US Army Materiel Development and Readiness Command, 9 March 1977.

d. AR 10–41, Organizations and Functions: US Army Training and Doctrine Command, 27 June 1973.

e. AR 10–42, Organizations and Functions: US Army Forces Command, 15 April 1975.

f. (C) AR 11–11, Army Programs: War Reserves, 15 January 1982. (Downgraded from (S) to (C) by HQDA (DALO–SMW) message 131504Z Jun 80.)

g. AR 11–27, Army Programs: Army Energy Program, 20 July 1976.

h. AR 15–2, Boards, Commissions, and Committees: Department of the Army Allocation Committee, Ammunition (DAACA), 12 August 1968.

i. AR 15–16, Boards, Commissions, and Committees: Department of the Army Committee for Ammunition Logistic Support (CALS), 23 October 1974.

j. AR 15–20, Boards, Commissions, and Committees: Training Ammunition Authorization Committee, 8 February 1977.

k. AR 34–1, Standardization: US Army Participation in Internal Military Rationalization, Standardization and Interoperability (RSI) Programs, 15 October 1979.

l. AR 34–2, Standardization: Rationalization, Standardization, and Interoperability, 15 December 1980.

m. AR 55–355, Transportation and Travel: Military Traffic Management Regulation, 15 March 1969, with changes.

n. AR 70–1, Research, Development and Acquisition: Army Research, Development, and Acquisition, 1 May 1975, with change.

o. AR 70–10, Research and Development: Test and Evaluation During Development and Acquisition of Materiel, 29 August 1975.

p. AR 70–27, Research and Development: Outline Development Plan/ADM/DPM/DCP, 17 March 1975.

q. AR 70–41, Research and Development: Cooperation with Allies and other Nations in Research and Development of Defense Equipment, 1 June 1981.

r. AR 70–61, Research, Development and Acquisition: Type Classification of Army Materiel, 1 August 1978.

s. AR 71–2, Force Development: Basis of Issue Plans, 19 April 1976.

t. AR 71–3, Force Development: User Testing, 8 March 1977.

u. AR 71–9, Force Development: Materiel Objectives and Requirements (under revision: Final Draft 26 February 1981).

v. AR 75–14, Explosives: Interservice Responsibilities for Explosive Ordnance Disposal, 25 September 1973.

w. AR 75–15, Explosives: Responsibilities and Procedures for Explosive Ordnance Disposal, 1 November 1978.

x. AR 130–5, Army National Guard: Organization and Functions of National Guard Bureau, 8 December 1977.

y. AR 130–400, Army National Guard: Logistical Policies for Support, 5 January 1977.

z. AR 200–1, Environmental Quality: Environmental Protection and Enhancement, 20 January 1978.

aa. AR 220–1, Field Organizations: Unit Status Reporting (RCS JCS 6–11–2–1–6), 1 June 1981.

ab. AR 350–1, Training: Army Training, 1 August 1981.

ac. AR 350–4, Training: Qualification and Familiarization with Weapons and Weapons Systems, 24 September 1973.

ad. AR 350–6, Training: Army-Wide Small Arm Competitive Marksmanship, 26 February 1974.

ae. AR 350–35, Training: New Equipment Training and Introduction, 1 November 1981.

af. AR 700–20, Logistics: Ammunition Peculiar Equipment (APE), 15 April 1979.

ag. AR 700–22, Logistics: Worldwide Ammunition Reporting System (WARS); RCS (GSGLD–1322) (R1)(MIN), 18 August 1976 (under revision).

ah. AR 700–90, Logistics: Army Industrial Preparedness Program, 15 April 1982.

ai. AR 700–127, Logistics: Integrated Logistic Support, 1 April 1981.

aj. AR 702–6, Product Assurance: Ammunition Stockpile Reliability Program (ASRP), 1 June 1980.

ak. AR 702–9, Product Assurance: Product Testing of Army Materiel, 7 March 1977.

al. AR 710–1, Inventory Management: Centralized Inventory Management of the Army Supply System, 30 December 1970, with changes.

am. AR 710–2, Inventory Management: Materiel Management for Using Units Support Units, and Installations, 1 October 1981.

an. AR 710–8, Inventory Management: Non-nuclear Ammunition Combat Rates, 3 January 1975.

ao. AR 740–1, Storage and Supply Activities: Storage and Supply Activity Operations, 23 April 1971, with changes.

ap. AR 740–26, Storage and Supply Activities: Physical Inventory Control, 1 July 1980.

aq. AR 750–1, Maintenance of Supplies and Equipment: Army Materiel Maintenance Concepts and Policies, 1 April 1978, with changes.

ar. AR 1000–1, Utilization: Basic Policies for Systems Acquisition, 1 May 1980 (under revision).

A–3. Chief of Staff regulations (Apply only to HQDA).

a. CSR 5–13, Management: Ammunition Management, 13 January 1981.

b. CSR 10–20, Organization and Functions: Office of the Deputy Chief of Staff for Operations and Plans (under revision).

c. CSR 10–21, Organization and Functions: Office of the Deputy Chief of Staff for Personnel, 17 August 1978.

d. CSR 10–22, Organization and Functions: Office of the Deputy Chief of Staff for Logistics, 6 November 1979.

e. CSR 10–24, Organization and Functions: Office of the Deputy Chief of Staff for Research, Development, and Acquisition, 18 January 1980.

f. CSR 11–1, Army Programs: The Planning, Programing, and Budgeting System, 25 November 1974.

g. (C) CSR 11–21, Army Programs: Review and Approval of War Reserve Stock, Allies (WRSA) and Contingency Stockpile (SCS) Program (U) 17 January 1979.

A–4. Other publications.

a. (C) SB 38–26, Logistics Management: Non-nuclear Ammunition Supply Rates (U), 20 April 1979.

b. TM 38–750, Logistics Management: The Army Maintenance Management System (TAMMS), 31 May 1981.

c. TM 43–0001–28, Army Ammunition Data Sheets: Artillery Ammunition, 25 April 1977, with changes.

Appendix B
MANAGEMENT INFORMATION SYSTEMS

B–1. Army Ammunition Management Information Systems.

Management Information Systems which support Army ammunition management include the following:

a. Worldwide Ammunition Reporting System (WARS).
b. Conventional Ammunition Readiness Evaluation System (CARES).
c. Standard Army Ammunition System (SAAS).
(1) Theater Applications—level 1.
(2) Below Theater Application—level 3 (not currently operational).
(3) Storage Activity—level 4 (not currently operational).
d. Standard USAREUR Munitions Systems (SUMS).
e. USARJ Standard Ammunition System.
f. Korea Ammunition Management System (KAMS).
g. Installation Worldwide Ammunition Reporting System (IWARS).
h. MACOM Worldwide Ammunition Reporting System (MWARS).
i. Training Ammunition Management Information System (TAMIS).
j. Structure and Composition System (SACS).
k. Production Base Plans and Management Systems.

B–2. Worldwide Ammunition Reporting System (WARS).

Logistics management information system used by ammunition managers throughout the Army at all management echelons. The system consists of the following four subsystem modules:

- Requirements and Assets.
- Maintenance, Renovation, and Demilitarization.
- Serviceability.
- Readiness Assessment.

a. The focus of the system is the Department of Army Ammunition Management Information Data Bank operated by the ARRCOM. That data bank, with one or two exceptions, is the source of the WARS reports. The exceptions are those reports which are executed on a manual basis, such as the Allocation Report and the Toxic Chemical Munitions Report.

b. The WARS Data Bank receives feeder reports from a series of standard systems; these are—

- The DARCOM Commodity Command Standard System.
- The DARCOM Depot Standard System Application (SSA).
- SAAS.
- The FORSCOM/TRADOC Feeder Systems (MWARS).

c. The following are outputs of the modules indicated and their frequency:

(1) *Part 1. Worldwide Ammunition Requirements and Assets Reports.*
(a) Monthly . . . . . M
(b) Quarterly . . . . . Q
(c) Tonnage/Cost Data . . . . . Q
(d) Maintenance & Packaging Materiel . . . . . Q
(e) Toxic Chemical Agents . . . . . S/A
(f) Dummy Drill & Inert . . . . . A
(g) Allocations . . . . . S/A
(h) Training Authorization/Expenditure . . . . . Q
(2) *Part II. Worldwide Ammunition Maintenance Reports.*
(a) Renovation/Packaging & Preservation . . . . . M
(b) Demilitarization/Disposal . . . . . M
(3) *Part III. Worldwide Ammunition Serviceability Report.*
(Inspection and Lot Number)
(a) DODIC, NSN, Lot Number by Location . . . . . Q
(b) DODIC, NSN, Lot Number Consolidated Report . . . . . Q
(c) DODIC, NSN, Lot Number Suspensions/Restrictions . . . . . Q
(d) Analysis of unserviceable assets by condition code, NSN, and Lot Number . . . . . Q

(e) Ammunition Condition and Tonnage Report by DODIC and Location .....Q
(4) *Part IV. Worldwide Ammunition Readiness Assessment Report* .....Q

B–3. Conventional Ammunition Readiness Evaluation System (CARES).

a. The purpose of CARES is to access conventional ammunition readiness by timing increment from M–day to M+180 days in three situations:

(1) 180 days of combat support in Europe.

(2) 180 days of combat support in the Pacific (Korea).

(3) A worst case combination of (1) and (2) above.

b. CARES uses existing data bases including WARS for assets and DESCOM D–Rate Computations (based on AR 11–11) for combat requirements. CARES then performs a readiness assessment for each item of ammunition (by DODAQ based on days of supply to the requirement based on the following criteria (see AR 720–1):

(1) C1 if stock availability to meet requirement is 90 percent or greater.

(2) C2 if 80 percent but less than 90 percent.

(3) C3 if 65 percent but less than 80 percent.

(4) C4 if less than 65 percent. CARES summary data can also be displayed by categories; i.e., small caliber, mortar, tank, artillery, etc., as required.

c. The following are outputs of CARES:

(1) Part I—displays assets by timeframe stratified to a requirement expressed in seven time periods—M–day to M+15, M+15 to M+30, and 30–day increment through M+180.

(2) Part II—Displays by DODAC the days and percent short to 180–day requirement and projected "get well" date.

(3) Readiness condition; i.e., C1, C2, C3, or C4 by DODAC.

B–4. Standard Army Ammunition System (SAAS).

a. Standard prior to 1973. Prior to 1973, the Army did not have a standard automated ammunition management system for use in the field. Operations were basically manual; however, several commands had unique ADP systems for providing class V management information and developing the WARS report for ARRCOM.

b. 1971—DA published CSM 71–202. On 1 June 1971, DA published CSM 71–202, which governed Standard Army Intermediate Level Supply (SAILS) development. The SAILS concept originally included ammunition. Subsequent to the CSM, the class V portion was withdrawn from SAILS and established as a separate element of the Standard Army Logistics System (SALS). This new system was entitled SAAS. A DA tasking letter formalizing this action was published on 11 January 1972. As a result of a DA decision to accelerate the SAAS development effort as well as to field an operational system in USAREUR as soon as possible, a detailed analysis of current ongoing systems was undertaken. The result of this analysis was the selection of the US Army Pacific (USARPAC) Central Munitions System to serve as the theater system baseline. In addition, WARS was selected as the baseline reporting system for SAAS between the major command (level 1) and the national level.

c. 1973—SAAS designated as level 1 system. In June 1973, the converted USARPAC Central Munitions System was tested by the 60th Ordnance Group, USAREUR. This system was accepted by USAREUR in July 1973, renamed SAAS, and designated as the level 1 (theater) system. At the same time, the USARPAC Central Munitions System operated by USARPAC at Fort Shafter, Hawaii, was replaced by the SAAS level 1 system.

d. Theater Application—level 1.

(1) *Level 1.* The Theater Materiel Management Center (MMC) is an activity which performs centralized theater inventory management, maintains visibility of all theater assets, and acts as the theater's interface with the DARCOM wholesale level. It performs the mission and functions of supply management, maintenance, serviceability, transportation, intransit control, and SAAS/NICP interface management. It also provides the required logistical/tactical interface management. Ammunition assets are divided into five general categories—

(a) Prepositioned War Reserve Materiel Stocks (PWRMS). These are part of the theater's war reserve and represent stockage levels of mission-essential items to support post D-day combat consumption until resupply from CONUS facilities can be accomplished.

(b) Operational project stocks. These are part of the theater's war reserve and represent operational project stocks approved in accordance with AR 710–1. These projects provide authorization for the major commander to acquire materiel in support of specific operations, contingencies, and/or plans for specific geographical areas.

(c) Basic loads. Basic load is that quantity of nonnuclear ammunition the theater commander (FORSCOM Commander for Strategic Army Forces (STRAF) Units) authorizes for wartime purposes and requires to be designated for and carried into combat by a unit. The basic load provides the unit sufficient ammunition to sustain itself in combat until the unit can be resupplied. The basic load is managed by the unit and includes, but is not necessarily limited to, ammunition carried by the individual soldier, stored in crew vehicles, carried on prime movers and in the unit trains. It is expressed in rounds, units of weight for each type ammunition for each type weapon, and in other units of measure

for bulk allotment items. Basic loads do not include items authorized by Tables of Organization and Equipment (TOE)/ Tables of Distribution and Allowances (TDA) (e.g., explosive components of sets or kits).

(d) Training/operational stocks. These stocks include ammunition required to support training requirements and other operational requirements which do not fall within the other requirement categories.

(e) Combat operations support levels. These are stock levels required for combat areas upon initial entry into conflict. The PPWR stocks become a part of these levels and are applied against the stockage objective.

(2) *Operational Status.* SAAS level 1 is operational at Fort Shafter, Hawaii. The Central Ammunition Management Office-Pacific (CAMO–PAC) performs theater level management for the US Army in the Pacific Theater. SAAS level 1 is also operational in Zweibruecken, Germany, where the 200th Theater Army MMC performs theater ammunition management for USAREUR.

e. Below Theater Application—level 3.

(1) *Level 3.* The stock control activity is an activity which exercises stock control over the assets of one or more storage activities. It is also the highest level at which formal accountability may be maintained in an automated environment. It is basically the management level which controls the operations of all its subordinate levels and provides the interface with level 1. It accomplishes supply, maintenance, serviceability, transportation, storage, in-transit control, and SAAS interface management. It also provides the required logistical/tactical interface management.

(2) *Goal.* The SAAS level 3 system will be designed to provide improved operational capabilities for the level 3 activity while minimizing manual workload. This will be accomplished by improved information processing on third generation automatic data processing equipment (ADPE) and an automated interface with other standard systems as the Army Master Data File (AMDF), Asset Control System (ACS), and Department of the Army Management Movement System (DAMMS). SAAS level 3 will provide an improved management system by performing the following functions:

(a) Processing MILSTRIP, MILSTAMP, and excess documents. Military Standard Requisitioning and Issue Procedures (MILSTRIP), Military Standard Transportation and Movement Procedures (MILSTAMP), excess and related SAAS documents will be maintained on a history file.

(b) Maintain stock status. The SAAS level 3 system will maintain stock status by only the DOD identification code (DODIC) or by a combination of DODIC, national stock number (NSN), and lot number. Flexibility will be included in the level 3 system which will enable one storage site to report stock status by DODIC while another site reports by transactions containing DODIC, NSN, and lot number. If NSN and lot number information is maintained, parallel DODIC summary information will be automatically produced for stock status reporting to SAAS level 1. Records will be maintained by account code and condition, showing quantity on hand, quantity due in, and quantity due out for each storage site.

(c) Reconciliation process. SAAS level 1 will periodically reconcile its stock balances with those stock balances at level 3. This reconciliation will be by DODIC, account, condition code, and quantity on hand. A reconciliation card is currently produced by the SAAS level 1 system. The SAAS level 3 system will be designed to accept this reconciliation card from level 1, detect any imbalances, and produce an exception report on imbalances for the level 3 manager. Adjustments necessary to correct any imbalances will be submitted by the level 3 manager during periodic stock status reporting.

(d) Maintain accountable stock records. The level 3 activity will use the detailed reporting capability described above when maintaining accountable records. Accountability may be maintained by a general support (GS) activity or any activity with centralized accountability for a number of remote storage sites. Daily or periodic (as required) receipt, issue, and adjustment transactions by DODIC, national item identification number (NHN), and lot number will be submitted to the level 3 activity by storage sites to update accountable stock balances. These transactions will be in MILSTRIP format to the maximum extent possible. All documents which update the accountable balances will be recorded on a historical file to maintain an audit trail. When accountability has been centralized at the level 3 activity, the SAAS level 3 system will produce inventory requests, Inventory/Location Survey Cards (DA Form 2000), and inventory and location survey worksheets as required by AR 710–2 and AR 740–26. In addition, the many reports required to support accountability will be produced for the level 3 manager. These reports include voucher registers, daily transaction reports, and other similar reports.

(e) Maintain serviceability information. Maintain serviceability information that will enable the level 3 activity to segregate stocks based on suspension notices and to provide lot number information for the WARS report and other management functions. Serviceability information will be maintained by DODIC, lot number, NSN, type storage code, year of manufacture, defect codes, component lot numbers, quantity on hand, and by condition codes.

(f) Guided missiles and large rockets (GMLR) asset data. The SAAS level 3 system will be designed to provide the level 3 manager with the detailed information he needs to manage GMLR items. For a complete asset picture of all items in the Level 3 area of responsibility, the SAAS level 3 system will record GMLR assets on hand at the DSU/ GSU or held by individual units. GMLR items will be recorded by unit identification code (UIC) and serial number in all circumstances. Summary information by DODIC is also maintained to facilitate conversion from peacetime to wartime environments.

(g) Compute authorized levels. The level 3 system will compute authorized levels by storage site, DODIC, and

account. The level 3 manager will have the option of designating by storage site and account the method by which the authorized level is computed.

(h) Asset stratification. The SAAS level 3 system will have the ability to stratify assets against authorized levels by account code. The level 3 manager will establish stratification parameters on the Requirements Data File and will be provided a report showing the results of the stratification (report similar to PCN–AJB–230 in the SAAS level 1 system).

(3) *Special requirements for an independent force.* Because an independent force must have the ability to rapidly deploy to remote areas, the capability will be included in the SAAS level 3 system to allow the independent forces to bypass the normal interface with a SAAS level 1 activity and interface direct with CONUS wholesale support activities.

f. Storage Activity—level 4. The storage activity is one whose principal mission is to exercise custody of stocks for distribution to the user Direct Support Unit (DSU role) or to other storage activities General Support Unit (GSU role). This is an operational level and accomplishes supply, maintenance, serviceability, transportation, and storage operations. It operates in a manual environment but may provide interface input to level 3 in a punch card format.

B–4. Standard USAREUR Munitions Systems (SUMS).

a. Background. To accommodate the installation of the SAAS level 1 system in USAREUR, the Miesau Army Depot lot locator system was renamed as the SUMS and expanded to provide a reporting capability to SAAS level 1. SUMS operates in two modes, the "depot mode" and the "visibility mode." The "depot mode" accommodates those processes necessary for managing and controlling the day-to-day operations of an accountable supply distribution activity (ASDA) such as Miesau Army Depot. (Class V accountability in USAREUR is decentralized.) This service is provided also for the 84th Ordnance Battalion in support of its management of approximately thirty (30) prestock points stocking war reserves and units basic loads. SUMS serves all other USAREUR munitions activities in the nonaccountable "visibility mode."

b. Operation. The SUMS system is based on a unit record for each ammunition lot/serial number by NSN and DODIC in a specific condition code at a location. Various reports are produced from the SUMS data base to show the status of all ammunition items in the theater. Other normal management reports such as voucher registers and edit/error lists are also produced.

B–5. USARJ Standard Ammunition Management System.

a. Background. This system is operated by HQ USARJ, Camp Zama, Japan, and provides basic stock accounting and supply management support for US-owned class V assets in Okinawa and Japan. Since this system is used to maintain accountability for US assets in Okinawa and Japan, stock status information is recorded by DODIC, NSN, and lot number. To support accountability functions, the USARJ system produces and accepts inventory and location survey transactions. To support surveillance requirements, the USARJ system generates Q1/Q2 documents in SAAS level 1 format.

b. Operation. Various management reports are produced by the system for the ammunition manager. These reports include edit/error lists, transaction registers, inventory and location survey reports, and output card listings. In addition, a monthly stock status report is produced showing the status of on-hand assets by DODIC, NSN, lot number, condition, and warehouse location. DODIC summaries are also provided on the report which reflect tonnage and dollar-value statistics by condition code.

B–6. Korea Ammunition Management System (KAMS).

This system maintains the stock control for all US-owned class V items in Korea and is also used to maintain visibility of the Republic of Korea Army (ROKA) class V assets. Since accountability for US-owned assets in Korea has been decentralized to the storage activity, the system developed by the 19th Support Command is strictly DODIC-oriented. Lot number and NSN information required for surveillance and to be reported to SAAS level 1 is reported by a separate manual reporting system. Because the system is DODIC-oriented, a simple reporting procedure was developed containing six data fields using 24 card columns of information. Backup documentation is submitted by the storage site by mail or courier for each transaction posted to the system.

B–7. Installation and MACOM Worldwide Ammunition Reporting System.

HQ FORSCOM/TRADOC MWARS consolidates and reformats respective installation input (IWARS) for submission to ARRCOM. FORSCOM MWARS output also includes National Guard asset data. Both National Guard and Army Reserve requirements data are included in the FORSCOM/TRADOC MWARS output. MWARS/IWARS identify training, basic load and operational project assets and requirements. The condition, quantity, and location of ammunition can be monitored by the MWARS. Ammunition requirements for training are forecasted for a 12-month period for planning to facilitate distribution of items in short supply. MACOMs use this information to redistribute assets between reporting activities to meet training/test requirements. Alaska and Panama report WARS data directly to ARRCOM;

however, their reports include weapons density and War Reserve data and are, therefore, classified. The Alaska and Panama WARS Reports to ARRCOM include maintenance, packaging materiel, lot number, and age data.

B–8. Training Ammunition Management Information System (TAMIS).

a. Background. The TAMIS is a management system which provides ammunition usage information on which the commander can base his decisions. The system provides the commander with the opportunity to influence the development of his ammunition authorization so that it complements the training of his command, allows flexibility in adjusting authorizations to fit changing circumstances or environments, and permits him to have complete control over authorizations to his subordinate elements. Under this system, the commander has incentives and the flexibility to conserve or use less expensive ammunition in meeting his training goals.

b. Training Ammunition Authorization Committee. The TAAC, composed of senior Army representatives from the Army Staff and major commands, meets annually to review authorized training ammunition resources, requirements, and management and authorize training ammunition resources to MACOM and NGB for the next fiscal year. MACOMs and ARNG will subauthorize resources to elements of their commands and the ARNG.

c. Operation. Units will report expenditures of ammunition in training throughout the training year. Because the system has the facility to constantly audit a commander's use of resources through maintaining a status of credits and debits, this data (maintained within the TAMIS data base) will be the foundation for the commander to adjust the ammunition authorized for his command provided: the total dollar value of the authorization is not exceeded; the change is supportable by the stockpile; and is not prohibited or restricted by command or ARNG policy.

B–9. Structure and Composition System (SACS).

a. SACS is a network of computerized data bases which display quantitative and qualitative manpower and equipment requirements and authorizations for a selected force over time.

b. ODCSOPS is the proponent of the LOGSACS system. There are four primary component data bases which contribute to the SACS computation. They are—

(1) The Force Accounting System.

(2) The Table of Organization and Equipment File.

(3) The Army Authorization Documents System.

(4) The Basis of Issue Plans.

c. The force accounting system contains the DA Master Force (M–Force) Program. The M–Force is a troop list of the current and projected force structure. It provides the following data:

(1) Unit designation; i.e., 1/503 Abn Infantry Bn.

(2) Type of unit by mission; i.e., Armor, Infantry.

(3) Geographic location and command assignment.

(4) When the unit will be activated, inactivated, or recognized.

(5) How the unit is organized, based on the appropriate authorization documents.

d. The M–Force is maintained on computer tape in order to manage forces today and to plan future actions. It contains information on the current or real world force that should exist in the current fiscal year. This force is updated periodically to reflect changes in geographical location, changes in command assignment, activations, and deactivations. It also depicts how the Army should look at the close of the budget year and its configuration carried through the POM period. It reflects the program decisions rendered by OSD by the Presidential Budget and is amended to show changes resulting from apportionment decisions. In effect, it then becomes the apportionment force.

e. The force accounting system also contains an unconstrained force which serves as Army input to the Joint Strategic Planning Document (JSPD).

f. The table of organization (TOE) file consists of prototype organizational structures displaying minimum essential personnel and equipment required for prescribed missions of each type of unit in the Army. TRADOC is the Army proponent for development of TOEs. TOEs are approved by ODCSOPS (DAMO–RQ). A magnetic tape file is maintained of all approved TOEs plus those being processed for approval. The TOE is a prototype document used primarily for study purposes. It is no longer the basis for authority for requisition of personnel and equipment by unit commanders in the field.

g. The Army Authorization Documents System (TAADS) provides the unit in the field with the tailored structure it needs to perform its mission. TAADS is sensitive to peculiar requirements of the operational environment and secondary mission tasks. It serves as the authority for requisitions from the field for personnel and equipment. TAADS is divided into two subsystems—

(1) *The modification table of organization and equipment (MTOE).* The MTOE reflects tailored personnel and equipment modifications, to include modernization items not present in the Army inventory when the prototype TOE was developed or substitute items because of asset shortages and distribution priorities.

(2) *The tables of distribution and allowances (TDA).* A file of tables of distribution and allowance documents for all augmentation, training, and post support activities. The field commander is proponent to these documents, but the

details are transcribed into the data base. The Department of the Army Staff compiles authorizations and passes them down the chain to the parent unit commander through the Vertical TAADS (VTAADS).

h. The final major SACS component is the Basis of Issue Plan (BOIP). The BOIP consists of unit requirements for new equipment items to enter the Army inventory, but not yet reflected in the TOE. TRADOC is the proponent for BOIP. When an item of equipment is known to be available for distribution within some given timeframe, but the item is not included in any TOE and MTOE, the item may be added to the file as the file "add-on" based on the BOIP. Thus, the new item could be added to specific units in accordance with planning priorities. Ultimately, the new item is added to new TOEs, dropped from the BOIP, and included directly in revised MTOEs.

i. The SACS itself is constructed from these several data sources. First, the appropriate force is selected from the Force Accounting System. This force is updated and edited to reflect prescribed constraints based on current program guidance. The updated version of the force becomes the basis for the SACS computation.

j. The TAADS tape is now overlaid on the SACS tape. The computer can be selectively instructed to omit a TAADS document for a unit projected for reorganization and to select from the TOE file the proper TOE unit document.

k. Once units have been matched with their appropriate organizational documents, the equipment add-ons from the BOIP tape are introduced to the SACS tape. When completed, the SACS tape now contains the information to display how many personnel and how much equipment will be required to man and outfit the force being studied.

l. The final step is to aggregate the requirements into the format required. Output may be magnetic tape or hard copy prints. Outputs are usually aggregated to identify—

(1) Personnel requirements/authorizations.

(2) Procurement of Ammunition, Army (PAA) requirements for ODCSRDA budget computation purposes.

(3) Distribution requirements/authorizations for ODCSLOG and DARCOM.

m. The distribution LOGSACS is further modified by joint action of ODCSLOG, ODCSOPS, and DESCOM to limit equipment or weapons availability to that known to be available for distribution within the applicable timeframe. The "real world" constraint is not applied to the LOGSACS tape used for PAA requirements; i.e., AAO computation.

B–10. Production Base Plans and Management Systems.

a. The Production Base Plan (PBP)/Production Base Analysis (PBA). The PBP/PBA is a consolidated document which serves two basic functions:

(1) The PBA is the basis of information which provides necessary justification and direction for structuring the ammunition modernization/expansion program to support mobilization in conjunction with the five-year procurement program.

(2) The PBP reflects the results of mobilization planning to satisfy mobilization requirements on an M–Day assumed to be the first day of the budget year. The PBP reflects capability shortfalls in the existing base to meet *near-term* requirements. It also provides justification for the retention, layaway, and maintenance of the reserve production base in accordance with Defense Guidance.

b. Munitions Production Base Modernization and Expansion (M&E) Plan. The M&E Plan is maintained and periodically updated as the means for documenting and controlling the total M&E effort at the project level for all Government and commercial facilities needed to support production requirements.

c. Plant Equipment Package Management Information System (PEPMIS). The PEPMIS is a centrally managed data base for all industrial plant equipment, other plant equipment, special tooling and special test equipment required to be retained in order to meet the mobilization schedule specified in the PBP. Carefully selected data elements that are required to enable Plant Equipment Package (PEP) Managers to make necessary decisions concerning each PEP are included. The data base enables the PEP Manager to—

(1) Optimally allocate the production base equipment and special tooling.

(2) Identify equipment candidates for acquisition, rehabilitation, or replacement.

(3) Assess the impact that mobilization requirement changes have on equipment assets.

(4) Assess the capability of the plant equipment package to achieve the mobilization requirement.

d. Production Base Maintenance and Layaway Data Base. The Production Base Maintenance and Layaway Data Base consists of an automated reference file of all laidaway production lines and facilities located within the industrial base and a system of networks which identify the steps necessary to reactivate a production line or support facility. The historical file establishes a complete accessible catalog of laidaway facilities. It identifies readiness status, maintenance history, response ability, and condition status. The reactivation networks identify high risk elements, constraints, and potential trouble spots. The system will portray whether a laidaway facility can produce a product in the timeframe and quantity necessary to fill mobilization demands. This technique can also be adopted to active line acceleration and surge production.

Appendix C
SUMMARY OF GOVERNMENT PRODUCTION BASE FACILITIES

C–1. Under construction.

MISSISSIPPI ARMY AMMUNITION PLANT

INSTALLATION: Mississippi AAP, Bay St. Louis, Mississippi.

OPERATOR: GOCO—Mason-Chamberlain Inc.

MISSION/CAPABILITY: Integrated production of M483A1 155mm ICM projectile. This includes manufacture of the projectile metal parts, manufacture of the cargo metal parts and load, assembly, and pack. Using the most modem advances in manufacturing methods and technology, the plant will be capable of producing 120,000 rounds per month.

INVESTMENT, SIZE, PERSONNEL, & MODERNIZATION: Three main complexes are planned for production—

a. Projectile metal parts area with over 13 acres of roof area.

b. Cargo metal parts area with approximately 6 acres of roof area.

c. The load, assemble, and pack area with over 10 acres of roof area. An additional 5 acres of roof area will house support and administrative operations. The plant is on federally owned property comprising some 13,480 acres. Projected employment on a 1–8–5 basis will be 2,000 and approximately 5,500 at maximum production. Current personnel strength is 16 Government and 195 contractor.

HISTORY: The Mississippi AAP is the first ammunition plant to be built by the Army in more than 25 years. Although in the design stage for several years, ground was broken on 8 January 1978 on the northern portion of the NASA National Space Technology Laboratories facility. Constructing and equipping of this new facility will take place through 1982 under the management of the ARRCOM Munitions Production Base Modernization Agency. From FY76 to FY82 over $440 million of modernized/expanded facilities have been constructed or are in progress.

C–2. Active facilities.

a. CRANE ARMY AMMUNITION ACTIVITY

INSTALLATION: Crane AAA, Crane, Indiana.

OPERATOR: GOGO—ARRCOM (formerly Navy).

MISSION/CAPABILITY: Load, assemble, and pack of Navy gun ammunition, Cluster Bomb Units (CBUs) (Rockeye), bombs, warheads, fuzes, propelling charges, pyrotechnics, and initiating items.

INVESTMENT, SIZE, PERSONNEL & MODERNIZATION: Estimated replacement value is approximately $500 million. There are 7.4 million square feet of SMCA facilities with approximately 11 percent devoted to industrial production with the balance to storage. There are a total of 52,000 acres of land under SMCA control. Current personnel strength is 868 Government.

HISTORY: Commissioned in December 1941, its mission was to prepare, load, renovate, receive, store, and issue all types of naval ammunition. Crane has constantly broadened its mission through the post WWII years involving itself in more complex weapons and equipment and acquiring a Weapons Quality Engineering Center and a Fleet Logistics Support Center. In 1977 ammunition production and storage facilities and related personnel were placed under the SMCA. About 2,750 personnel and 11,000 acres are still under Navy control. Facility modernization from SMCA transfer until the end of FY82 amounts to $1.9 million.

b. HAWTHORNE ARMY AMMUNITION PLANT

INSTALLATION: Hawthorne AAP, Hawthorne, Nevada.

OPERATOR: GOCO—Day, Zimmerman, and Basil, Inc. (Formerly Navy GOGO)

MISSION/CAPABILITY: Load, assemble, and pack bombs, warhead, rockets, propelling charges, CBUs, fuel air explosive (FAE), Navy gun ammunition and related fuzes, primers, and detonators.

INVESTMENT, SIZE, PERSONNEL & MODERNIZATION: Replacement value is estimated at $456 million. There are 8.3 million square feet of covered facilities with 4 percent devoted to industrial production and the balance to

storage. There are approximately 235 square miles of property. Current personnel strength is 71 Government and 571 contractor. Mobilization employment is projected at 1,900 personnel.

HISTORY: As a result of the catastrophic 1926 explosion at Lake Denmark, NJ (now part of Picatinny Arsenal), a Court of Inquiry recommended the establishment of a centrally located strategic naval ammunition depot to serve the Pacific. Groundbreaking took place July 1928 and commissioning September 1930. From 1930 to 1939 the primary function was storage. Operations were expanded to include production of various types of ammunition such as rockets, mines, depth charges, bombs, and torpedoes. It had operated continuously as a depot since commissioning until transfer to the SMCA. Facility modernization from SMCA transfer until the end of FY82 amounts to $3.9 million.

c. HOLSTON ARMY AMMUNITION PLANT

INSTALLATION: Holston AAP, Kingsport, Tennessee.

OPERATOR: GOCO-Holston Defense Corporation (Subsidiary of Eastman Kodak Company).

MISSION/CAPABILITY: Manufactures explosives including Compositions A, B, C, RDX-HMX, Composition A–3 and B–3, and many other special explosive products for all Services, Department of Energy, and NASA applications. Present monthly production of all materials is 1,200,000 pounds, with Composition B amounting to 800,000 pounds. Peak production of 326,000,000 pounds was achieved in 1968.

INVESTMENT, SIZE, PERSONNEL & MODERNIZATION: Estimated replacement value is $1,038 million. There are 2,465,000 square feet of floor space with approximately 60 percent devoted to manufacturing. Current personnel strength is 35 Government and 1,021 contractor. Estimated mobilization personnel requirements are 1,200.

HISTORY: Construction was initiated 1 July 1042 and completed 15 March 1944. During WWII 6,854 contractor and 500 Government personnel produced millions of pounds of Composition B. The plant was in standby status from 1 May 1946 to 1 April 1949. It has been active since 1 April 1949 and has expanded to meet requirements of both the Korean and Vietnam eras. Peak Vietnam employment was 3,613 contractor and 52 Government personnel. From FY70 to FY82, over $31 million of modernized/expanded facilities have been constructed or committed.

d. INDIANA ARMY AMMUNITION PLANT

INSTALLATION: Indiana AAP, Charlestown, Indiana.

OPERATOR: GOCO—ICI Americas, Inc.

MISSION/CAPABILITY: Loads, assembles, and packs propellant charges; manufactures single-base propellant and propellant charge bags and liners. Constitutes the only US capability for the manufacture of black powder.

INVESTMENT, SIZE, PERSONNEL & MODERNIZATION. Estimated replacement is $1,338 million. There are over 4.5 million square feet of facilities with about half devoted to production and about a third to supply. There are 10,649 acres of land. Current personnel strength is 42 Government and 1,611 contractor. Estimated mobilization personnel requirements are 20,300.

HISTORY: Construction was initiated for smokeless powder in August 1940 and completed May 1942. These facilities employed 27,154 at peak WWII production and exceeded the total WWI output of all US plants. After reactivation of Korea requirements, major layaway was again initiated in 1954. Facilities for manufacture and loading of bags were started January 1941 and completed February 1942. This was the first of four US bag-loading facilities built in WWII. Production was terminated August 1945. Manufacturing operations were reestablished in the 1952 and 1957 timeframe and then continuously from December 1961. Peak Korean and Vietnam bag-loading and manufacturing employment was 8,067 and 19,000, respectively. From FY70 to FY82 over $103 million of modernized/expanded facilities have been constructed or are in-process.

e. IOWA ARMY AMMUNITION PLANT

INSTALLATION: Iowa AAP, Middletown, Iowa.

OPERATOR: GOCO—Mason & Hanger—Silas Mason Co., Inc.

MISSION/CAPABILITY: Loads, assembles, and packs 90mm through 8–in projectiles, including components such

as primers, detonators, fuzes, and boosters; mortar rounds—81mm and larger including their explosive components; antitank and antipersonnel mines; warheads (TOW and DRAGON) and demolition charges.

INVESTMENT, SIZE, PERSONNEL & MODERNIZATION: Estimated replacement value is $915 million. There are facilities totaling over 4.2 million square feet about equally divided between production and supply. There are a total of 19,257 acres of land. Current personnel strength is 958 contractor and 50 Government. Estimated mobilization personnel requirements are 7,200.

HISTORY: Construction was initiated in January 1941 and completed February 1942. WWII production was suspended 14 August 1945, and on 6 January 1946 the plant was converted to a GOCO status with a standby Government employment of 227 employees. From June 1946 to January 1950 fertilizer was produced by a Government contractor using the nitrate area. Production was resumed 1 August 1949 and by January 1951 Government employment reached 1,245. In March 1951 Silas Mason Co. assumed full operational responsibility. Southeast Asia created a requirement for major acceleration of activity; however, starting in FY74 layaway of several major lines was initiated. From FY70 to FY82 over $58 million of modernized/expanded facilities have been constructed or are in-process.

f. KANSAS ARMY AMMUNITION PLANT

INSTALLATION: Kansas AAP, Parsons, Kansas.

OPERATOR: GOCO—Day and Zimmerman, Inc.

MISSION/CAPABILITY: Loads, assembles, and packs 81mm mortars, 155mm Improved Conventional Munitions, 105mm howitzer projectiles, and CBU and related primers and detonators. A modem inactive lead azide facility also exists.

INVESTMENT, SIZE, PERSONNEL & MODERNIZATION: Estimated replacement value is $326 million. There are facilities totaling over 2.2 million square feet about equally divided between production and supply uses. There are a total of 13,727 acres of land. Current personnel strength is 717 contractor and 28 Government. Estimated mobilization personnel requirements are 4,600.

HISTORY: Construction was initiated August 1941 and completed November 1942. WWII peak employment was over 7,600 personnel. Production was terminated August 1945, and KAAP remained in standby until reactivation for Korea from August 1950 to the mid–50's. Peak Korean employment was just over 6,000. The plant was in standby status again from 1957 to 1967. Production to support Southeast Asia was initiated starting September 1967. Starting in 1971 some fuze, primer, and CBU lines were placed in standby. From FY70 to FY82, $19 million of modernized facilities have been constructed or are in-process.

g. LAKE CITY ARMY AMMUNITION PLANT

INSTALLATION: Lake City AAP, Independence, Missouri.

OPERATOR: GOCO—Remington Arms Company.

MISSION/CAPABILITY: Metal parts production and load. assemble, and pack of small caliber ammunition; i.e., 5.56mm, 7.62mm, 20mm, 30mm, as well as .30 and .50 caliber. This AAP produces about 93 percent of present Army small arms requirements. A new Small Caliber Ammunition Modernization Program facility for 5.6mm ammo production is the world's most modern and automated high speed, small caliber ammunition production facility.

INVESTMENT, SIZE, PERSONNEL & MODERNIZATION. Replacement value is $518 million. There are facilities totaling nearly 3.2 million square feet with about two-thirds devoted to production and one-third to supply. There are 3,909 acres of land. Current personnel strength is 66 Government and 1,768 contractor. Estimated mobilization personnel requirements are 10,900.

HISTORY: Construction was initiated in December 1940. The first building was completed October 1941. WWII peak employment was 21,229 personnel. On 28 August 1945, manufacturing was terminated. The plant was maintained in standby status until December 1950 with equipment laid away in position. This proved beneficial in meeting Korean requirements earlier than planned. It has remained active and has taken on small arms industrial engineering, surveillance, test, and technology missions. Since reactivation in 1950 over 25 billion rounds of accepted ammunition have been produced. From FY70 to FY82, over $103 million of modernized/expanded facilities have been constructed or are

in-process.

h. LONE STAR ARMY AMMUNITION PLANT

INSTALLATION: Lone Star AAP, Texarkana, Texas.

OPERATOR: GOCO—Day and Zimmerman, Inc.

MISSION/CAPABILITY: Loads, assembles, and packs a variety of items including 60mm and 81mm mortars, hand grenades, 105mrn howitzer, 155mm and 8–inch artillery rounds, rockets, and related fuzes, boosters, delays, primers, bursters, and detonators. Of the 13 major lines, six are in operation producing approximately 25 items, with the other in standby.

INVESTMENT, SIZE, PERSONNEL & MODERNIZATION: Estimated replacement value is $483 million. There are facilities totaling over 3 million square feet divided roughly between supply and production. There are 15,546 acres of land. Current personnel strength is 1,382 contractor and 69 Government. Estimated mobilization personnel requirements are 11,000.

HISTORY: Construction was initiated mid–1941 and completed the summer of 1942. Twelve production lines were in operation during WWII until completion of hostilities. From early 1946, as part of Red River Arsenal, work remained at a low level with many lines inactive, until the start of Korean hostilities. A total of ten lines was placed in production for support of Korea; after Korea production was again curtailed. Starting in 1961, and continuing for the duration of Southeast Asia hostilities, requirements dictated production increases to the point where all 13 lines were active. In December 1969 employment reached a peak of 11,463 personnel. From FY70 to FY82 over $93 million of modernized/expanded facilities have been constructed or are in-process.

i. LONGHORN ARMY AMMUNITION PLANT

INSTALLATION: Longhorn AAP, Marshall, Texas.

OPERATOR: GOCO—Thiokol Corporation.

MISSION/CAPABILITY: Load, assemble, and pack of illumination ammunition for artillery and mortars, pyrotechnics, grenade and ground signals, and rocket motors. Manufactures composite propellants for rockets and missiles.

INVESTMENT, SIZE, PERSONNEL & MODERNIZATION: Estimated replacement value was $207 million. There are facilities totaling over 1.35 million square feet with about one-third devoted to production and one-third to supply. There are 8,492 acres of land. Current personnel strength is 66 Government and 1,307 contractor. Mobilization personnel requirements are estimated at 2,500.

HISTORY: Construction started in 1942. Longhorn was primarily a producer of TNT during WWII having produced a war total of 393,000,000 pounds with a peak employment of 1,518 persons. Between 1945 and 1952, the installation was in standby status. From 1952 to 1956, rehabilitated facilities were used to load, assemble, and pack pyrotechnic ammunition with a peak of 530 employees. Facilities were placed in standby from 1956 to April 1963. In 1955 Thiokol Chemical Corporation began a pilot line operation for solid rocket motor propellants. Operations on pyrotechnic ammunition resumed in April 1963. From FY70 to FY82, over $13 million of modernized/expanded facilities have been constructed or are in-process.

j. LOUISIANA ARMY AMMUNITION PLANT

INSTALLATION: Louisiana AAP, Shreveport, Louisiana.

OPERATOR: GOCO—Thiokol Corporation.

MISSION/CAPABILITY: Loads, assembles, and packs 155mm projectiles, demolition charges, mines, rockets, and rocket warheads and related boosters, fuzes, and detonators. There is also a 155mm metal parts manufacturing facility.

INVESTMENT, SIZE, PERSONNEL & MODERNIZATION. The replacement value is $605 million. There are 2.8 million square feet of facilities, about 50 percent being for production and maintenance. There are 14,974 acres of land. Current employment is 32 Government and 863 contractor. Estimated mobilization personnel requirements are 4,100.

HISTORY: Construction was initiated in 1941. By May 1942 eight load lines were completed and operating. The plant was placed in standby status from 1945 to 1951. In 1958 a metal parts capability was established for the 155mm. After involvement with Korea requirements, the plant was again placed in standby from 1958 to September 1961. In September 1961 production was initiated to support Southeast Asia in traditional roles as well as for 155mm improved conventional munitions. From FY70 to FY82, over $81 million of modernized/expanded facilities have been constructed or are in-process.

k. McALESTER ARMY AMMUNITION PLANT

INSTALLATION: McALESTER AAP, McAlester, Oklahoma.

OPERATOR: GOGO—ARRCOM (formerly Navy).

MISSION/CAPABILITY: Load, assemble, and pack of 20 through 40mm, Navy Gun Ammunition, bombs, APAM (antipersonnel and materiel) CBU 59, rockets (including 2.75 inch), and propelling charges.

INVESTMENT, SIZE, PERSONNEL & MODERNIZATION: Replacement value is estimated at $530 million. There are more than 8 million square feet of covered facilities with 11% devoted to industrial production and the balance to storage facilities. There are 44,960 acres of land. Current personnel strength is 43 Government and 680 contractor. Mobilization employment is projected at 3,800.

HISTORY: Formerly (until 1977) an inland Naval Ammunition Depot providing backup to tidewater facilities, McAlester was commissioned May 1943 and completed December 1943. Additional buildings for producing and storing 20mm to 40mm medium and major caliber ammunition were constructed in 1946. McAlester had operated continuously as depot from commissioning until transfer to SMCA.

l. MILAN ARMY AMMUNITION PLANT

INSTALLATION: Milan AAP, Milan, Tennessee.

OPERATOR: GOCO—Martin Marietta Aluminum Sales, Inc.

MISSION/CAPABILITY: Loads, assembles, and packs 40mm grenades, 60 and 81mm mortars, 106mm recoilless and 105mm tank projectiles, cluster bomb units, mines, and related fuzes, primers, delay plungers, and boosters. A shell metal parts capability also exists.

INVESTMENT, SIZE, PERSONNEL & MODERNIZATION: Estimated replacement value is $535 million. There is a total of 3.7 million square feet of facilities with more than two-thirds devoted to supply and one-quarter to production. There are 22,543 acres of land. Current personnel strength is 804 Government. Estimated mobilization personnel requirements are 9,300.

HISTORY: Construction began January 1941 and was completed in January 1942. There were initially two separate plants, Wolf Creek Ordnance Plant and Milan Ordnance Depot. During WWII, peak employment reached 11,000; during Korea—8,000; during Vietnam—7,000. Milan Arsenal was created on 30 October 1945 and facilities were used primarily for receipt, storage, and processing of returned ammunition. In October 1957 the arsenal was placed in an inactive status. This lasted until January 1960. Milan Ordnance Plant was created from the industrial part of the Arsenal in November 1961. Since Vietnam, several lines were placed in layaway status. From FY70 to FY82, over $53 million in modernized/expanded facilities have been constructed or are in-process.

m. PINE BLUFF ARSENAL

INSTALLATION: Pine Bluff Arsenal, Pine Bluff , Arkansas.

OPERATOR: GOGO—ARRCOM

MISSION/CAPABILITY: Loads, assembles, and packs white phosphorus and smoke medium and major caliber artillery rounds, grenades, and rockets. Produces white phosphorus and smoke filler material. Fabricates chemical defensive material. Has chemical ammunition mission.

INVESTMENT, SIZE, PERSONNEL & MODERNIZATION. Estimated replacement value, including chemical facilities, is $634 million. Current personnel strength is 977 with 5,800 estimated under mobilization conditions. From

FY70 to FY82, over $30 million in modernization/expanded facilities have been constructed or are in-progress.

n. RADFORD ARMY AMMUNITION PLANT

INSTALLATION: Radford AAP, Radford, Virginia.

OPERATOR: GOCO—Hercules Inc.

MISSION/CAPABILITY: Manufactures single- double-, and triple-base propellants, rocket grains, and TNT.

INVESTMENT, SIZE, PERSONNEL & MODERNIZATION: Estimated replacement value is $702 million. There are over 3.4 million square feet of facilities with about 50 percent devoted to manufacture and production. There are 6, 995 acres of land. Current personnel strength is 62 Government and 3,130 contractor. Mobilization employment is estimated at 9,100.

HISTORY: Construction began in September 1940, and production was initiated April 1941. During WWII it produced 500,000 pounds of smokeless powder and 1,000,000 pounds of pentalite per day. The plant was placed in a standby status at the end of WWII. In 1949 limited scale operations were resumed, and major rehabilitation of facilities took place including establishing missile propellant facilities. Because of high Southeast Asia requirements, employment peaked at 9,100 personnel in February 1969. Major modernization was begun in FY70 and approximately $254 million worth of facilities have been built or are in-process.

o. RIVERBANK ARMY AMMUNITION PLANT

INSTALLATION: Riverbank AAP, Riverbank, California.

OPERATOR: GOCO—Norris Industries, Inc.

MISSION/CAPABILITY: Manufactures metal parts for ICM grenades, 60mm and 81mm mortars, projectiles, and 105mm cartridge cases.

INVESTMENT, SIZE, PERSONNEL & MODERNIZATION: Estimated replacement value is $231 million. There are 792,500 square feet on 172 acres, most of which is devoted to industrial production. Current personnel strength is 8 Government and 69 contractor, with mobilization employment estimated at 2,500.

HISTORY: Built during WWI as an aluminum plant, Riverbank started its first ammunition production in 1952 in support of Korea. Production diminished until 1958 at which time the plant was laid away. In late 1966, the plant again was producing in support of Southeast Asia. The plant was again placed in standby in June 1976 and subsequently reactivated in 1978 for grenade production. From FY70 to FY82, over $14 million of modernized/expanded facilities have been constructed or are in-process.

p. SCRANTON ARMY AMMUNITION PLANT

INSTALLATION: Scranton AAP, Scranton, Pennsylvania.

OPERATOR: GOCO—Chamberlain Manufacturing Corporation.

MISSION/CAPABILITY: Manufactures metal parts for 155mm, 8–inch, and 175mm artillery munitions.

INVESTMENT, SIZE, PERSONNEL & MODERNIZATION. Estimated replacement value is $192 million. There are four major production buildings and one five-story administrative building on 15.3 acres. Current personnel strength is 22 Government and 480 contractor personnel employed. Mobilization employment is estimated at 2,040.

HISTORY: In 1952 DL&W Railroad shops were rehabilitated to meet shell metal parts requirements for the Korean emergency. The plant operated from December 1953 through March of 1963, at which time all contracts were terminated due to a labor dispute. Production was started again under the present contractor on 13 June 1963. The plant provided a high level of support to Southeast Asia requirements. From FY70 to FY82, over $49 million of modernized expanded facilities have been constructed or are in-process.

C–3. Inactive facilities.

a. Badger Army Ammunition Plant.

INSTALLATION: Badger AAP, Baraboo, Wisconsin.

OPERATOR: GOCO—Olin Corporation.

MISSION/CAPABILITY: Manufactures single- and double-base propellants, rocket propellant, and rocket grains.

INVESTMENT, SIZE, PERSONNEL & MOBILIZATION: Estimated replacement value is $760 million. There are 4.3 million square feet of facilities with about three-quarters devoted to manufacturing. There are 7,417 acres of land. Current standby employment is 7 Government and 341 contractor. Estimated mobilization employment is 8,750.

HISTORY: Construction was started in early 1942 and the plant produced millions of pounds of smokeless power, double-base rocket propellant, and E.C. powder during WWII. The plant remained in standby from 1945 to 1951. Reactivated in 1951, production totaled 286 million pounds in support of Korea. From 1958 to 1965 the plant again went into standby. Once again reactivated in 1965, the plant produced 446 million pounds in support of Southeast Asia. Since June 1975, the plant has been maintained in a standby status. From FY70 to FY82, over $55 million of modernization/expanded facilities have been constructed or are in-process.

b. Cornhusker Army Ammunition Plant.

INSTALLATION: Cornhusker AAP, Grand Island, Nebraska.

OPERATOR: GOCO—Mason and Hanger—Silas Mason Co., Inc.

MISSION/CAPABILITY: Loads, assembles, and packs major caliber ammunition, bombs, mines, and components.

INVESTMENT, SIZE, PERSONNEL, & MOBILIZATION: Estimated replacement value is $231 million. There are approximately 2.0 million square feet of facilities with about 60 percent devoted to manufacturing. There are 11,963 acres of land. Current standby employment is 4 Government and 81 contractor, with 3,000 estimated for mobilization.

HISTORY: Construction was started in March 1942. Initial production started November 1942 and continued for WWII. From late 1945 to February 1950, the plant was in standby. It was reactivated between April 1950 and early 1956, when it reverted to a layaway status. It was reactivated in September 1965 for Vietnam requirements. Peak employment during Vietnam was 5,169. By September 1974 all production facilities were again laid away. From FY70 to FY82 over $.2 million of modernized/expanded facilities have been constructed or are in-process.

c. Gateway Army Ammunition Plant.

INSTALLATION: Gateway AAP, St. Louis, Missouri.

OPERATOR: GOCO—Voss Machinery Co.

MISSION/CAPABILITY: Manufactures metal parts for major caliber ammunition.

INVESTMENT, SIZE, PERSONNEL & MODERNIZATION: Estimated replacement value is $118 million. There are 382,000 square feet of facilities with 288,000 square feet directly related to manufacturing. There are 14.9 acres of land; current employment consists of 15 contractor, with mobilization personnel estimated to be 745. This facility is currently in the process of being excessed.

HISTORY: Construction started in late 1942 with initial production beginning August 1943. It was used during WWII to produce heavy armor castings. During Korea, the plant produced medium tank armor castings. The facility was placed in layaway in 1954 and was idle from 1962 to 1967. Production of 175mm shell metal parts was initiated in December 1968 after an extensive rehabilitation program. The plant was laid away in a high readiness state on 30 September 1971. The plant has been declared excess to Army mobilization requirements, and disposal action was initiated in February 1980.

d. Hays Army Ammunition Plant.

INSTALLATION: Hays AAP, Pittsburgh, Pennsylvania.

OPERATOR: GOCO—Plant Facilities and Engineering, Inc.

MISSION/CAPABILITY: Manufactures metal parts for 105mm shell. Only Army plant having cold extrusion capability.

INVESTMENT, SIZE, PERSONNEL, & MODERNIZATION: Estimated replacement value is $69 million. The main plant is a building measuring 180 feet by 1,170 feet. There are 7.9 acres of land. Present standby employment is 11 contractor personnel, with mobilization requirements estimated at 1,650.

HISTORY: Built originally in 1942 for the Navy, Hays produced metal parts for 16–inch shells and also 5–inch breechblocks. The plant was transferred from the Navy to the Army in December 1966 and produced 250,000 105mm shells per month during 1968. Manufacture was concluded in May 1970, and layaway was completed in June 1971.

e. Joliet Army Ammunition Plant.

INSTALLATION: Joliet AAP, Joliet, Illinois.

OPERATOR: GOCO—Uniroyal, Inc.

MISSION/CAPABILITY: Loads, assembles, and packs medium and large caliber artillery ammunition and its components. Manufactures explosives such as TNT, TETRYL, and DNT.

INVESTMENT, SIZE, PERSONNEL, & MODERNIZATION: Estimated replacement value is $1,305 million. There are 1,496 buildings with 5.2 million square feet. About 25 percent of the square footage is devoted to manufacturing and 50% to supply. There are 23,543 acres of land. Current standby employment is 10 Government and 321 contractor, with mobilization employment estimated at 8,800.

HISTORY: A consolidation of Kankakee Ordnance Works and the Elwood Ordnance Plant, Joliet's construction was started in 1940. It was one of the largest producers of munitions during WWII. It was placed in standby status from 1945 until the Korean emergency. After rehabilitation and production in support of Korea, production from 1955 to 1965 was at a severely curtailed level with Elwood being put in standby in July 1965. Major reactivation occurred in 1966 to support Southeast Asia. From FY70 to FY82, over $104 million of modernized/expanded facilities have been constructed or are in-process.

f. Newport Army Ammunition Plant.

INSTALLATION: Newport AAP, Newport, Indiana.

OPERATOR: GOCO—Uniroyal Inc.

MISSION/CAPABILITY: Manufactures TNT. Has a major chemical agent capability.

INVESTMENT, SIZE, PERSONNEL & MODERNIZATION: Estimated replacement value is $310 million. There are over 1.5 million square feet of facilities with about one-third each devoted to production and storage facilities. There are 8,322 acres of land. Current standby employment is 8 Government and 292 contractor, with mobilization employment estimated to be 600.

HISTORY: Constructed as the Wabash River Ordnance Works in 1942, the plant produced extensive amounts of various explosives during WWII. The plant was laid away from 1946 to 1951. It was reactivated and again produced substantially for Korea. From 1957 to 1973, except for support of the chemical munition program, facilities were mostly inactive. In May 1973 modernized TNT lines began producing and continued through April 1974. TNT facilities were laid away in July 1975. Since FY70 no modernized/expanded facilities have been constructed or are in-process.

g. Ravenna Army Ammunition Plant.

INSTALLATION: Ravenna AAP, Ravenna, Ohio.

OPERATOR: GOCO-Ravenna Arsenal Inc. (Subsidiary of Firestone Tire & Rubber Company).

MISSION/CAPABILITY: Loads, assembles, and packs 155mm, 8–inch and 175mm projectiles, 4.2–inch mortars, and associated fuzes and primers. Excellent temperature/humidity-controlled storage facilities exist for industrial

production equipment (IPE).

INVESTMENT, SIZE, PERSONNEL & MODERNIZATION: Estimated replacement value is $920 million. There are 5.4 million square feet of covered facilities with about one-third devoted to industrial and two-thirds to storage uses. These are 21,419 acres. Current employment is 4 Government and 165 contractor with mobilization employment estimated at 5,200.

HISTORY: Constructed in 1941, the Portage Ordnance Depot and Ravenna Ordnance Plant produced major caliber ammunition in support of WWII. From 1945 to 1950, production activities were devoted to renovation and demilitarization. The plant produced from 1950 to 1957, then was placed in inactive status until 1961. From 1961 the plant was used for demilitarization of large bombs and shells. From 1968 to 1972 the plant produced grenades and shells in support of Southeast Asia. It has been in layaway status since June 1972. From FY70 to FY82 over $3.7 million of modernized/expanded facilities have been constructed or are in-process.

h. St. Louis Army Ammunition Plant.

INSTALLATION: St. Louis AAP, St. Louis, Missouri.

OPERATION: GOCO—Donovan Construction Company.

MISSION/CAPABILITY: Manufactures metal parts for medium caliber projectiles.

INVESTMENT, SIZE, PERSONNEL & MODERNIZATION: Estimated replacement value is $174 million. There are 450,000 feet of industrial plant facilities on 21.05 acres. Current employment consists of 4 Government and 15 contractor employees, with mobilization employment estimated at 2,500.

HISTORY: Construction began January 1941 and production was started in December 1941. The facilities operated during WWII and the Korean emergency. It was in standby from 1945 to 1951 and again from May 1954 to September 1966. The plant has been in layaway status since April 1970. From FY70 to FY82 under $1.0 million of modernized/ expanded facilities have been constructed.

i. Sunflower Army Ammunition Plant.

INSTALLATION: Sunflower AAP, DeSoto, Kansas.

OPERATOR: GOCO—Hercules Inc.

MISSION/CAPABILITY: Manufactures single-, double-, and triple-base propellants, rocket propellant, and rocket grains. Has the only Nitroguanidine manufacturing capability in the US.

INVESTMENT, SIZE, PERSONNEL & MODERNIZATION: Estimated replacement value is $883 million. There are 3.8 million square feet of facilities with about 65 percent devoted to manufacturing. There are 9,544 acres of land. Current standby employment is 9 Government and 583 contractor, with mobilization employment estimated at 6,500.

HISTORY: Construction was started in May 1942, and production of smokeless powder began 23 March 1943. During WWII, peak employment was 12,067, and over 200 million pounds of powder was produced. In July 1948, standby commenced and lasted until January 1951. Over 165 million pounds of powder was produced in support of Korea from January 1951 until May 1960, with a peak employment of 5,374. The plant was placed in standby from May 1960 until 20 August 1965, when it was reactivated for a 6-year period to support Southeast Asia. From FY70 to FY82, over $178 million of modernized/expanded facilities, including the nitroguanidine plant, have been constructed or committed.

j. Twin Cities Army Ammunition Plant.

INSTALLATION: Twin Cities AAP, New Brighton, Minnesota.

OPERATOR: GOCO—Donovan Construction Company and Federal Cartridge Company (Small Arms).

MISSION/CAPABILITY: Loads, assembles, and packs small caliber ammunition such as 5.56mm and 7.62mm. Also manufactures metal parts for 155mm shells.

INVESTMENT, SIZE, PERSONNEL & MODERNIZATION: Estimated replacement value is $587 million. There are 4.4 million square feet with almost 80 percent devoted to industrial production. There are 2,370 acres of land. Current standby employment is 7 Government and 128 contractor personnel, with mobilization employment estimated at 6,000.

HISTORY: Construction started in August 1941, and production began in February 1942. More than 4 billion rounds were produced during WWII. After WWII the plant was used for repack and demilitarization while in standby. Between August 1950 and December 1957, another 3.6 billion rounds of small arms were produced as well as 205 and 155mm shell metal parts. From August 1958 to December 1965, the plant was in standby status. Immediate reactivation was accomplished in December 1965 and from September 1966 to September 1973 almost 9 billion rounds were produced. The plant has been in layaway since October 1974 except for some shell metal parts production lines. From FY70 to FY82, over $18 million of modernized facilities have been constructed and committed.

k. Volunteer Army Ammunition Plant.

INSTALLATION: Volunteer AAP, Chattanooga, Tennessee.

OPERATOR: GOCO—ICI Americas, Inc.

MISSION/CAPABILITY: Manufactures TNT.

INVESTMENT, SIZE, PERSONNEL & MODERNIZATION: Estimated replacement value is $310 million. There are 1.1 million square feet of facilities with about 25 percent devoted to manufacturing, 40 percent to storage, and 20 percent to utilities. There are 7,300 acres of land. Current standby employment is 5 Government and 148 contractor, with mobilization employment estimated at 2,430.

HISTORY: Construction began in late 1941, and production started in July 1942. During WWII, 823 million pounds of TNT were produced. The plant was inactive between late 1945 and early 1952. During the period 1953 to 1957, another 283 million pounds were produced. The plant was inactive again between 1957 and 1966. It was reactivated on 29 April 1966 and operated continuously through March 1977. Since its inception, it has produced 1,765 million pounds of TNT. From FY70 to FY82, over $72 million of modernized facilities have been constructed or committed.

Glossary

Section I
Abbreviations

AAA
Army Ammunition Activity

AAE
Army Acquisition Executive

AAH
Advanced Attack Helicopter

AAIP
Army Ammunition Interoperability

AAO
Army Acquisition Objective

AAP
Army Ammunition Plan

AAP
Army Ammunition Plant

ABCA
America, Britain, Canada, Australia

ACR
Ammunition Condition Report

ADAM
Area Denial Artillery Munition

ADEN
Armament Development, Enfield

ADO
Army Distribution Objective

ADPE
Automatic Data Processing Equipment

AG
Army Guidance

AIF
Army Industrial Fund

AIRMS
Armament Industrial Readiness Management System

AITF
Ammunition Initiatives Task Force

AMDF
Army Master Data File

AMP
Army Materiel Plan

AMRAD
Armaments Munitions Requirements and Developments Committee

AMS–K
Ammunition Management System—Korea

APAM
Antipersonnel and Materiel

APC
Armored Personnel Carrier

APM
Army Program Memorandum

APE
Ammunition-Peculiar Equipment

AR
Army Regulation

ARNG
Army National Guard

ARRADCOM
US Army Armament Research and Development Command

ARRCOM
US Army Armament Materiel Readiness Command

ARSTAF
Army Staff

ASA(IL&FM)
Assistant Secretary of the Army (Installations, Logistics, and Financial Management)

ASA(RDA)
Assistant Secretary of the Army (Research, Development, and Acquisition)

ASARC
Army Systems Acquisitions Review Council

ASDA
Accountable Supply Distribution Activity

ASF
Army Stock Fund

ASP
Ammunition Supply Point

ASR
Available Supply Rate

BCS
Battery Computer System

BE
Belgium

BE
Base Ejection

BENELUX
Belgium, Netherlands, Luxembourg

BLSA
Basic Load Storage Area

BOIP
Basis of Issue Plan

CA
Canada

CA
Commercial Activities

CAA
US Army Concepts Analysis Agency

CALS
Committee for Ammunition Logistics Support

CARDS
Catalog of Approved Requirements Documents

CARES
Conventional Ammunition Readiness Evaluation System

CASPR
Conventional Ammunition Special Review

CBU
Cluster Bomb Unit

CG
Commanding General

CINCUSAREUR
Commander in Chief, US Army Europe

CLGP
Cannon-Launched Guided Projectile

CNAD
Conference of National Armament Directors

COCO
Contractor-Owned, Contractor-Operated

COE
Chief of Engineers

CONUS
Continental United States

COSIS
Care of Supplies in Storage

CSA
Chief of Staff, US Army

CSM
Chief of Staff Memorandum

CSR
Chief of Staff Regulation

CSR
Controlled Supply Rate

CTA
Common Table of Allowances

CTP
Coordinated Test Program

DALO–PL
ODCSLOG, Director of Plans, Readiness, and Systems

DALO–RM
ODCSLOG, Director of Resources and Management

DALO–SM
ODCSLOG, Director of Supply and Maintenance

DALO–TS
ODCSLOG, Director of Transportation, Energy, and Troop Support

DAMA–CSM
ODCSRDA, Munitions Division

DAMA–PPM
ODCSRDA, Policy, Plans and Management Division

DAMA–PPP
ODCSRDA, Procurement Programs and Budget Division

DAMA–PPR
ODCSRDA, RDTE Programs and Budget Division

DAMMS
Department of the Army Management Movement System

DAMO–FD
ODCSOPS, Force Management Directorate

DAMO–OD
ODCSOPS, Operations Readiness and Mobilization Directorate

DAMO–RQ
ODCSOPS, Requirements Directorate

DAMO–SS
ODCSOPS, Strategy, Plans and Policy Directorate

DAMPL
Director of the Army Master Priority List

DAPPL
Director of the Army Program Priority List

DARCOM
US Army Materiel Development and Readiness Command

DCP
Decision Coordinating Paper

DCSLOG
Deputy Chief of Staff for Logistics

DCSOPS
Deputy Chief of Staff for Operations and Plans

DCSRDA
Deputy Chief of Staff for Research, Development, and Acquisition

DDESB
DOD Explosives Safety Board

DEFA
Direction d'Etudes et Fabrication d'Armament

DESCOM
US Army Depot System Command

DIVAD
Division Air Defense (Gun) System

DOD
Department of Defense

DODAC
Department of Defense Ammunition Code

DODIC
DOD Identification Code

DP
Dual Purpose

DPM
Defense Program Memorandum

DSARC
Defense Systems Acquisition Review Council

DSU
Direct Support Unit

DT
Development Testing

DU
Depleted Uranium

ED
Engineering Development

EDCA
Executive Director for Conventional Ammunition

EOD
Explosive Ordnance Disposal

EPA
Extended Planning Institute

ET
Electronic Time (Fuze)

EUSA
US Eighth Army

FADAC
Field Artillery Digital Automatic Computer

FAE
Fuel Air Explosive

FASCAM
Family of Scatterable Mines

FCZ
Forward Communications Zone

FH
Field Howitzer (FRG)

FISO
Force Integration Staff Officer

FMS
Foreign Military Sales

FORSCOM
US Army Forces Command

FR
France

FRG
Federal Republic of Germany (now GE)

FSTS
Forward Storage Site

FY
Fiscal Year

FYPD
Five-Year Defense Program

FYTP
Five-Year Test Program

GE
Federal Republic of Germany

GEMSS
Ground-Emplaced Mine Scattering System

GMLR
Guided Missiles and Large Rockets (now MLRS)

GOCO
Government-Owned, Contractor-Operated

GOGO
Government-Owned, Government-Operated

GS
General Support

GSU
General Support Unit

HE
High Explosives

HEAT
High Explosives Antitank

HEP
High Explosive Plastic

HERA
High Explosive Rocket-Assisted

HEI
High Explosive Incendiary

HMX
High Melt Explosive

HQDA
Headquarters, Department of the Army

ICM
Improved Conventional Munitions

ILS
Integrated Logistic Support

IOC
Initial Operational Capability

IPE
Industrial Plant Equipment

IPF
Initial Production Facilities

IPP
Industrial Preparedness Program

IPR
In-Process Review

IWARS
Installation Worldwide Ammunition Reporting System

JCAP
Joint Conventional Ammunition Program

JMSNS
Justification for Major System New Start

JOPP
Joint Operating Policies and Procedures

JSPD
Joint Strategic Planning Document

KAMS
Korean Ammunition Management System

KE
Kinetic Energy

LAP
Load, Assemble, and Pack

LAW
Light Antitank Weapon

LOGSACS
Logistics Structure and Composition System

LOA
Letter of Agreement

LOI
Letter of Instruction

LP
Limited Production

LR
Letter Requirements

LRIP
Low-Rate Initial Production

LWCMS
Lightweight Company Mortar System

MAC
Military Airlift Command

MACOM
Major Command

MAP
Mission Area Panel

MENS
Mission Element Need Statement

NAIP
NATO Ammunition Interoperabilty Plan

M&E
Modernization and Expansion

MCA
Military Construction Army

MFP
Materiel Fielding Plan

MICOM
US Army Missile Command

MILSTAMP
Military Standard Transportation and Movement Procedures

MILSTRIP
Military Standard Requisitioning and Issue Procedures

MIPR
Military Interdepartmental Purchase Request

MLRS
Multiple Launch Rocket System

MMC
Materiel Management Center

MMT
Manufacturing Methods and Technology

MO
Multi-Option

MOA
Memorandum of Agreement

MOPMS
Modular Pack Mine System

MOS
Military Occupational Specialty

MOU
Memorandum of Understanding

MPBMA
Munitions Production Base Modernization Agency

MP
Multipurpose

MPTS
Metal Parts

MS^3
Munitions System Support Structure

MSC
Military Sealift Command

MSC
Major Subordinate Command

MTMC
Military Traffic Management Command

MTOE
Modification Table of Organization and Equipment

MTSQ
Mechanical Time Super Quick

MWARS
MACOM Worldwide Ammunition Reporting System

NAIP
NATO Ammunition Interoperability Plan

NATO
North Atlantic Treaty Organization

NDRF
National Defense Reserve Fleet

NETP
New Equipment Training Program

NGB
National Guard Bureau

NICP
National Inventory Control Board

NIIN
National Item Identification Number

NL
Netherlands

NOR
Norway

NSN
National Stock Number

OAP
Outline Acquisition Plan

O/C
Other Customer

OCSA
Office, Chief of Staff, US Army

ODCSLOG
Office, DCSLOG

ODCSOPS
Office, DCSOPS

ODCSPER
Office, DCSPER

ODCSRDA
Office, DCSRDA

OMA
Operation and Maintenance, Army

OPA
Other Procurement, Army

OPLANS
Operations Plans

OSD
Office, Secretary of Defense

OT
Operational Test

OTEA
US Army Operational Test and Evaluation Agency

PAA
Procurement of Ammunition, Army

PA&ED
Program Analysis and Evaluation Directorate

P&E
Propellant and Explosives

PARR
Program Analysis and Resource Review

PGB
Program Budget Guidance

PBC
Program Budget Committee

PBP
Production Base Plan

PBY
Type of Explosive

PEP
Plant Equipment Package

PEPMIS
Plant Equipment Package Information System

PIN
Pallet Identification Number

PIP
Product Improvement Proposal

PM
Project Manager

POM
Program Objective Memorandum

POMCUS
Prepositioning of Materiel Configured to Unit Sets

PPBS
Planning, Programing, and Budgeting System

PWRMS
Prepositioned War Reserve Materiel Stocks

PSP
Prestock Point

QA
Quality Assurance

QAR
Quarterly Ammunition Review

QASAS
Quality Assurance Specialist (Ammunition Surveillance)

QRS
Quick Reaction Site

RA
Rocket-Assisted

RAMIT
Relocatable Ammunition Magazine In-Theater

RAP
Rocket-Assisted Projectile

RASP
Reserve Ammunition Supply Point

RCZ
Rear Combat Zone

RDAISA
Research, Development, and Acquisition Information Systems Agency

RDF
Rapid Deployment Force

RDTE
Research, Development, Test, and Evaluation

RDX
Research Department Explosive

REFORGER
Return of Forces to Germany

RF
Radio Frequency

ROC
Required Operational Capability

ROKA
Republic of Korea Army

RSI
Rationalization, Standardization, and Interoperability

RSR
Required Supply Rates

S&A
Safing and Army

S/A
Security Assistance

SAA
Small Arms Ammunition

SAAS
Standard Army Ammunition System

SACS
Structure and Composition System

SAG
Study Advisory Group

SAILS
Standard Army Intermediate Level Supply

SALS
Standard Army Logistics System

SALS—K
Single Ammunition Logistics System-Korea

SAMPAM
Systems for Automation of Materiel Plans for Army Material

SCS
Special Contingency Stockpile

SELCOM
Select Committee

SLUFAE
Surface-Launched Unit, Fuel Air Explosive

SMCA
Single Manager for Conventional Ammunition

SP
Self-Propelled

STANAG
Standardized Agreement

STOG
Science and Technology Objective Guide

STRAF
US Strategic Army Forces

SUMS
Standard USAREUR Munitions System

TAA
Total Army Analysis

TAAC
Training Ammunition Authorization Committee

TAADS
The Army Authorization Documents System

TACFIRE
Tactical Fire Direction System

TAG
The Adjutant General

TAMIS
Training Ammunition Management Information System

TAMS
Training Ammunition Management System

TDA
Tables of Distribution and Allowances

TDP
Technical Data Package

TECOM
US Army Test and Evaluation Command

TIWG
Test Integrated Working Group

TMDE
Test, Measurement, and Diagnostic Equipment

TOA
Total Obligational Authority

TOE
Tables of Organization and Equipment

TP
Target Practice

TPFDL
Time-Phased Force Deployment List

TRADOC
US Army Training and Doctrine Command

UIC
Unit Identification Code

UK
United Kingdom

USAEARA
US Army Equipment Authorizations Review Activity

USALEA
US Army Logistics Evaluation Agency

USAREUR
US Army Europe

USARJ
US Army Japan

USARPAC
US Army Pacific

USN
United States Navy

VCSA
Vice Chief of Staff, Army

VSS
Vessel Support System

VT
Variable Time

VTAADS
Vertical TAADS

WARF
Wartime Replacement Factor

WARRAMP
Wartime Requirements for Ammunition, Materiel, and Personnel

WESTCOM
US Army Western Command

WARS
Worldwide Ammunition Reporting System

WP
White Phosphorus

WRSA
War Reserve Stocks For Allies

Section II
Terms
This section contains no entries.

Section III
Special Abbreviations and Terms
This section contains no entries.