TECHNICAL MANUAL

STORAGE AND MAINTENANCE OF ARMY PREPOSITIONED STOCK MATERIEL

SUPERSEDURE NOTICE: TM 38-470 dated 28 January 2022 supersedes TM 38-470 dated 30 June 2017, including all changes.

HEADQUARTERS, DEPARTMENT OF THE ARMY
28 January 2022

LIST OF EFFECTIVE PAGES/WORK PACKAGES

NOTE: This manual supersedes TM 38-470 dated 30 June 2017. Zero in the "Change No." column indicates an original page.

Date of issue for the revised manual is:

Original 28 January 2022

TOTAL NUMBER OF PAGES IN THIS PUBLICATION IS 164, CONSISTING OF THE FOLLOWING:

Page No.	Change No.	Page No.	Change No.
Cover	0		
i-iv	0		
1-1 thru 1-4	0		
2-1 thru 2-9	0		
3-1 thru 3-18	0		
4-1 thru 4-4	0		
5-1 thru 5-55	0		
6-1 thru 6-13	0		
7-1 thru 7-4	0		
8-1 thru 8-2	0		
A-1 thru A-12	0		
B-1 thru B-3	0		
C-1 thru C-4	0		
D-1 thru D-2	0		
E-1 thru E-2	0		
F-1 thru F-3	0		
G-1 thru G-4	0		
H-1	0		
I-1 thru I-2	0		
J-1 thru J-4	0		

TECHNICAL MANUAL
No. 38-470

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D.C., 28 January 2022

STORAGE AND MAINTENANCE OF ARMY PREPOSITIONED STOCK MATERIEL

Users are encouraged to submit recommended changes or suggestions for improvement. Comments shall be submitted on DA Form 2028 (Recommended Changes to Publications and Blank Forms). Comments and recommendations shall be keyed to a specific page, paragraph, and line of text. Reasons shall be provided to ensure understanding and complete evaluation. A point of contact shall also be provided. Comments shall be forwarded to Commander, U.S. Army Sustainment Command; Packaging, Storage, and Containerization Center; ATTN: AMXLS--P; 11 Hap Arnold Boulevard; Tobyhanna, PA 18466-5097, or call DSN 795-7257 or (570) 615-7257; send facsimile to DSN 795-7894 or (570) 615-7894; or email to usarmy.tyad.usamc.mbx.pt@army.mil.

			Paragraph	*Page*
CHAPTER	1.	INTRODUCTION ……..……	1.1	1-1
SECTION	I.	Purpose……..	1.1	1-1
	II.	Scope……..…	1.2	1-1
	III.	Technical Assistance and Deviations……....	1.3	1-1
	IV.	Explanations of Terms……..…	1.4	1-1
	V.	Environmental Requirements……..…	1.5	1-3
	VI.	Radioactive Material…….....	1.6	1-3
	VII.	Wood Packaging Materials (WPM)…….....	1.7	1-3
CHAPTER	2.	STORAGE OPERATIONS……..……	2.1	2-1
SECTION	I.	Policy……..……	2.1	2-1
	II.	Controlled Humidity (CH) Storage……..…..	2.2	2-3
	III.	Open Storage……..……	2.3	2-4
	IV.	Physical Security……..…...	2.4	2-5
	V.	Segregated Items……..…..	2.5	2-5
	VI.	Inventory Planning and Control……..…..	2.6	2-6
	VII.	Locator System……....	2.7	2-7
	IX.	Shelf-life (SL) Management……..…	2.9	2-7
	X.	Release and Loan of APS Stock……...….	2.11	2-8

			Paragraph	Page
CHAPTER	3.	MAINTENANCE OPERATIONS	3.1	3-1
SECTION	I.	Policy	3.1	3-1
	II.	Maintenance Guidance	3.2	3-3
	III.	Petroleum, Oils, Lubricants (POL)Sampling	3.3	3-10
	IV.	Cyclic Maintenance	3.4	3-15
	V.	Maintenance Functions for Watercraft	3.5	3-18
CHAPTER	4.	QUALITY ASSURANCE	4.1	4-1
SECTION	I.	Policy	4.1	4-1
	II.	Proofing and Process	4.2	4-1
	III.	Quality Audits	4.4	4-2
	IV.	Procedures Review and Evaluation	4.5	4-2
	V.	Internal Quality Data	4.6	4-2
	VI.	External Quality Data	4.8	4-2
	VII.	Data Evaluation	4.8	4-4
CHAPTER	5.	PREPARING EQUIPMENT FOR STORAGE (PHASE 1)	5.1	5-1
SECTION	I.	Policy	5.1	5-1
	II.	Inspection	5.2	5-1
	III.	Special Provision	5.3	5-4
	IV.	Cleaning Procedures	5.4	5-6
	V.	Drying	5.5	5-8
	VI.	Military Packaging	5.6	5-8
	VII.	Lubrication	5.7	5-8
	VIII.	Minor Rework	5.8	5-8
	IX.	Tank/Automotive Equipment	5.9	5-9
	X.	Weapons	5.10	5-21
	XI.	Communications/Electronics Equipment	5.11	5-23
	XII.	Support Equipment	5.12	5-27
	XIII	Water Craft (HLPS/TAC-S)	5.13	5-37
	XIV.	Medical Equipment	5.15	5-50
	XV.	Aviation & Missile Equipment	5.16	5-54
	XVI.	Containerization Materiel (Inter-modal Transportable Containers)	5.17	5-55
	XVII.	Supply Class V	5.18	5-55
CHAPTER	6.	CARE OF EQUIPMENT AND SUPPLIES IN STORGE (PHASE II)	6.1	6-1
SECTION	I.	General	6.1	6-1
	II.	Surveillance Inspection	6.2	6-2
	III.	Exercising	6.3	6-4
	IV.	Modified Work Orders (MWO)	6.4	6-8
	V.	Supplemental Armor Kits	6.5	6-9
	VI.	High Mobility Artillery Rocket System (HIMARS) & Multiple Launch Rocket System (MLRS M270A1)	6.6	6-10
	VII.	Objective Gunner Protection Kit (O-GPK) & Common Remotely Operated Weapons Station (CROWS)	6.7	6-13
CHAPTER	7.	ISSUE FROM STORAGE (PHASE III)	7.1	7-1

SECTION	I.	Policy……	7.1	7-1
	II.	General……	7.2	7-1
	III.	Planning……	7.3	7-1
	IV.	Activation and De-processing…….....	7.4	7-2
CHAPTER	8.	RECORDS AND REPORTING……..	8.1	8-1
SECTION	I.	General……	8.1	8-1
	II.	DA Pamphlet 750-8, The Army Maintenance Management System User's Manual……..	8.2	8-1
	III.	Humidity Control Record Charts…….....	8.3	8-1
	IV.	Readiness Reporting……	8.4	8-2

			Page
APPENDICES	A.	GENERAL REFERENCES……..	A-1
	B.	SPECIFICATIONS AND NATIONAL STOCK NUMBER FOR PACKAGING MATERIALS……	B-1
	C.	PETROLEUM SAMPLING PROCEDURES AND EQUIPMENT……...	C-1
	D.	CALCULATING SAMPLE SIZE AND REQUIRED SAMPLE QUANTITY FOR TESTING …….	D-1
	E.	AOAP SAMPLING PROCEDURES AND SUPPLIES…….....	E-1
	F.	ENGLISH-METRIC CONVERSION…….....	F-1
	G.	ACRONYMS……..	G-1
	H.	RADIATION SAFETY POINTS OF CONTACT……	H-1
	I.	PATRIOT MISSILE SYSTEM INTEGRATION AND CHECKOUT (SICO) PROCEDURES……..	I-1
	J.	USAMMA MEDICAL LOGISTICS SUPPORT TEAM (MLST)…….....	J-1
FIGURES	1-1	APS Phases……...	1-2
	J-1	MLST Organizational Structure…….....	J-2
	J-2	DA Form 2028……	J-3
TABLES	3-1	Fuel Sampling and Testing Requirements……	3-12
	3-2	Petroleum Sampling Log……..	3-13
	3-3	Equipment Classification and Sampling Level……	3-13
	3-4	Sample Quantities By Equipment Category…….	3-14
	3-5	Type of Sample for Tracked Vehicles……	3-14
	3-6	Inspection Frequency Of Supply Class IX Materiel Without Specific Shelf-life Assigned……..	3-17
	5-1	Pneumatic Tire Shelf-life……	5-4
	5-2	Virgin/New Antifreeze……...	5-11
	5-3	Recycling Antifreeze……	5-13
	5-4	Breather Assembly Materials……..	5-24
	5-5	Adapter Panel Materials……..	5-25
	5-6	Materials for Recharging Static Free Breather System……..	5-54

6-1	Stages of Corrosion……..	6-4
6-2	Non-Cyclic Maintenance Exercising Guide……...	6-9
6-3	Non-Cyclic APS-3 Maintenance Exercising Guide……..	6-9
B-1	Specifications and National Stock Numbers for Packaging Materials……..	B-1
C-1	Correction Factors for API Gravity…….	C-3
C-2	Petroleum Sampling Equipment…….	C-4
D-1	Number of Samples for Class III (P) Lot/Batch……	D-1
D-2	Required Sample Quantities for Testing……	D-2
E-1	Sampling Supplies……	E-2
F-1	Standard English-Metric Equivalents…….	F-1
F-2	English-Metric Conversions…….	F-1

CHAPTER 1
INTRODUCTION

1.1 PURPOSE

a. This technical manual (TM) sets forth procedural requirements and guidance for preparation, maintenance, preservation of materiel for storage, care of supplies in storage (COSIS), and de-preservation instructions that will be accomplished during maintenance cycles, while in storage, and at time of issue. The procedures herein will be used with equipment groups and activities assigned the mission for storage and maintenance of Army Prepositioned Stock (APS).

b. Equipment will be maintained and tracked in accordance with equipment technical manuals, Interactive Electronic Technical Manuals (IETMs), and AR 750-1, Army Materiel Maintenance Policy.

c. These procedures will not be used for purposes other than stated herein except upon approval of Headquarters, Department of the Army (HQDA), and Deputy Chief of Staff for Logistics (DCSLOG).

1.2 SCOPE

a. This TM prescribes procedures for the storage, maintenance, inspection, preservation, and de-preservation required to support the materiel and supplies designated for the APS stocks. These requirements shall be used in the planning for funding, developing load plans, contractor support, labor requirements, equipment and supplies usage, facility construction/modification, and for establishment of prepositioned materiel projects.

b. This TM sets forth storage care criteria to be used in maintaining and reporting the operational readiness of prepositioned materiel. The standards presented are the minimum acceptable for APS assets. When required by Headquarters, U.S. Army Materiel Command (HQ AMC) and the U.S. Army Sustainment Command (ASC), additional standards may be implemented.

1.3 TECHNICAL ASSISTANCE AND DEVIATIONS

a. Users are also encouraged to request technical assistance relative to the contents of this TM from Headquarters, U.S. Army Sustainment Command (ASC), ATTN: AMSAS-SPA, Rock Island, IL 61299-6500. Requests may be e-mailed to usarmy.ria.asc.mbx.coic@army.mil, or transmitted via facsimile to DSN 793-4236 or commercial phone (309) 782-4815.

b. Deviations or waivers from the requirements contained in this manual must be approved prior to implementation. The APS site needs to submit a memo from the Battalion Commander to the ASC Commander requesting a waiver for the deviation. The memo needs to include information on how the deviation correlates to readiness and cost. Reference the standard that is being changed, and the new process. Electronically sent approved waiver to PSCC Mailbox: usarmy.tyad.usamc.mbx.pt@army.mil.

1.4 EXPLANATION OF TERMS

For purpose of interpretation and clarification, the following definitions are provided. In addition, abbreviations contained in AR 740-1, Storage and Supply Activity Operations, may be used.

a. Maintenance. Army Regulation (AR) 750-1, Army Material Maintenance Policy, Paragraph 3-2, The Army Maintenance Standard defines how assets are to be placed in storage. Those testing, repairing, and modification actions performed to ensure that the materiel meets or exceeds TM -10/-23 or -24 and IETM requirements prior to the start of each new cycle, and is ready for use within the prescribed reaction time.

b. When items are not placed into long term storage, short term storage COSIS guidance is provided in TM 38-8145-709, Care of Supplies in Storage.

c. Preparation of equipment for storage (Phase I). Those actions necessary to ensure equipment meet TM -10/-23 or -24 and IETM maintenance standards and are preserved to prevent deterioration while in storage (figure 1-1).

d. Inspection/survey and exercising during storage (Phase II). Those actions related to the surveillance of materiel and exercising of the equipment/components while in storage to maintain equipment throughout the cycle (figure 1-1).

e. Issue from storage (Phase III). Those actions necessary to de-preserve and provide equipment during handoff (figure 1-1). The standard for handoff of equipment is TM -10/20 as defined in AR 750-1, paragraph 3-2. Transfer of Class I, II, IIIP, IV or IX will be Supply Condition Code A, B or C as defined AR 725-50.

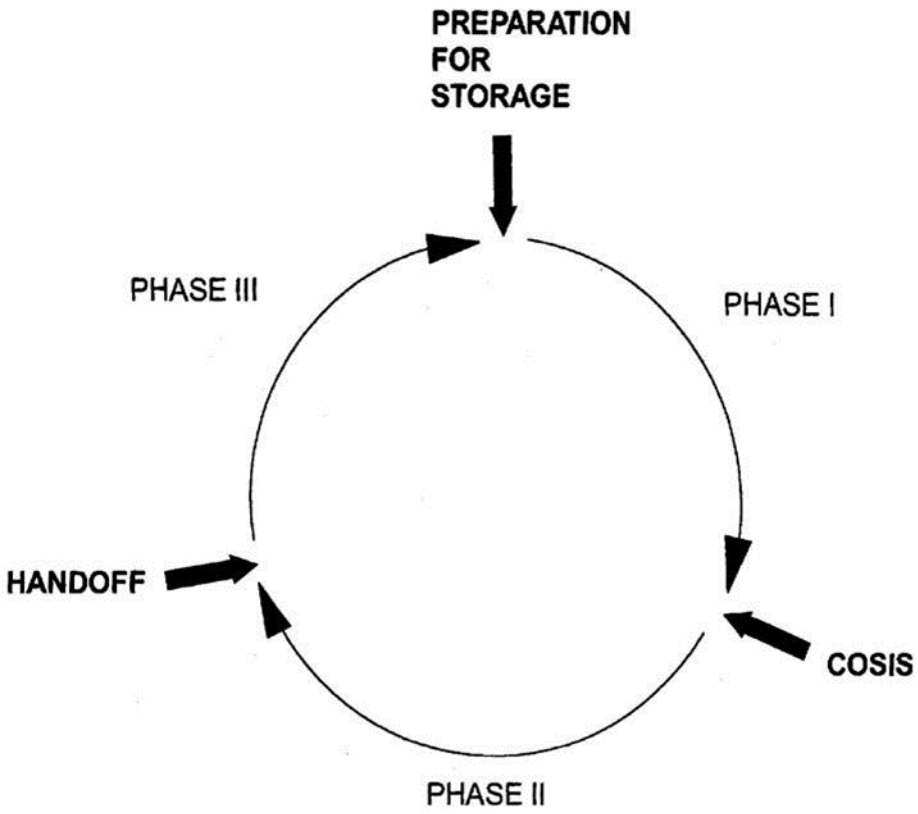

Figure 1-1. APS Phases

f. Physical security. That part of security concerned with measures to safeguard personnel; to prevent unauthorized access to facilities, equipment, material, and documents; and to safeguard against espionage, sabotage, hostile acts, vandalism, damage, and theft.

g. Military preservation. Application of protective measures to minimize deterioration including cleaning, drying, preservative materials, barrier materials, cushioning, and containers. Designed to protect an item during shipment, handling, indeterminate storage, and distribution to consignees worldwide.

h. Serviceability testing. Operation of mechanical, electrical, communication equipment and electronic equipment for a sufficient period to ensure equipment is maintained.

i. Storage, controlled humidity (CH). An area wherein the environment's relative humidity (RH) is controlled and maintained by special equipment within parameters specific to equipment type and structure/vessel. Climate controlled or temperature controlled cooling, such as air conditioning, does not constitute CH or dehumidification as intended for COSIS. Temperature reduction can inadvertently increase relative humidity, which is detrimental to the intended storage conditions.

j. Storage, non-CH, enclosed. An area in which the temperature and RH are not controlled, however, it provides protection from direct entry of salt air, sun, rain, and wind.

k. Storage, open, open-deck loaded, without CH environment. An unenclosed location where materiel will be directly exposed to the elements (salt spray, deck wash, rain, and snow) while in storage.

l. Containerization. A type of transport equipment designed to move goods by one or more modes of transportation without intermediate handling of the contents. (This includes ISO containers.)

m. Shelf-life (SL) Items

(1) Type I. An individual item of supply with a definite non-extendible period of SL.

(2) Type II. An individual item of supply having an assigned shelf-life period that may be extended after completion of visual inspection, certified laboratory test, restorative action, or a combination of these measures.

n. Visual inspection. Visual inspection of materiel in the storage location without disassembly, use of measurement devices, or performance testing.

o. Large Medium Speed Roll-on/roll-off (LMSR) vessels. These vessels are designed as primary vehicle transports. Cargoes include wheeled, tracked, self-propelled, and towed vehicles and equipment. Rapid cargo loading and discharge operations characterize these vessels. This is accomplished by using a series of external and internal ramps and cargo operations.

p. Preventive Maintenance Checks and Services (PMCS). See AR 750-1 for further definition of the standard for performing PMCS. Care, servicing, inspection, detection, and correction of minor faults before these faults cause serious damage, failure, or injury. Requirements are found in -10 and -23 or 24 equipment TMs, IETMs, and Lubrication Orders (LO).

q. Download. The discharge of prepositioned equipment from an APS-3 ship.

r. TM -10/23 or 24 and IETM Maintenance Standard. The condition of equipment when-

(1) The equipment is IAW AR 750-1, paragraph 3-2.

s. Military levels of packing as defined by MIL-STD-2073-1.

(1) Level A. Protection required to meet the most severe worldwide shipment, handling, and storage conditions. It must, in tandem with the applied preservation, be capable of protecting materiel from the effects of direct exposure to extremes of climate, terrain, and operational and transportation environments.

(2) Level B. Protection required to meet moderate worldwide shipment, handling, and storage conditions. A Level B pack must, in tandem with the applied preservation, be capable of protecting materiel not directly exposed to extremes of climate, terrain, and operational transportation environments.

t. Shed Storage. A single storage building with one or more sides unenclosed.

u. Inventory System of Record (ISR). Operation Order (OPORD) 047-20, Accelerated Sunsetting of the Army War Reserve Deployment System (AWRDS), Army Prepositioned Stocks (APS) to Global Combat Support System Army (GCSS-Army), indicates that HQ AMC approved and directed the acceleration of APS/AWRDS transition to GCSS-Army to be completed not later than end of first quarter, Fiscal Year 2022. Some APS locations will still be utilizing AWARDS and Logistic Modernization Program (LMP) while others will have completed the transition to GCSS-Army. ISR is used in TM 38-470 to reference which ever system the specific APS location is utilizing.

1.5 ENVIRONMENTAL REQUIREMENTS

a. HQ AMC must comply with the requirements of AR 200-1, Environmental Protection and Enhancement when implementing this TM. When implementing outside the United States, host nation environmental quality laws and regulations, in accordance with DoD Instruction 4715.5, must also be incorporated.

1.6 RADIOACTIVE MATERIAL

a. HQ AMC must comply with the requirements of AR 200-1, Environmental Protection and Enhancement when implementing this TM. When implementing outside the United States, host nation environmental quality laws and regulations, in accordance with DoD Instruction 4715.5, must also be incorporated.

1.7 WOOD PACKAGING MATERIAL (WPM)

a. DoDM 4140.65 establishes guidance for the issue, use, and disposal of WPM in compliance with International Standards for Phytosanitary Measures (ISPM) Number 15 (also known as ISPM 15). WPM includes, but is not limited to, wood pallets, skids, load boards, pallet collars, crates, boxes, reels, dunnage, frames, and cleats composed of non-manufactured wood. WPM made of exempt materials but combined with solid non-manufactured wood components must still be treated and marked. Packaging materials that are not required to be treated and marked are materials that have undergone a manufacturing process such as manufactured (processed) wood products (e.g., plywood, particleboard, oriented strand board (OSB), and veneers). Additionally, pieces of wood that are less than 6 millimeters (mm) (or 1/4 inch) in any dimension are not required to be treated and marked.

b. Foreign manufacturers shall comply with ISPM 15, and have the WPM heat treatment and marking verified in accordance with their National Plant Protection Organization's compliance program.

c. DoD approved WPM treatment processes can be found in DoDM 4140.65, July 2, 2020 Section 3

(1) WPM may be constructed of HT lumber (treated to 56 degrees Celsius (C) or 132.8 degrees Fahrenheit (F) (core temperature) for 30 continuous minutes) or constructed from untreated lumber and then heat treated to 56 degrees C or 132.8 F (core temperature) for 30 minutes as certified by an ALSC accredited agency in accordance with DoDM 4140.65 and the ALSC Regulations (American Lumber Standard Committee, Incorporated, “Wood Packaging Material Enforcement Regulations,” November 7, 2014 and Wood Packaging Material Policy, November 7, 2013).

Note

2013-13 CPM-8 adopted revised Annex 1 to ISPM 15 to include heat treatment using dielectric heating. When lumber or used, previously assembled, repaired or remanufactured wood packaging material is heat treated using dielectric heating the treatment code mark shall be dehumidification (DH).

(2) WPM may be chemically treated with MB as established in the American Lumber Standard Committee, Incorporated Fumigated Wood/ Fumigated Wood Packaging Material Enforcement Regulations, November 7, 2014. Fumigation at a location outside the United States shall be performed in accordance with the status of forces agreement with the host nation and applied according to the ISPM- 15 fumigation schedule.

d. Removal of bark is required regardless of type of treatment applied. However, any number of separate small pieces of bark may remain if they are either:

(1) Less than 1 1/4 inches (3 centimeters (cm)) in width (regardless of the length); or If greater than 1 1/4 inches (3 cm) in width, the total surface area of an individual piece of bark is less than 7 3/4 square inches (50 square cm).

e. DoD approved WPM treatment processes can be found in DoDM 4140.65, July 2, 2020 Section 3.

(1) In accordance with ISPM 15, containers shall be marked on at least two opposite sides. Pallet markings shall be applied to the side of the stringer or end of the block on diagonally opposite sides and ends of the pallet and be contrasting and clearly visible.

(2) d. All dunnage used in configuring and securing the load shall also comply with ISPM 15 and be marked with an approved dunnage stamp.

CHAPTER 2
STORAGE OPERATIONS

SECTION 1. POLICY

2.1 GENERAL

a. AR 740-1 sets forth and defines the policies, which apply to the storage of Army materiel. The policies covering prepositioning programs require that materiel activities be planned, managed, and performed as storage operations to the extent military mission's permit.

b. APS assets will be configured aboard the vessels or in warehouses in accordance with U.S. Coast Guard (vessels only), HQ DA, and Office of The Surgeon General (OTSG) guidance. Equipment and containers on APS-3 vessels will be lashed to the decks to prevent movement and shall be inspected monthly. Equipment exercising requirements must be considered when planning stowage/storage configurations. As a minimum, APS Afloat equipment will be exercised every six months afloat on those pieces of equipment the stow plan allows access to.

c. CH storage is the authorized method for APS materiel

(1) Items which do not tend to deteriorate can be excluded from this environment provided approval is given by the ASC and the appropriate MSC APS office.

(2) Interiors of APS watercraft, whether in dry or wet storage, will have a DH environment.

d. Open storage will only be used for materiel authorized for such storage. Materiel requiring CH storage, but placed in open storage, will need considerably more preservation to minimize deterioration, maintenance facility capacity will require increased surveillance to ascertain materiel readiness, and increased COSIS.

e. National Inventory Control Point (NICP) will ensure that replacement equipment is sent to the APS location when materiel that requires maintenance is beyond the repair capabilities of the installation. Materiel that is less than Army maintenance standard will not be prepositioned unless authorized by HQDA, Army Material Command (AMC), and the U.S. Army Component of the Combatant Commander. Materiel that is awaiting repair or disposition will be placed in CH storage (if space permits) to preclude deterioration. Equipment received without service records will be inspected and serviced in accordance with Army maintenance standards and this manual. Service records will be created by the APS activity.

f. Even though reaction time is critical to the success of APS, inventory control and compliance with security regulations may require certain equipment to be separated from the end item. In the case where there exist security regulatory requirement(s). The activity shall physically separate the sub-components from the parent asset ensuring compliance. The Army organization or activity responsible for issuing the equipment will have the stow/storage and issue plans which allow for quick issue of such equipment. Also, the contractor shipboard COSIS team will have a copy of the stow plan to facilitate surveillance inspections and exercising requirements. AMC created the Logistics Support Element (LSE) to address the requirement for a unit that could be tailored to provide Reception, Staging, Onward Movement, and Integration support as outlined in ATP 3-35.1. Personnel from various AMC staff the LSE, to include the U.S. Army Medical Materiel Agency Medical Logistics Support Team (USAMMA-MLST). These personnel may be military, civilian, or contractor. See Appendix J for the complete explanation of the USAMMA MLS.

g. Security procedures for storage of items classified as sensitive or pilferable will be per AR 190-1.

h. Security procedures for storage of Arms, Ammunition, and Explosives (AA&E) will be handled IAW AR 190-11. Contractors at ground maintenance facilities and shipboard maintenance teams on APS vessels must be trained, certified, and authorized on DA Form 7281. All APS sites will adhere to key control procedures IAW AR 190-11. Keys to arms storage buildings, rooms, racks, and containers will be maintained separately from other keys and accessible only to those individuals whose official duties require access to them.

(1) Security procedures for storage of items will be adhered to controlling Controlled Cryptographic Items (CCI). CCI in standard logistics channels will be managed under the provisions of AR 710-2 and AR 725-50. Asset reporting will be done according to AR 710-3.

(2) Both AA&E items and CCI items will be containerized on prepositioned stocks afloat, be placed behind double protection measures, using limited authorized key control access procedures, documented and monitored by authorized personnel. AA&E and CCI storage containers will be monitored and inspected IAW regulations / policies and integrated into the inspection process and Command Supply Discipline Programs.

(3) Valuable storage space is gained by secondary cargo loading (i.e., stacking of boxed materiel, electronic shelters, generators, and so forth) into the bed of trailers or vehicles when possible. Maintenance cycles and

vehicles exercises must be weighed prior to using any method to gain space utilization efficiency as determined by site SOP and not be mandated by this TM. Equipment must be properly secured to eliminate the possibility of damage to the equipment and/or the trailers or vehicles. The load limits of the equipment must be observed to prevent overload of the system. Unit set integrity shall be maintained at all times, preferably by using assigned UIC's and storing set equipment together. Medical Equipment Sets and Medical Materiel Sets will not be placed as a secondary load in any vehicle or trailer. These assets will be placed in MILVANS or ISO-Shelters only.

i. Uploading and containerization will be utilized to the maximum extent possible to conserve storage space and decrease the time to issue equipment. Appropriate blocking and bracing will be accomplished. In conjunction with this, the following equipment will be containerized:

(1) CCI directed to be containerized

(2) Shop Stock

(3) Authorized Stockage Lists (ASL)

(4) AA&E

(5) Operational Projects as applicable

(6) TMDE

(7) Other items as directed by HQs, DA, AMC, OTSG, USAMMA, and/or ASC

NOTE

At selected sites, storage plans may necessitate unique configurations to meet the mission of the site. These configurations are authorized; however, the ASC Executive Director for Support Operations must approve these deviations.

j. Weapons removed from vehicles and watercraft will be stored in accordance with the following:

(1) Open storage is prohibited for AA&E.

(2) Weapons will be stored in an arms room, or containers designated as an arms room, on wooden or metal racks to facilitate inspection of serial number, cleanliness, modification work order (MWO) status, and preservation, when available. Weapons may also be boxed and crated as in normal depot storage per procedural guidelines in AR 190-1.

(3) IAW AR 190-11, key control, access control, and personnel certification adherence, ISO, or other authorized containers, may be used to store weapons when an arms room is not available. The container must be secured, locked, and inspected.

k. Tarpaulins will remain installed on trailers and trucks unless removal will enhance care of supplies in storage.

l. Towed equipment such as trailers, field kitchens, and so forth shall be positioned directly behind a prime mover, whenever practical, to facilitate rapid issue and unloading.

m. Separate storage is authorized for materials that require special considerations (for example, hazardous materials, physical security regulations).

n. Wet storage moorings are normally used for larger watercraft, Landing Craft Utility/Large Tug/Barge Derrick (LCU/LT/BD), and dry storage cradles for smaller craft, Landing Craft Mechanized/Small Tug (LCM/ST). Interiors of watercraft are subject to preservation and dehumidification. Wet and dry stored watercraft require regular surveillance and COSIS to all exposed surfaces and items of deck mounted equipment.

o. Sulfuric acid electrolyte aboard the APS-3 ships to support sustainment and unit basic load requirements will be removed when the ships return to port for their maintenance cycle.

p. Weather deck stowage for United States Army Tank-automotive and Armaments Command (TACOM) equipment is not authorized without approval of TACOM and the ASC Commander.

q. Whenever practical, items requiring calibration in accordance with TB 43-180 will be stored together.

r. Radioactive Items/commodities will be stored in a weather protected, ventilated, secured, posted and easily de-contaminable storage containers/location. The exception being radioactive items that are on end items like tanks and howitzers, etc. The end items having the radioactive items need to be secured. The postings for radioactive items/commodities outside of the end items (tanks, howitzers, etc.) falling under NRC licenses require “Caution Radioactive Materials”; NRC Form 3 (8-2017), Energy Reorganization Action of 1974 (Public Law 93-438); a No Drinking, Smoking, Eating, Chewing or Applying Cosmetics indication, and whom to contact in an emergency. A copy of the applicable NRC license; 10 CFR Parts 19, 20 and 21 and the SOP would have to be posted, unless indication is made where to review the documents. Also, non-radioactive items/commodities/materials, food/drinks, flammables, combustibles, explosives, and live animals cannot be stored with the radioactive items/commodities outside of the end item (tanks, howitzers, etc.). Further, the radioactive item/commodity outside of the end item (tanks, howitzers, etc.) storage location must be located as far from personnel, live animals and non-compatible items/commodities. In addition, a radioactive item/commodity inventory will be kept, and reported to the appropriate item managers annually. Access to the radioactive items/commodities storage area outside of the end items will be limited to reduce any potential exposures. If the storage area is damaged or on fire or flooded or the end item (tank, howitzer, etc.) with radioactive items/commodities is damaged or involved in a fire), the respective NRC license holder or item manager and the emergency responders will be contacted immediately for appropriate actions. The emergency responders notified of the hazard. In addition, notification will be provided to the respective NRC license holder and item manager for lost or unaccounted for or stolen radioactive items/commodities/materials to include end items with the radioactive items/commodities/materials.

s. Military Exempt Lasers will be secured and accounted for with annual or appropriate reporting to the item managers.

t. Systems with Basic Issue Items (BII) containing Radioactive Items/Commodities, The BII containing radioactive items/commodities will be separately stored from the system. The storage being in accordance with para. 2-1.r. as a radioactive item/commodity and not an end item.

u. The ASC Battery Maintenance Management Plan indicates battery maintainers with pulse technology are the preferred method for ongoing diagnostics and preventative maintenance in APS storage (e.g. Pulsates). For land based preventive maintenance equipment, the plan suggests use of the 24-Volt Drop/Pulse reel via the 24-Volt Grid System for reel connection. All batteries shall be actively maintained with pulse technology while in storage. This applies to batteries in vehicles, equipment, and segregated. For APS Afloat, use and application is subject to Ship Master approval.

SECTION II CONTROLLED HUMIDITY (CH) STORAGE

2.2 PLANNING AND OPERATION

a. At land-based sites, servicing maintaining and inspecting the operation of installed CH equipment is the responsibility of the facility manager (IMCOM / Joint Installations). CH storage, when properly planned and designed, requires minimum surveillance and maintenance. Humidity control systems are not maintenance free and therefore, require a moderate amount of inspection and preventive maintenance. Care shall be taken to prevent the RH from dropping below 30% or rising above 50% during storage and access of equipment. Do not add moisture through a humidifier to any storage warehouse. CH storage conditions that are naturally below 30% RH are acceptable. System performance must achieve controlled humidity recovery to 50% or below RH within 96hrs of uncontrolled conditions. During CH static state/controlled conditions, no measured readings shall be greater than 50% RH. Relative humidity sensors must be located appropriately for a stable 40% +/- 10 RH. Sensors shall have an accuracy of 5% or better. Additionally, systems for controlling humidity shall be selected with consideration for life cycle cost, reliability/projected down time, and maintenance requirements. Preferred methods of controlling humidity for APS storage is mechanical condensing systems. Desiccant systems are not generally the preferred/recommended method for CH storage. Other storage processes or preservative packaging, which do not control humidity, are not approved (e.g. vapor corrosion inhibitor (VCI) and moisture transfer films).

b. Vessel environmental controls on LMSR vessels, monitoring maintenance and inspection of installed CH equipment is the responsibility of the Ship’s Master. LMSR vessels will maintain ambient temperatures between 40-80 degrees Fahrenheit and RH between 40-60%. The Ammunition Sustainment vessels will maintain ambient temperature not to exceed 85 degrees Fahrenheit and relative humidity between 30-50%. Arrangement for servicing equipment in CH arrangements on APS-3 vessels is the responsibility of the Ship's Master. At land-based sites, servicing CH equipment is the responsibility of the Installation administrator (IMCOM / Joint Installations). CH storage, when properly planned and designed, requires minimum surveillance and maintenance. Humidity control systems are not maintenance free and therefore, require a moderate amount of inspection and preventive maintenance. A CH environment shall have a RH level of 40%. Care shall be taken to prevent the RH from dropping below 30% or rising about 50% for periods of more than 48 hours.

c. If equipment is operated within the confines of a building or vessel prior to issue or for purpose of exercising the equipment, all hulls or warehouse doors shall be opened with the gas exhaust removal systems operating, if so equipped. ASC and the appropriate MSC must be notified of any specific model vehicle/equipment not being exercised and the reasons for not exercising.

d. Cargo doors, personnel hatches, and other accesses to storage areas will be kept closed and secured, except for essential entry/exit, while personnel are working. During scheduled vehicle engine exercising, humidity control equipment shall be shut down if hulls are opened. If shut down, CH equipment shall be returned to service immediately upon completion of the exercising. Cargo doors at both ends of a building will not be opened at the same time unless equipment is being issued or exercised.

e. All materiel will be stored in a CH environment or packaged to military preservation standards and stowed in ISO-Shelters. ASC and the appropriate War Reserve commodity manager must approve any materiel excluded from a CH environment.

f. Under no circumstances will medical containers or AA&E containers (ISO-Shelters or MILVANs) be opened while aboard ship without the explicit direction of the DA G-4 or USAMMA Commander.

g. The majority of CH facilities are traditional storage warehouses constructed of concrete, cement blocks, or metal-clad panels, that have been vapor sealed, insofar as economically feasible. Depending on the building's height, floor dimensions and load bearing capacities, CH warehouses can provide a corrosion resistant environment for the storage of APS materiel and supplies. Nontraditional CH facilities, such as portable metal-clad shelters or flexible, water-vapor resistant material (i.e., PVC, urethane, etc.) bags or tunnels, provide corrosion resistant dry air systems that can be used when traditional CH warehouses are not available. These nontraditional CH shelters can be constructed so that they will provide a dry air environment to a specific weapon system (i.e., combat vehicles) or be constructed like a tunnel to hold various sized vehicles and other classes of APS stock. Both types of CH facilities provide a corrosion resistant environment. Nonstandard CH shelters / tunnels must have verifiable and maintainable CH of 40% +/- 10 to prevent increase of COSIS cycle times.

h. All CH facilities will have a site plan whereby the integrity of each CH system is periodically evaluated. Structural and dry air system inspections must be performed weekly. RH and temperature data must also be collected weekly and retained for each facility.

i. Motorized vehicles on APS-3 vessels shall be stored with their fuel tanks/cells between 1/2 and 3/4 full. Motorized vehicles on APS-3 vessels will have both positive and negative battery terminals disconnected as they are stowed. Non self-propelled equipment such as generators, heaters, and so forth can be stored with or without fuel. Residual fuel will be treated as specified herein. Fueling operations shall be conducted at the staging areas at the seaport of debarkation.

j. Equipment on APS-3 vessels will be lashed to the deck to prevent movement. Containerized materiel will be stacked to the appropriate height and lashed to the deck.

NOTE

Gasoline burning equipment will be stored without fuel.

k. Vehicles and other powered equipment at land-based sites can be stored with 1/2 to 3/4 tank of fuel if local building codes and environmental laws permit. It is recommended that fueling operations for Phase 3 (Issue) be conducted directly outside the building if spill containment is available. If spill containment is not available, vehicles shall be towed to a fuel point. In specific instances whereby spill containment is installed in a warehouse, fueling operations may be conducted in the building with the site-commanders authorization.

l. JP-8 is the preferred fuel for all APS equipment. No gasoline or Naphtha based fuels (i.e., gasoline, JP-4, aviation gasoline) will be stored with the equipment in storage. Where diesel fuel is used, it must be treated, see paragraph 5.9 e. (1) (b).

SECTION III. OPEN STORAGE

2.3 PLANNING AND OPERATIONS

a. The restrictions imposed on storage patterns in covered facilities do not apply to open storage. When space permits, materiel should be stored in a manner which permits easy entry and movement of equipment. A variety of storage patterns are possible in open storage. Patterns shown in TM 38-400 are suggested but may be varied to suit conditions.

b. If permitted by space constraints, sufficient space will be left between rows to allow for removal of individual pieces of equipment without movement of other materiel when materiel must be stored in the open and space. Planning must be given to provide sufficient space to permit the use of cranes or other materials handling equipment (MHE). Sufficient space will be provided on sides, front, and rear to permit inspection and performance of minor repairs such as paint touchup and so forth.

c. When materiel must be placed in open storage, roadways between rows will be of sufficient widths to permit removal of individual vehicles without the need for excessive backing and steering to maneuver the vehicle onto the roadway. Consideration must be given to providing sufficient space to permit the use of towing equipment and prime movers, plus semi-trailers. When there are not overriding considerations, vehicular equipment can be most efficiently stored in relation to the roadway when placed at a moderate angle to the roadway. Sufficient space will be provided on the sides, front, and rear to permit inspection and performance of minor repairs such as flat tires, paint touch up, etc. Aisles are not necessary unless a double row of vehicles is stored back to back. When this storage arrangement is used, aisle space of at least 18 inches will be provided between the rows at the rear of the vehicles.

d. Materiel placed in open storage shall be protected from rain, snow, wind, sand, etc., utilizing tarps, plastic sheeting or any other barrier material. If this protection is provided, vehicles and equipment shall have the vents, drain plugs, etc., open to permit maximum airflow through the equipment. TB 43-0213 defines requirements for corrosion prevention and control for equipment in open storage.

(1) If tarps/plastic sheeting protection is not provided then vents and drain plugs are not required to remain open unless unauthorized by host nation rules/regulations. Vents, Drain plugs will remain closed to eliminate flow of dust and particles. If vents and drain plugs are closed, inspections will be conducted during the monthly surveillance inspection to ensure visual issues and water build up are identified and proper drainage is Performed

NOTE

Spacing shall be provided between the covering and equipment to prevent condensation. A way to allow air to flow through the vehicles, without allowing outside elements to enter, will be implemented.

e. All vehicles shall be stored on a level surface whenever possible. If a level surface is not available, care must be taken to ensure that the engine is higher than the fuel tank to prevent fuel or preservation oil from leaking down into the engine and causing a hydrostatic lock of the engine.

f. Vehicles and equipment stowed outside must have some type of spill containment material, device, process, or inspection to prevent ground contamination and protect the environment.

g. Materiel selected for open deck on APS-3 vessels will have special preservation requirements determined by HQ AMC major subordinate commands, USAMMA, or appropriate commodity manager. ASC PSCC, ATTN: AMAS-SPI, Tobyhanna, PA 18466-5097 shall be contacted for appropriate requirements.

SECTION IV. PHYSICAL SECURITY

2.4 GENERAL

a. Planning and providing physical security against pilferage cannot be over emphasized. Pilfering of mirrors, windshield wiper blades, electrical components, and sensitive items can adversely affect deployment. The need for security extends to items in repair parts stockage as well as property book items.

b. Sensitive items, because of their vulnerability to theft, sabotage, espionage, damage, and potential use by terrorist groups, require constant protection and control. Sensitive items are identified in the Army Master Data File (AMDF). Detailed physical security guidance for conventional arms ammunition, explosives, and communications security (COMSEC) are contained in DoD 5100.76-M, AR 190-11, AR 190-13, AR 190-51, and AR 380-5. Guidance for controlled medical substances and other medically sensitive items is contained in AR 190-51. Inventory requirements for sensitive items are contained in AR 740-26, and Military Standard Transaction Reporting and Accountability Procedures (MILSTRAP) AMCL 8A.

c. Pilferable items are also identified in AMDF and are normally those items having an immediate resale value or potential for personal use.

d. Self-propelled vehicles/equipment must be secured so it cannot be readily started and/or operated when parked/unattended IAW AR 190-51.

e. Requirements of the Unique Item Tracking (UIT) Program shall be enforced in accordance with AR 710-3. The UIT Program comprises four subprograms: DoD Small Arms Serialization Program; Security Risk Category I Non-nuclear Missiles and Rockets; (RASTS) Radiation Source Tracking System (formerly Radiation Testing Tracking System, RATTS); and the Controlled Cryptographic Items Serialization Program.

SECTION V. SEGREGATED ITEMS

2.5 OVERVIEW

a. APS ASL and Shop Stock may be segregated from the major end item and stored by UIC. The materials will be identified using the appropriate codes.

b. The site commander will determine the location of segregated materiel. In no case will the reassembling of segregated materiel with its end item delay the deployment of the equipment.

c. HAWKER, OPTIMA, and other absorbed glass mat (AGM) type battery stocks to support contingency issue will be stored on the same vessel or at the same APS storage site as the equipment. HAWKER batteries are stored in the shipboard battery room, not in containers. Stored Batteries will be tested and charged every 90 – 120 days to extend SL. Batteries can be stored within battery maintenance facility. ASC Battery Maintenance Management Plan shall be used. All batteries shall be actively maintained with pulse technology maintainers while in land based storage and with the approval of the Ship Master for afloat storage. Additionally, with the use of pulse technology maintainers on batteries in storage or in vehicles their SL and useful life will be greatly extended.

d. The ASC Battery Maintenance Management Plan should be used; TB 9-6140-252-13.

NOTE

Heat is a major factor in battery maintenance frequency. For every 18°F above 78°F, the discharge rate approximately doubles.

(1) Valve regulated Lead Acid Batteries (e.g., Absorbed Glass Mat (AGM)) and activated flooded lead acid batteries will be maintained in accordance with ASC's Battery Maintenance Management Plan, TB 9-6140-252-13, and manufacturer recommendations.

(2) When excessive quantities are on-hand (e.g., field exercises) batteries shall be redistributed to using units to avoid loss through deterioration.

(a) Operation of Afloat Battery facilities will be IAW AFSBn-Charleston Battery Maintenance Management Plan and MSC Ship Captains guidance.

(b) APS3's AFSBn-Charleston ground maintenance battery production, sustainment, recovery, and charging capability must be capable of handling the battery through-put equivalent to a Brigade Combat Team or Sustainment Brigades (SB) within a 109 day window.

(c) All uploaded batteries will be hot charged and pass quality control for cold cranking power 30 days or less to vessel upload dates.

(d) APS3 Afloat will harness emerging battery technologies into its program as they become available; e.g., Solar Chargers for short term staging yard storage, quick charge capacitors, etc.

(e) APS3 Afloat will utilize to the fullest extent possible the AGM type battery on all battery operated APS3 equipment.

(f) APS3 Afloat will ensure both battery terminals are disconnected as the equipment is stowed on the ship by the stevedores.

e. All industrial gases such as oxygen, nitrogen, and acetylene will be stored in accordance with AR 700-68, Occupational Safety and Health Administration (OSHA), and Host National laws.

SECTION VI. INVENTORY PLANNING AND CONTROL

2.6 GENERAL

a. The physical inventory control program will meet the requirements of DOD 4000.25-2, as amended, approved MILSTRAP Change Letter 8A, AR 740-26 and AR 710-1.

(1) Supply Class VII APS authorizations are distributed by U.S. Force Management via FMS WEB. APS sites receive the MTOE file and can determine changes in equipment authorizations. ASL, shop stocks, and sustainment stocks retention levels are calculated annually in the appropriate ISR. Authorizations for Operational Projects are maintained by ASC, PSCC and are available on DLA managed site, Asset Visibility(AV), https://www.igc.ustranscom.mil/igc/unauth/welcomeAV.xhtml.

(2) Location, condition, and MWO/SOUM/MAM/GPM status of each item must be accurately recorded in the ISR. The ISR and other systems provide an Interface with the Modification Management Information System. Maintenance location information must be current for those MWO/SOUM/MAM/GPM identified for application.

(3) On-hand quantities must be known as well as materiel due in.

(4) Inventories and location surveys must be performed as required by guidelines of the appropriate ISR and wholesale stocks. These guidelines currently are DOD 4000.25-2, AR 740-26, and MILSTRAP Change Letter 8A (AMCL 8A), and AR 710-1. Results of these actions must be available as well as controls established to assure correction of discrepancies.

(5) ISR will provide the custodial records and the accountable records for storage sites.

b. The USAMMA database will be used for MES and MMS inventory down to component level.

SECTION VII. LOCATOR SYSTEM

2.7 OVERVIEW

a. Each APS site and APS-3 vessel will have a system to record the location of each piece of APS inventory. The location system and record forms will be uniform for all vessels, supply, and maintenance sites. The requirements of TM 38-400 are to be used as guidance in the development of the location system. Whether or not a centralized stock locator record is maintained for projects having more than one location, each site or vessel will have locally available, records of material locations.

b. A stow/storage plan of each storage area is required. In addition to showing the layout, the plan can also be used to locate vehicles by applying serial numbers to the plan's display. Equipment positioning by UICs can also be depicted on plans.

c. Accountability will be maintained and tracked in the appropriate ISR.

2.8 GENERAL

The organization responsible for maintenance and care of supplies in storage of APS equipment will establish controls and procedures to ensure operation of an effective repair parts stockage program. Repair parts stockage will be in accordance with AR 710-1 and the AMC supplements.

a. COSIS must be performed on all material stored at APS sites. Particular emphasis will be conducted on those reparable repair parts (Recoverability Code F, D, H and L) which are normal part of the unit set ASL, operational projects or shop stock. These repair parts must be preserved and packed in accordance with MIL-STD-2073-1, packaged, stored, and protected from the elements, especially when stored in outside storage sheds or in containers.

b. BII that is stored on vehicles must be inspected at least once annually to ensure that components are serviceable, not damaged, illuminating if applicable and rust free. A random sampling methodology to determine serviceability and accountability may be utilized if BII is vacuum packed or similarly stored as long as the seal is not broken and it is IAW AR 740-26 sampling table. If radioactive items/commodities are damaged or not illuminating, the local Radiation Safety Officer and NRC license holder will be contacted immediately for appropriate actions. Damaged or non-illuminating item will be wipe tested for radioactive contamination and sealed in double clear bags with marking to indicate radioactive material is inside; e.g. “Broken Tritium, DO NOT OPEN” or “Non-illuminating Tritium, DO NOT OPEN”. The personnel handling the items must have appropriate PPE. Disposition will be determined after the wipe test results are received.

SECTION VIII: SHELF-LIFE (SL) MANAGMENT

2.9 RESPONSIBILITIES

a. Army Materiel Command (AMC) will establish policy and provide oversight for this program. ASC, PSCC is AMC’s responsible organization for the SL Management Program. OTSG/USAMMA will establish policy and provide oversight for class VIII.

b. Major Subordinate Commands (MSC) will develop and submit a detail rotations plan for assets under their management to AMC, APS Division no later than the fourth quarter of each FY, the MSC will develop and submit to AMC, APS Division a detailed rotation plan, utilizing data provided by ASC, for assets under their management. The plan will cover the next FY rotation and will be coordinated directly with ASC and will detail the specific assets, quantity, and quarter project rotation will be accomplished as well as the shipping and receiving locations. Rotation Plan will be coordinated directly with ASC. AMC recognizes in some cases due to the nature of the stock, rotation may not be possible. In this case, MSCs will develop a process by which disposition instructions are issued automatically when Supply Condition Code in the IRS is H. Additionally, budgeting requirements for replacement for assets that cannot be rotated will be developed utilizing ASC database and will accompany budget request as justification for funding.

c. ASC will develop, validate and implement a tracking program for SL management. SL information to be captured includes: Storage location, project codes, batch/lot number, manufacture/cure/pack/packaging/assembly date, inspect/test or expiration date and contract number for all SL items. ASC will establish a website and post information for MSCs utilization. Information will be updated annually by third quarter of the FY to reflect stock to be rotated in next FY. ASC will monitor and coordinate with MSCs to ensure disposition instructions are issued to the site per TM 38-470 a timely manner. ASC will monitor the disposition instruction creation and coordinate with MSCs to ensure they are issued to the site in a timely manner. ASC will work directly with MSCs and DLA to ensure maximum rotation of stock.

d. Sites will ensure information outlined in c above is entered into ASC established tracking system(s) at point of receipt and updated as required based on SL extension (Type II).

2.10 GENERAL

a. APS sites shall integrate SL management and training into their receipt, storage, and surveillance process in accordance with the DoDM 4140.27 Volume I and II, DoD SL Program Administration and Volume II, DoD SL Management Program: Materiel Quality Control Storage Standards., available on the DoD SL web site at https://www.shelflife.dla.mil/ under the Policy tab, or by contacting ASC, PSCC.

b. APS requirements for storage of SL items must be minimized during requirements determination process to the greatest extent possible to reduce the resources necessary for to management of the program.

c. ISR will be used for tracking SL.

d. APS sites will establish and document a SL surveillance process as part of their Quality Assurance Program in order to review their inventories to identify all the items with SL requirements and ensure required data is entered into ASC's tracking system. Surveillance will be conducted as outlined in DoDM 4140.27 Volume I, Volume II, and applicable Army Regulatory guidance.

e. Type I (Non-extendible) SL items must be downgraded from supply condition codes A to B to C to H in (or J for repairable) accordance with the timeframes specified in DoDM 4140.27 Volume II. MSCs shall fill retail requisitions, on a free issue basis, with materiel that is being downgraded at the site to minimize the disposal of expired SL items and their associated costs. Once the item reaches its expiration date, the APS site shall process it through either DLA Disposition Services or the local contractor IAW local procedures. The site will contact the ASC Service Item Control Team (SICT) for disposition instructions when disposition instructions are needed.

f. APS sites shall inspect and test Type II (Extendible) shelf-life items IAW the Supply Storage Standards identified in DoDM 4140.27 Volume II. ASC established a website and posts information for MSC utilization for this program (https://www.pscc.army.mil/Packaging-and-Transportation-Division/Shelf-Life-Management/).

g. Type II (Extendible) SL items require a visual inspection, and/or certified laboratory/ machine test, and/or restoration to determine if a SL extension is warranted. If the material requires a visual inspection, it must be inspected at least six months prior to the inspection/test date to minimize materiel migrating to a lower condition code (per Global Combat System-Army (GCSS-A), batch code) (DD Form 1225, Storage Quality Control Report is required). If the material requires laboratory testing, at least nine months prior to the inspect/test date, the APS site shall first check if the material has been extended by accessing the DOD Quality Status Listing (QSL) at https://www.shelflife.dla.mil/. If the QSL does not have any test results available, and the materiel requires laboratory test, the APS site shall request disposition instructions from ASC (SICT) by submitting a DD Form 1225, "Storage Quality Control Report," in accordance with DLAI 4145.4/AR 740-3/AFJMAN 23-125(IP)/NAVSUPINST 4400.100/MCO 4450. While the APS sites wait for the laboratory test results or disposition instructions from ASC, the item shall be downgraded from supply condition code A to B to C to J IAW timeframes specified in paragraph 2.10.e, above. Material that cannot be extended shall be classified supply condition code H and processed for disposal through either the DLA Disposition Services or local contractor IAW local procedures. In accordance with DOD policy, materiel shall not remain in condition code J for longer than 90 days, unless the material is in an OCONUS storage location and then for no longer than 180 days. Once the materiel passes the inspection/test, the APS site shall establish a new inspect/test date for the item and condition code. Next, inspect/test dates for materiel undergoing visual inspection only will be computed by adding the extension months to the date of the most recent inspect/test date marked on the package. Next inspect/test dates for materiel undergoing testing or restoration will be provided by the testing or maintenance activity. Extended materiel will be remarked with the revised inspect/test date by affixing a DD Form 2477-series, "Shelf-Life Extension Notice," to all exterior, intermediate, and unit pack containers during storage and upon issue or shipment.

h. Chemical, Biological, Radiological and Nuclear (CBRN) SL assets will be extended utilizing the Mobility Inventory Control and Accountability System (MICAS). ASC will do a manual monthly update from ISR to MICAS.

i. Class VIII Type I SL management testing: Reference AR 40-61, Medical Logistics Policies and Procedures, and SB 8-75-11 for SL management guidance.

j. APS-3 SL Management is the exception to the rule. Requirements, which are specified to support afloat mission, will be loaded. AMC will accept SL loss for these assets due to the nature of APS-3 mission set. During the requirements determination process, AMC will limit the loss on these assets to the greatest extent possible.

SECTION X. RELEASE AND ISSUE OF APS STOCK

2.11 GENERAL

a. All issues of APS stock must be coordinated with and approved by HQDA G3/5/7/G4. All APS issues will be in accordance with AR 710-1, Chapter 6.

b. In the event of war or major regional conflict, APS stocks will be released as directed by the Chairman, Joint Chiefs of Staff (CJCS) or the Chief of Staff, Army. Unit sets will be released/issued by the sites, in their entirety, whenever possible.

c. In the event of a contingency, units should request APS assets through their supported Combatant Commander to HQDA G3/5/7/G4.T he supported Combined Intelligence Center (CINC) must validate all requests for APS stocks in support of contingency.

d. HQ AMC and OTSG may authorize issue of secondary items (spares and repair parts) from APS assets (purpose codes B, C, and D) to fill emergency peacetime operational requirements (issue priority 01-03, not mission capable requisitions only). The unit must provide a funded requisition and the item manager must assure APS stocks can be replenished within 120 days after issue before the secondary items may be issued.

CHAPTER 3
MAINTENANCE OPERATIONS

SECTION I. POLICY

3.1 GENERAL

a. Maintenance of APS materiel consists of those actions required to ensure that materiel is in accordance with AR 750-1 and DA Pam 750-8. Equipment will be maintained IAW Army Maintenance Regulations to standards utilizing appropriate Technical Manuals and respective IETMs. Maintenance will be performed in the appropriate maintenance facility for the level of maintenance, as designated by the Maintenance Allocation Chart and as it relates to Field and Sustainment Level maintenance. Additional levels of maintenance in support of the APS mission may occur due to the use of equipment for training or specialized requirements from PM item managers. This activity shall be planned for in facility capacity and capabilities for work beyond COSIS or unit level maintenance. The additional work or repairs required will be reimbursed as part of the training cost and not APS.

b. Equipment items will not be placed in APS storage unless they are 10-20 IAW AR 750-1, Chapter 3, Section 1, para 3-2. Technical Manuals, and/or IETMs will be utilized to determine if assets are IAW AR 750-1, paragraph 3-2. Request for wavier from standards in AR 750-1, paragraph 3-2 will be submitted HQDA G4 for approval. As for watercraft operations where a Technical Manuals do not establish the maintenance or readiness standard, utilize Government marine survey standards or MSC approved commercial standards.

c. Upon receipt, materiel under warranty will be operated and inspected for serviceability. Warranty claims will be submitted in accordance with DA Pam 750-8.

d. AOAP oil analysis for ground equipment shall be performed in accordance with AR 750-1, DA PAM 750-8, TB 43-0211, and current DA/AMC/ASC guidance as follows:

(1) Oil analysis is only required on equipment enrolled in the AOAP. Tactical wheeled vehicles no longer require AOAP samples to be taken. A list of currently enrolled equipment can be found at Army Enterprise Systems Integration Program (AESIP), https://idmng.armyerp.army.mil/oamcustomlogin/.

(2) When establishing the baseline sample (enrollment into the AOAP) initial samples shall be taken from the current oil in the component.

(3) Engine and transmission oil will be changed in APS equipment whenever there is evidence of contamination (e.g. oil, water), if equipment issued for Temp Loan or exercises – (change oil and filters base on Technical Manual requirement), when mechanical conditions dictate, or after:

(a) 50 hours of operation while in a storage condition, or,

(b) 500 miles on equipment with no hour meter.

(c) When a previous sample result is inconclusive (re-test required).

NOTE

Operational acceptability is based on AOAP. The AOAP improve operational readiness of APS equipment, enhance safety, detect impending component failures, and conserve petroleum resources through application of the on condition oil change (OCOC) policy. AOAP monitors lubricants for the presence of contaminants, abrasive part wear, and review of prescribed physical properties and consolidates analytical data in support of diagnostic and/or prognostic maintenance processes.

(4) Oil Analysis will be performed for an exercise and again at turn-in after use for equipment enrolled in the AOAP program.

(a) Oil samples will not be taken from equipment when an AOAP laboratory is not available in theater.

(b) During handoff personnel will do the following:

1. Conduct checks during download to detect the two most common storage related oil problems: moisture and fuel contamination.

2. Will provide results from the last AOAP sample to the gaining unit, at the gaining unit commander’s request.

3. Continue to execute the program at both land and afloat sites in accordance with reference DA PAM 750-8 during normal maintenance cycles.

4. Components not enrolled in the AOAP. The useful life of these lubricants, fluids, and hydraulic oils shall be as specified in the applicable equipment TMs.

(i) CH Storage. Components will be evaluated at each maintenance cycle. If no time limit is specified it shall be changed every 3 maintenance cycles.

(ii) Non-CH Storage. Components will be evaluated every 12 months. If no time limit is specified in the applicable TM, the fluids shall be changed every maintenance cycle.

NOTE

AOAP methodology primarily measures wear debris and in no way can measure the effectiveness of the preservative ingredients. MIL-PRF-21260 is internal combustion engine operational oil, which is subject to AOAP to determine when it needs to be changed under operational conditions.

5. The record procedures prescribed in DA Pam 750-8 will be used during all phases of maintenance. The records shall be maintained with equipment records while in storage.

6. Each APS site must possess or have immediate access to the following:

(i) Personnel with the military occupational specialties (MOSs) or civilian equivalents, able to perform authorized levels of maintenance and preservation on all equipment, which is located at the APS site.

(ii) TMs; test, measurement, and diagnostic equipment (TMDE); weapon system unique special tools and test sets; and shop tools required to perform the authorized level of maintenance and preservation.

(iii) Adequate facilities must be made available to perform maintenance functions.

7. Radio Frequency Identification (RFID)

(i) All APS assets shall utilize RF tags for shipment visibility. APS organizational equipment (rolling stock and individual end items), containerized shipments or palletized shipments, Unit loads (tri-wall package, commercial fiberboard package), Transport Unit (cartons, boxes-second level packaging) and cased (package) shipments (freight containers, MILVANS of all sizes, air pallets, tri-wall containers) moving to, from, or between overseas locations (including retrograde and APS-3 vessels), will be tagged with active data-rich Radio Frequency Identification (RFID) tags written with content level detail IAW approved formats (RF-Tag Data Format Specification, Version 2.0, or a more current version) with the exception of non-military air shipments. The RFID tag format standards can be found at http://www.acq.osd.mil/log/sci/ait.html. The RFID tag data shall be forwarded to the regional ITV server.

(ii) When preparing APS-3 equipment/materiel for upload, the RFID tags will be written and applied to the items while staged for upload (prior to convoy/delivery to the port).

(iii) Local policy will dictate the use of RFID tags for equipment in static storage at APS sites.

8. Item Unique Identification (IUID)

(i) All Army property subject to Item Unique Identification (IUID) policy will be marked with Unique Item Identifiers (UIIs) and registered in the DoD IUID. The Army must uniquely identify the items to which it takes title in order to provide better asset accountability, valuation and life cycle management. Unique identification provides the Army the opportunity to differentiate an individual item from all others IAW MIL-STD-130. Unique identification of items provides the Army with the source data to facilitate accomplishment of the following:

1. Improve the acquisition of equipment and performance based logistics services for the Warfighter.

2. Capture timely, accurate and reliable data on items (i.e., equipment, repairable, materials, and consumables)

3. Improve life-cycle asset management

4. Track items in the Department and industry systems for operational, logistic and financial accountability purposes.

(ii) It is DoD policy that Government furnished equipment be recorded in the DoD IUID Registry, except for items with an acquisition cost of less than $5,000 that are not identified as serially managed, mission essential, sensitive, or controlled inventory, unless the terms and conditions of the contract state otherwise. Radioactive items/commodities will have maintenance performed in accordance with item TMs, applicable NRC licenses, Maintenance Advisory Messages (MAMs), Ground Precautionary Messages (GPMs) and Safety of Use Messages (SOUMs).

SECTION II. MAINTENACE GUIDANCE

3.2 CALIBRATION, MWOs, EQUIPMENT DISPOSITION AND SERVICEABILITY TESTING

a. Calibration

(1) Each APS site will establish and maintain a Calibration Support Coordinator in accordance with AR 750-43 and TB 750-25.

(2) All APS stored TMDE, except items stored aboard APS-3 vessels, will be calibrated in accordance with intervals specified in TB 43-180. TMDE stored aboard APS-3 vessels will be calibrated during maintenance cycles or prior to hand off.

(3) All APS stored TMDE will be scheduled in the normal cyclic maintenance program and will conform to the following requirements:

(a) PMCS will be accomplished in accordance with published procedures and regulations. Materiel will show ability to perform intended functions by evidence of exercising and testing prescribed in DA Pam 750-1

(b) Materiel failing the above criteria will be submitted to the Calibration Lab in the normal manner for repair and return.

(c) Contingent upon deployment of TMDE, the designated APS Calibration Support Coordinator will be informed by the AMC LSE and U.S. Army Test, Measurement, and Diagnostic Equipment Activity (USATA). The supporting Calibration lab will provide calibration and repair in accordance with TB 43-180 and TB 750-25.

1. AMC authorizes USATA to conduct calibration and repair support mission operations for the APS-3 assigned TMDE assets at the point of need. Based upon a TMDE asset review, USATA is responsible calibration and/or repair actions.

2. USATA will be responsible for all items contained within their containers aboard APS-3 ships. An inventory will be conducted by the USATA hand receipt holder, and the equipment will be maintained and calibrated as necessary whenever the ship carrying the equipment docks to perform the equipment download and maintenance cycle. Once the internal items receive their necessary care and inspections, USATA will affix a copy of the signed inventory with seal number(s) both inside and outside of the container. The container will then be sealed with a numbered container seal, and the seal numbers will be recorded by the USATA hand receipt holder as well as the APS-3 Accountable Office.

(i) USATA will coordinate with APS supporting agencies and/or organizations for logistical support agreements to execute calibration and repair support responsibilities.

3. AFSBn Charleston will be responsible for upload/download, securing and staging the containers on and off the ships. Semi-annually the onboard maintenance contractor will verify the condition of the container(s) and ensure the seals are still intact. They will then take date time stamped pictures of the intact seals on the containers(s) and send those pictures to the APS-3 Accountable Officer. The APS-3 Accountable Officer will forward the pictures to the USATA hand receipt holder for their proof of inventory records. In the event of a hand receipt holder changeover at USATA, AFSBn Charleston will assist in facilitating the movement of the person out the vessel to inspect the container. This will be done IAW the APS-3 periodic ship inspection schedule.

(d) Periodic (biennially) TMDE workload inventory and validation will occur between the owning APS and USATA.

(e) All APS in-transit calibration and repair occurrences that require USATA to send materiel & personnel assets shall require an operational, movement, or travel approval order by the owning APS Command.

(4) The M41A7 TOW (Tube Launched, Optically Tracked, Wireless Guided) ITAS (Improved Target Acquisition System) Weapon System stored at APS sites are exempt from the annual service required in TM 9-5865-923-23&P. The only components of the TOW ITAS Weapon System that require services while in storage are the Lithium-Ion Battery Box (LBB) and the Position Attitude Determination Subsystem (PADS) Battery. The exemption of the M41A7 TOW ITAS Weapon System Annual Service does not waive the requirement to fully charge all of the TOW ITAS LBBS or PADS batteries.

(a) IAW the MOA between ASC and TOW Product Office, Tactical Aviation and Ground Munitions Project Office, Program Executive Office Missiles and Space dated OCT 2021, the TOW ITAS LBBs must be fully charged to a 10 Bar State of Charge monthly.

1. 1. Prior to charging the LBB review Work Packages 44, 45 and 47 in TM 9-1425-923-10.

(b) IAW the MOA between ASC and TOW Product Office, Tactical Aviation and Ground Munitions Project Office, Program Executive Office Missiles and Space dated OCT 2021, the ITAS PADS batteries must be fully charged quarterly.

(c) For additional information on ITAS, reference TM 9-1425-923-10 Operator's Manual.

(d) If the APS Support Team experience any issues while charging the LBBs or PADSs or they need to contact the TOW Product Office for any reason, contact the TOW ITAS Logistics Team, TOW Product Office, Tactical Aviation and Ground Munitions Project Office at Redstone Arsenal:

1. NIPR Email usarmy.redstone.peo-ms.mbx.tagm-security-office@mail.mil

2. SIPR Email usarmy.redstone.peo-ms.list.mslsjams@mail.smil.mil

3. WAR ROOM Open: 24 Hours Commercial: (256) 842-0295, DSN: 788-0295, Fax: (256) 313-3290

4. Mail: Program Executive Office Missiles and Space Tactical Aviation and Ground Munitions Project Office ATTN: SFAE-MSL-TAL 100 Secured Gateway Huntsville, AL 35808

(5) Automatic Fire Extinguisher System (AFES). TACOM has a recommended work-around to the Bradley Fighting Vehicle System (BFVS) AFES battery discharge by turning the AFES control to maintenance mode; this will stop the auto-sensing. Ensure the mode is turned back to auto prior to starting or operating the BFVS tracks. Both the battery drain to discharge and the recommended work around make the BFVS NMC, IAW -10 PMCS tables. AMC is waiving the NMC requirement to have the system in auto sensing mode while in storage and not operated. If the sensor or battery fails when turned to auto, the vehicle will be reported NMC until repaired.

b. MWOs

(1) Each APS site will establish and maintain an MWO Coordinator to work directly with the ASC MWO coordinator.

(2) APS sites will update and verify the DA MMIS to provide a record and visibility of applied MWOs. Visibility of applied MWOs will also be maintained in ISR.

(3) For additional guidance on MWOs, see paragraph 6.4.

(4) Commodity Commands are responsible for MWO funding and will coordinate ordering and installation through the ASC MWO Coordinator.

c. Equipment disposition. APS equipment not site reparable or that exceeds the maintenance expenditure limits will be reported to the commodity command for appropriate disposition.

d. Specific Equipment

(1) Fuel Tankers (M978s, M967s, M969s).

(a) Cleaning and purging of fuel. The preferred method for purging is to use a solvent wash, and then a hot water rinse. Immediately after the hot water rinse, the tanker must be drained of all water and dried with hot air. Prior to any tank maintenance, a vapor reading of 0.0 is required with an explosimeter. ATP 4-43 contains guidance on how to safely vapor-free and clean mobile tanks used in the transportation of flammable liquids. TACOM Ground Precautionary Message, Control Number 94-02, Maintenance Advisory, provides proper guidance for purging fuel tankers using a biodegradable purging solution, NSN 7930-01-350-7034 or NSN 7930-01-350-7035.

(b) Inspection and testing for storage. All cargo tanks constructed in accordance with a DOT specification must be inspected and tested prior to storage unless received with documentation of certification within the past year. It is necessary to conduct these inspections and testing every maintenance cycle using registered and qualified people. Use of the Pneumatic Leakage Test Kit, NSN 2590-01-438-8806, will satisfy the leakage and pressure test requirements necessary to ensure a compliant tanker.

(2) Fire Extinguishers/compressed gas cylinders.

(a) Fixed cylinders integral to a weapon system. The DOT regulations identify how long these cylinders can go between hydrostatic retests. However, these test intervals only apply to cylinders that are being recharged. They do not apply to fully charged cylinders. Therefore, no fully charged and installed cylinder need be removed from a vehicle for hydrostatic retest, even if the retest interval has expired, unless it does not pass the visual inspection requirements detailed in the respective weapon system TM. If the retest interval has expired, and the cylinder has been completely or partially discharged, then the cylinder must be hydrostatic tested before the cylinder is recharged.

(b) Portable cylinders (e.g., hand held). The standard hydrostatic retest interval for compressed gas cylinders is every five (5) years. This applies to fully charged extinguishers, as well as those being prepared for

recharge. This is applicable to DOT 3A, 3AA, or 3AL cylinders containing carbon dioxide (CO_2) used in weapon systems. However, if the extinguishers contain dry powder, Halon, or a hydro fluorocarbon (HFC) agent, the hydrostatic test interval for these cylinders is only every twelve (12) years. Likewise, the hydrostatic retest interval for DOT 3A, 3AA, and 3AL cylinders containing chlorofluorocarbon (CFC) used in weapon system air conditioning or refrigeration systems is every five (5) years. Portable fire extinguisher must undergo hydrostatic retest when the retest interval expires.

(c) Disposable, portable fire extinguishers (such as the Halon 1301 handheld in weapons systems) are not subject to evacuation or recharge. The hydrostatic test interval is therefore equivalent to the service life of the extinguisher. These extinguishers shall be replaced at the intervals prescribed in the applicable technical manuals. All Halon 1301 handheld fire extinguishers removed from weapons systems due to visible damage or expiration of service life shall be turned in to the Army Ozone Depleting Substance (ODS) Reserve at the DLA Aviation following the DoD's turn-in procedure found at http://www.aviation.dla.mil/UserWeb/aviationengineering/OZONE.

(d) Hydrostatic retest must be performed by a DOT-certified retest facility. The CONUS facilities are certified through one of the DOT Independent Inspection Agencies. The OCONUS facilities are certified through the Defense Logistics Agency (DLA). The ODS Reserve staff at DCSR continues to provide training concerning the safe storage and handling of compressed gas cylinders and Halon system cylinders to personnel in DLA, the military services and other Federal agencies. A safety guide for the decommissioning of Halon fire extinguishing systems was initiated by the ODS Reserve and was prepared in coordination with the Environmental Protection Agency, Halon Recycling Corporation, Halon Alternatives Research Corporation, Fire Suppression Systems Association, and Halon system manufactures. The guide provides personnel involved in the decommissioning of Halon cylinders with identification and safe handling procedures for the commonly used cylinders. It is planned for this document to be periodically updated. Proper procedures are essential to the safe decommissioning of Halon systems. In order to describe the potential risks associated with decommissioning, to describe the Halon system configurations that might be encountered in the field or reclamation facilities, and to provide safe decommissioning guidelines, general, as well as specific procedures for properly handing and operating the major Halon bank operators, Halon recyclers, and Halon service professionals, are also provided. General, as well as specific, procedures for properly handing and operating the major Halon bank operators, Halon recyclers, and Halon service professionals are also provided. The guide is available electronically to the public on the web by accessing the Defense Environmental Network and Information Exchange (DENIX) at http://www.denix.osd.mil/, and retrieving the document, "Moving Towards a World Without Halon, Volume 2: Safety Guide for Decommissioning Halon Systems." ODS turn-in and requisitioning guidance is provided as Appendices B and C to this retrospective. For special concerns involving ODS turn-in and requisition guidance contact the Reserve Policy Office at (804) 279-5203/4525 or DSN 695-5203/4525.

(3) Fuel Filtration Additive Unit

(a) The U.S. Army has designed and fabricated a mobile system capable of cleaning hydrocarbon fuels and injecting additives where necessary. The system, designated the Fuel Filtration/Additive Unit (FFAU), is intended to refurbish fuel that is not otherwise usable and would normally be discarded. As such, the FFAU extends the effective SL of fuel, reduces disposal costs, and decreases the need to purchase new fuel.

(b) All APS, except AFSBn-CHS, fuel that is identified as "Not suitable for Use" shall be processed through the FFAU or a filter separator.

(4) Radioactive Material

(a) General

1. Control of radioactive material is mandated by Federal regulation. Immediately report any suspected lost, unaccounted for, stolen, or damaged items to your Radiation Safety Officer (RSO). If your Radiation Safety Officer cannot be reached, contact the commodity command radiation safety office listed in Appendix H.

WARNING

All personnel that operate and/or maintain fire control equipment that uses adhesives, cleaning solvents, and sealing compounds must be in a well-ventilated area away from open flame. Adhesives, cleaning solvents, and sealing compounds are harmful to skin and clothing and may give off harmful vapor.

2. Refer to appropriate level technical manuals for proper handling of radioactive commodities. Additionally, the NRC license or Army Radiation Authorization covering the commodity may prescribe

other handling requirements. Consult those documents for updated information. Copies of the NRC licenses and Army Radiation Authorizations may be obtained from the respective commodity command.

3. TB 43-0116, identifies radioactive items in the Army supply system together with the major end items of equipment and components in which these radioactive items are utilized. This TB is used as a guide in determining proper safety procedures for procurement, use, storage, maintenance, transfer, and disposal of radioactive items.

4. Radiation safety information to include commodity information, NRC licenses and regulations can be obtained by containing the respective NRC license holder or from the DA Radiation Safety Officer (RSO) web site maintained by CECOM. The DA RSO website (https://cecom.aep.army.mil/gstaff/DS_USER/RSO/default2.aspx) contains a library of information concerning the Army's Radiation Safety Program and should be accessed as needed with a Common Access Card (CAC).

5. AR 700-48 and DA Pam 700-48, contains guidance on dealing with radioactive commodity incidents. Additionally, see TB 9-1300-278 for Depleted Uranium (DU) incidents.

6. APS storage sites are required to be posted with “Caution Radioactive Material” signs. Additionally, Chemical Agent Defense Equipment storage areas are required to be posted with the following:

(i) Copies of the NRC license (all sites).

(ii) 10 CFR Part 19, 20, and 21 (unless a notice indicates where it can be reviewed)

(iii) Copy of NRC Form 3 (notice to employees) (CONUS sites only). A copy of the NRC Form 3 and other NRC publications may be obtained on the NRC web site at www.nrc.gov.

(iv) Copy of Section 206 of the Energy Reorganization Act (CONUS sites only).

(v) Radiation emergency points of contact (all sites).

(vi) No Smoking, Eating, Drinking, Chewing or Applying Cosmetics Indication.

(vii) Copy of SOP (unless posting indicates where to review).

NOTE

Posting of Caution signs is exempt in areas that the radiation level does not exceed 0.005 rem per hour at a distance of 30 centimeters from the surface of the source; e.g., chemical detector fall into this category and only require NRC postings.

(b) TACOM Radioactive Item Commodities. Please note that TACOM-RI has been relocated and combined with TACOM. Information under TACOM-RI and TACOM-warren shall be addressed by HQ, TACOM Safety Engineering Office.

1. The radioactive material used in artillery fire control devices is tritium gas (H3) sealed in glass vials. These sources illuminate the instrumentation for night operations. Federal regulation prohibits tampering with or removal of these sources in the field. In the event there is no illumination, broken/damaged or cracked, notify the installation RSO or TACOM RSO (DSN 786-7635/6194 or Commercial 586-282-7635/6194.

(i) Do not eat, drink, smoke, chew tobacco, gum, or apply cosmetics when working in areas where tritium devices are stored or maintained.

(ii) Identification: radioactive warning labels with the radiation symbol identify Instruments containing radioactive self-luminous dials. These labels shall be replaced, immediately, if found defaced or missing. Refer to the local RSO or the TACOM RSO for instructions on handling, storage, or disposal.

(iii) Storage: Spare equipment must be stored in the shipping container, as received, until installed onto the weapon. Storage of these items is recommended to be outdoor shed-type storage or unoccupied building.

(iv) Shipping: All radioactively illuminated instruments will be evacuated to the appropriate echelon for inspection and repair. Contaminated, non-illuminated instruments or broken/damaged (the exception being cracked without contamination) instruments will be turned over to the installation radiation safety officer for disposal as radioactive waste. Cracked, non-contaminated tritium items will be evacuated to the appropriate level in accordance with item manager disposition. Non-illuminated, non-contaminated instruments shall be evacuated to the appropriate echelon for inspection and repair.

(v) Emergency procedures: Contact installation RSO. If a device is damaged, if a source breaks, or is not illuminated:

1. Warn nearby personnel of the situation and have them evacuate the area.

2. If possible, ventilate the area to the outdoors. Do not ventilate to adjacent enclosed areas.

3. Do not handle broken tritium devices with your bare hands. Use gloves (if available) or grasp the item through a plastic bag turned inside out.

4. Quickly place item in a clear plastic bag and seal the bag with tape. Place this bag in a second clear plastic bag, seal with tape, and tag it indicating “Damaged – H-3”. Once the damaged device is contained in the plastic bags, place it on a bench top and leave the area.

5. Immediately wash your hands using nonabrasive soap and cool water to minimize the chance of tritium penetrating your skin after handling damaged or possibly contaminated tritium devices or if skin contact is made with any area contaminated with tritium.

6. Ensure that the TACOM RSO is notified. See Appendix H for appropriate point of contact.

7. For additional requirements and information, consult TB 43-0197 found online at https://www.logsa.army.mil/etms/index, as well as army radiation safety regulations and the DA RSO web site https://cecom.aep.army.mil/gstaff/DS_USER/RSO/default2.aspx.

2. Chemical defense equipment, like the M8A1 Chemical Agent Alarm System with the M43A1 Chemical Agent Detector, the Chemical Agent Monitor/Improved Chemical Agent Monitor (CAM/ICAM) and the GID-3/M22 Automatic Chemical Agent Alarm (ACADA), contain radioactive sources.

(i) In addition to posting requirements list above, the M43A1 Chemical Agent Detector, the CAM/ICAM, and ACADA must be leak tested if in storage for 10 years. Items not leak tested annually will be classified NMC. For further information regarding leak testing contact the TACOM listed in Appendix H.

(ii) If a chemical agent alarm detector or chemical agent monitor is damaged, don plastic gloves, place the item in a clear plastic bag, seal it and tag it indicating “Damaged – Am-241 or Ni-62”, as applicable. Immediately notify the RSO and the TACOM RSO licensee point of contact listed in Appendix H.

3. Radioactive commodities in the M1-series tanks as well as the Density Moisture Tester (DMT) used by engineer units. Commodities in the M1-series tank include depleted uranium heavy amour, engine combustor liner, and tritium muzzle reference sensor. Additionally, older vehicle gauges and dials contain Radium-226.

(i) Abrams Tank, Heavy (Depleted Uranium) Armor. This item contains radioactive material, Depleted Uranium (DU), which is NRC licensed by TACOM by NRC License SUB-1536. Chemical/Physical Form: Solid slabs sealed in stainless steel packages. The amount of DU in the armor is unlimited per the NRC License. It provides armor protection for the Abrams Tank. The Abrams Heavy Armor Tank can be identified by a turret number (serial number) ending in a "U". In addition, the turret may be distinguished from a non-DU turret by using a radiac meter. The tank is not otherwise marked with any radiation marking or symbol.

1. Storage and Handling: The DU in the Abrams Heavy Armor Tank requires no special handling procedures unless the armor is penetrated; see TB 9-1300-278, AR 700-48, DA Pam 700-48, and the Abrams Security Classification Guide

2. Shipping: Shipment of the Abrams Heavy Armor Tank is shipped as a non-radioactive shipment and as UN3166 (Vehicle, flammable liquid powered). The radioactive items on the tank must be listed in the shipping documents. For example,"UN2911 (Radioactive Material, Excepted Package-Instruments or Articles, 7 - Tritium Muzzle Reference Sensor) needs to be indicated in the shipping papers for the tanks with the Tritium MRS. UN 2909 (Radioactive Material, Excepted Package-Articles Manufactured from Natural or Depleted Uranium or Natural Thorium, 7 - for the DU Armor and Thorium Coated lenses)" needs to be listed for tanks with DU Armor and thorium coated lenses. Depending on the tank, you could have one or two entries in the shipping documents. Most tanks do not have the tritium MRS, so therefore you would only have the one entry of DU Armor and Thorium. Radioactive items are not considered a package unless they are shipped separately from the tank, in which case, the package would be shipped as a radioactive shipment using the UN number for the radioactive item. The tank is not considered a package, but as a vehicle with the radioactive items. The flammable fuel being the most hazardous, thus the shipment as UN3166.

3. Emergency procedures: Immediately contact the installation RSO or the TACOM RSO if the armor is penetrated or ruptured, then follow the requirements outlined in TB 9-1300-278, AR & DA Pam 700-48 and the Security Classification Guide.

4. TB 9-1300-278 and the Security Classification Guide for the Abrams Tank System, must be consulted for Abrams tanks with depleted uranium.

(ii) Abrams Tank Combustor Liner (NSN 2835-01-076-6092). This item contains radioactive material, thorium 232 (Th-232). The radioactive material is in magnesium metal. The amount of the radioactive material is 0.908 microcuries/lb. of alloy and the activity is .002 microcuries per gram. It provides a heat resistant liner for the engine of the M-1-series tank. TB 43-0216 and TB 43-0116 can identify the radioactive liner and TB 43-0216 provides information. Also, the liner containing thorium maybe distinguished from a liner without thorium by using a radiac meter and by its NSN. The non-radioactive liner's NSN is 2815-01-422-9131. The radioactive liner is not marked with any radiation marking or symbol.

1. Storage and Handling: It is prohibited to repair liner combustors or to treat/process them physically, chemically, or metallurgically. Replacement is allowed only if the old liner is turned in. Repair, condemnation or disposal is not authorized below depot/specialized activity level. Combustor liners will be disposed of in accordance with DA Pam 385–24. See TB 43-0216 for procedures.

2. Shipping: Shipment of the liner in the vehicle requires no special procedures. However, if the liner is removed, then shipment will be in accordance with 49 CFR and any other pertinent regulations.

3. Emergency procedures: See TB 43-0216 for emergency procedures and DA Pam 385-24. Immediately contact the installation RSO or the TACOM RSO in the event of loss or damage of the liner.

(iii) Vehicle Radium Dials/Gauges containing Radium 226 (Ra-226) may be on vehicles built prior to 1970. The chemical form is Radium 226 Sulfate while the physical form is Radium 226 luminous paint solid. The radium is on the dial/gauge numbers or indicators inside of a glass covered instrument. However, some vehicles may have radium dials/gauges which are not marked with any symbols, and are not listed in the TBs. One can use TB 43-0216 or TB 43-0116 or a radiac meter to identify the radioactive dials/gauges. Additionally, gauges with a model number ending in –1 most likely contain radium. The above shall be used together to identify if vehicles contain radium dials/gauges. Some vehicles may not be listed in the TBs and have the radium dials/gauges. The dials/gauges are not marked with any radiation marking or symbol.

1. Storage and Handling: Storage of the vehicles containing the radioactive dials/gauges does not require any special procedures. However, the dials/gauges must be intact with the glass covering the face of the instrument intact. Otherwise, see the procedures in TB 43-0216 and contact the TACOM Safety Engineering Office for other Requirements. Follow TB 43-0216 if the dials/gauges are separated from the vehicles.

2. Shipping: Shipment of a vehicle with an intact radium dial/gauge requires no special procedures. Follow TB 43-0216 and contact the TACOM Safety Engineering Office if the dials/gauges are removed. Radiation and contamination surveys in accordance with DOT regulations are required for shipments of radium dials/gauges removed from vehicles, and of the vehicles themselves, to verify there is no contamination. Shipping documents must identify the radium dials/gauges and have a certification statement. Persons certifying the shipment must be trained in accordance with 49 CFR Part 172, Subpart H, training and DTR 4500.9-R, Part II (cargo Movement).

3. Emergency procedures: Dials and gauges which have been damaged or which have had the glass shattered shall be removed from the vehicle and disposed of in accordance with DA Pam 385–24 and TB 43-0216. Notify the local RSO in the event broken dials or gauges are found.

(iv) Density Moisture Tester (NSN 6635-01-604-1875). This item contains radioactive material, Cesium 137 (Cs-137) 0.30 GBq (8 millicuries [mCi]) and Americium 241 (Am-241) 1.48 GBq (40 mCi). The radioactive material is in special form with the Cs-137 in ceramic and the Am-241 in ceramic with beryllium oxide. They are doubly encapsulated in stainless steel. They provide the density and moisture counts for soil being tested for determination of compaction requirements, which leads to roadway and runway construction. Federal regulation prohibits tampering with or removal of the sources.

1. Safety precautions: Radiation dosimeters are required for personnel entering the tester storage area or when handling the tester. Do not eat, drink, smoke, chew tobacco or gum or apply cosmetics when working in areas where the tester is handled or maintained. The DMT is identified by radioactive warning labels with the radiation symbol and will have two DOT Yellow II Labels on the DOT-7A transport box containing the tester. These labels will not be defaced or removed and shall be replaced immediately.

2. Storage and handling of the tester will be in accordance with TM 5-6635-350-13&P and NRC license 21-32838-02. Radiation surveys are required semiannually for all tester storage sites. See DA RSO web site for updated information.

3. Leak Testing: The DMT tester requires a leak test of the radioactive source annually. This applies to testers in storage as well as items in an operational status. For further information on leak testing contact, the TACOM RSO listed in Appendix H.

4. Shipping: Retain the original Type A DOT-7A container, packaging and foam pack received. The tester shall be in its type A DOT-7A package, which is padlocked. If a fiberboard over pack is used, the words "Type A DOT 7A Container Within" shall be placed of the over pack with all other required markings. Two Yellow II labels and a Cargo Aircraft Only label (if applicable) must be on the tester package. Labels must not be on the top or bottom of the tester package. The labels require a radiation reading called Transport Index. The package needs to be marked "Export" if applicable. Package marking needs to be: "UN 3332, Radioactive Material, Type A Package, Special Form, 7 (markings shall be at least 1/2 inch in height), name & address of owning organization". Only one tester may be shipped per package. Radiation and contamination survey is required prior to shipment. Vehicle placarding is not required. Only Cargo aircraft shipment is authorized. Shipping documents require certification in accordance with 49 CFR and IAEA (export), to include a description of the tester and its sources, and a 24 hour emergency response phone number.

5. Notify the DMT Tester Item Manager and receiving organization within 24 hours upon tester shipment.

6. Emergency procedures: Immediately contact the installation RSO or the TACOM RSO. See tester TM 5-6635-350-13&P for emergency procedures in handling damaged, leaking, or lost/stolen testers. Also, see the TM for procedures for personnel over exposure.

WARNING

Damaged DMT testers may create a hazardous condition due to elevated radiation levels. In the event that a DMT tester is damaged, move away from the item and warn others to stay at least 25-50 meters away until emergency personnel secure the area.

TB 43-0216, Safety and Hazard Warnings for Operation and Maintenance of TACOM Equipment, covers vehicle radium dials/gauges, Abrams tank combustor liner and the DMT soil density tester. In addition, for the tester TM 5-6635-350-13&P, Operator and Field Maintenance Manual (Including Repair Parts and Special Tools List) for Density Moisture Tester (NSN 6635-01-604-1875), shall be consulted.

(c) CECOM Radioactive Commodities.

1. CECOM manages thermal optics, some of which contain small amounts of radioactive thorium. These items are covered by a NRC license held by CECOM.

2. Handling precautions include the following: Care shall be taken in the handling of these optical components to avoid inhalation and/or ingestion of any dust or flakes from lens that has been inadvertently chipped or scratched. Immediate first aid shall be given to anyone receiving a cut caused by broken and/or chipped thorium fluoride (ThF4) coated lenses. Prompt cleansing of the wound to minimize entrance of thorium particles into the body is essential and the RSO must be notified at once. Wearing gloves to handle lenses provides protection from contaminated dust on chipped or broken thermal lenses. DO NOT vacuum, sweep, or use high-pressure air to clear ThF4 from the work area. Carefully clean or gently blot the surface to remove chipped particles. Maintenance personnel shall wash their hands with mild soap and water after handling the thermal lens or window.

3. Consult the appropriate TM for additional guidance and to determine the level of authorized maintenance. Notify the NRC license holder of damaged, stolen or missing thorium optics.

4. The TACOM-Unique Logistics Support Applications (TULSA) website (https://tulsa.tacom.army.mil/demil/demilmain.cfm) provides basic disposition instructions and summarizes the requirements for the safe handling, disassembly and removal of radioactive components contained in Army managed radioactive commodities.

(d) JMC Commodities – Depleted Uranium (DU) Ammunition.

1. There are several models of ammunition that contain a depleted uranium (DU) penetrator. All models fall into federal supply classes 1305-1315. Information on model numbers, department of defense identification codes (DODIC), and national stock numbers can be obtained from the Munitions History Program or the IRS.

2. This ammunition, while in APS, is to be handled in accordance with a standard ammunition and explosive guidance and precautions.

3. Although the primary hazard of DU ammunition is the explosive hazard of the propellant, radiation safety officers (RSO) must post storage locations with Caution Radioactive Material signs. Other requirements for the storage and handling of DU ammunition can be found in Nuclear Regulatory Commission license number SUC-1380 and by contacting the JMC RSO. DU ammunition storage facilities at land-based APS sites require annual radiation surveys. Consult the local RSO or the licensee listed in Appendix H for further information.

4. TB 9-1300-278 must be consulted for guidance in dealing with accident and incidence involving depleted uranium ammunition.

(e) MCOM Commodities: For AMCOM Commodities contact the Radiation Safety POC in appendix H.

SECTION III PETROLEUM, OILS, LUBRICANTS (POL) SAMPLING

3.3 SAMPLING OF SUPPLY CLASS III PETROLEUM OILS LUBRICANTS (POL)

a. Class III quality surveillance of APS includes the actions required to monitor and maintain liquid fuels, packaged petroleum, and chemical specialty products. Product deterioration could cause such problems as filter plugging, nozzle sticking/fouling, transfer pump plugging, microbiological growth, fuel starvation, corrosion of fuel-wetted surfaces and could seriously affect operational readiness of prepositioned rolling stock. This plan is intended to ensure that Class III products are properly monitored and maintained in a state of combat readiness.

b. This plan provides general guidance for implementing Army prepositioned petroleum quality surveillance (Q/S) procedures for liquid fuels, packaged petroleum, and chemical specialty products.

c. Responsibilities for APS Petroleum Quality Surveillance are as follows:

(1) AMC is responsible for ensuring an adequate Class III quality surveillance program is maintained within the Command.

(2) ASC, AFSBs are responsible for :

(a) Coordinating implementation of the quality surveillance program and monitoring contract compliance.

(b) Providing guidance to contract personnel on corrective action for off-specification product.

(c) Conducting Class III sampling in accordance with guidance contained herein.

(d) Submission of Class III samples for analysis to a USAPC designated testing site.

(e) Performing remedial action on equipment containing off-specification product as directed by ASC.

(f) Monitoring SL management of package petroleum products for all land based APS.

(g) Containerization and shipment of expired or off-specification Class III (P) items.

(3) U.S. Army Petroleum Center (USAPC) is responsible for:

(a) Monitoring analysis results of Supply Class III products submitted.

(b) Providing test results and disposition guidance to ASC, APS Sites and designated Government activities.

(c) Providing training and technical assistance on matters relating to the quality Supply Class III surveillance program.

(d) Providing recommended action to the responsible engineering support activity on changes to Supply Class III (P) military performance specifications which affect usability of APS stocks.

(4) Wholesale Stock Operations Branch under Supply Chain Operations Directorate (SCOD) is responsible for:

(a) Asset Management of Wholesale Supply Class III (P) war reserve stocks (excluding fuel in tankers).

(b) Coordinating action to upgrade Supply Class III (P) items with updated military performance specification requirements for all prepositioned package petroleum products.

(c) Coordinating Supply Class III (P) sampling schedules.

(d) Coordinating movement of Supply Class Ill (P) to APS storage and for disposition when moved from APS storage due to off-specification condition.

d. Safety

(1) Sampling-Personnel responsible for sampling must ensure safety precautions are observed to prevent accidents or possible injury. The following safety precautions shall be followed when sampling petroleum products:

(a) No Smoking-Strictly enforce NO SMOKING rules.

(b) Fuel vapors- Avoid exposure to fuel vapors for long periods.

(c) Bonding-Ensure rope on weighted beakers remains in contact with the edge of the manhole cover or gage hatch when lowering or raising the sampler.

(d) Nylon clothing-Never wear nylon clothing when sampling or handling petroleum products.

(e) Protective clothing-Wear leather or rubber gloves.

(f) Fire extinguishers-Ensure fire extinguishers are within easy reach but where they will be safe from a fire.

(2) Spill prevention and countermeasures must comply with AR 200-1 to ensure safety protect the environment, and comply with all required Federal, State, and local laws and regulations. Those include, but are not limited to, the Clean Water Act (CWA), Coastal Zone Management Act (CZMA), and Safe Drinking Water Act (SDWA). The following spill prevention and countermeasures shall be followed when sampling and handling petroleum products:

(a) Fill sample containers carefully and avoid overfilling.

(b) Ensure spill clean-up materials are on hand and that personnel are familiar with their use.

(c) Ensure personnel are familiar with the installation Spill prevention control and countermeasures plan (SPCCP) and know the proper procedures for reacting to fuel spills.

e. Fuel sampling requirements. Fuel sample will be performed in accordance with this section and ANSI/ASQ Z1.4 & Z1.9 , ASTM-D4057, ATP 4-43, TM 4-43.31,MIL-STD-3004, Part 1 (Bulk), and MIL-STD-3004, Part 2 (Packaged).

(1) General-Liquid fuel samples taken from rolling stock provide critical information on the operational readiness of equipment. Personnel responsible for sampling must ensure procedures detailed in this document are followed so that valid test results can be obtained.

(2) Equipment American Petroleum Institute (API) gravity screening-All equipment identified for upload must be screened for API Gravity. Fuel tanks/cells on equipment failing the screening test shall be drained and replaced with JP 8. Refer to Appendix C for API gravity screening procedures.

(3) Fuel cleanliness-Equipment fuel tanks/ cells must be clean before being loaded aboard APS vessels to help ensure operational readiness. Visual sediment or water observed shall be removed through filtration before upload (see Para 3-2d(3)). The Fuel Filtration/Additive Unit (FAU) will be used to remove sludge, deposits, water bottoms, and microbiological debris from fuel tank environments. Tracked vehicles downloaded from APS-3 vessels will have the fuel run through FAU.

(4) Land based APS sampling scheduling:

(a) Equipment sampling shall be performed during the COSIS exercise required in Chapter 6, Section III. Frequency of sampling, however, will be performed in accordance with Table 3-1. Refer to either Table 3-1 or 3-4 to determine the type of sample required.

(b) Sampling of fixed storage tanks used to refuel rolling stock will be performed every 2 years. Refer to Table 3-1 for sampling requirements.

Table 3-1. Fuel Sampling and Testing Requirements

Location of Fuel	Type of Storage	When Sampled	Type of Sample	Type of Test Required (MIL-STD-3004)
Defense fuel	Bulk	(a) Before	All levels	A
support point	storage	APS-3 cycle		
or preposition	tank	prior to issue into		
Site		refueling vehicles		
		(b) 24 months		B-2
		(prepo site only)		
Preposition	Petroleum		All level	A
Site	tank vehicle			
	bulk storage			
	compartment			
Preposition	Tactical	24 months for land-based	Bottom	B-2*
Site	vehicle or		sample	
	generator			
	fuel tank			
Preposition	Combat	24 months for land-based	Bottom sample,	B-2*
Site	tracked		smoke generator	
	vehicle		inlet	B-2*

Legend

Type “A” Test: Complete specification inspections tests.
Type “B” Test: Partial analysis to verify characteristics susceptible to deterioration because of age and determine adequate quality for equipment function. Listed below re the specification requirements for ground mobility fuel in APS rolling stock.

Gravity, API @ 60º F, Min	37.0
Appearance, Visual	Report
Color, Visual	Report
Water Content % Vol., Visual	None
Fuel System Icing Inhibitor, vol. %	0.05-0.20
Distillation: ºC IBP	Report
10% Rec, Max	205
50% Rec,	Report
90% Rec	338
Final Boiling Point	370
% Reside	3.0
Flash Point, ºC, Min	38
Cloud Point, ºC, Min	-15
Particulate Matter, mg/L, Max	10

* - Indicates specification-testing requirements modified on fuel used for ground mobility purposes only.

Table 3-2. Petroleum Sampling Log

SAMPLE NUMBER	DATE SAMPLED	SAMPLED BY	SAMPLE SOURCE	TYPE OF SAMPLE	RESULTS	REMARKS
96-001	15 Apr 2014	Mr. Smith	M-1, D10359 Left/Rear	Smoke Gen	OG	
96-002	15 Apr 2015	Mr. Jones	M-113,22502MU Rear/Right	Bottom	NSFU	R/R fuel tank Cleaned and Resampled #96-029
96-054	15 Oct 2016	Mr. Smith	USAU0642886	3 QTs	SFU	NSN 9150-01-433-7970, MIL-PRF-2104 LOT P-2100

RESULTS – OG 9ON GRADE0, SFU (SUITABLE FOR USE), NSFU (NOT SUITABLE FOR USE)

(5) DD Form 2927 (Petroleum and Lubricants Sample Identification Tags) must be completed for each sample taken and shall be attached to the sample container. Sample tags must be filled out completely to ensure proper laboratory testing and documentation.

NOTE

Submitting activities shall ensure that the sample tag is as complete as possible, including a complete mailing address the first time. An activity code will be provided to the submitting activity based on the address provided. Samples sent after the initial submission shall thereafter indicate the activity code in the FROM block along with the organization title and vessel name. Refer to TM 4-43.31 for further guidance on completing the Petroleum Sample Tag.

Table 3-3. Equipment Classification and Sampling Level

Equipment Category	Sampling Level
Wheeled vehicles under 2½ ton and over generators	S-3
Wheeled vehicles 2½ ton and over, material handling equipment	S-3
Petroleum tank vehicles containing bulk fuel and fixed bulk storage tanks	G-1
M1 tanks, M88 recovery vehicles, Bradley, APCs, M109A6, M992	G-1
All other tracked vehicles	S-3

Calculating number of samples of each equipment category.
Step 1- Categorize all equipment from data obtained in the ISR inventory report.
Step 2- Calculate total for each equipment category.

Table 3-4. Sample Quantities by Equipment Category

Equipment Total Category	Number of Samples by in S-3 Level*	Number of Samples in G-1 Level*
2	TO 8	3
9	TO 15	3
16	TO 25	3
26	TO 50	3
51	TO 90	5
91	TO 150	5
151	TO 280	13
281	TO 500	13

Step 1 - Locate appropriate range in "Equipment Total by Category" column that applies to figure obtained in Step 2.
Step 2 - Read across from the range obtained in Step 3 and match the sample level in Table 3-4 to the sampling level.
*Note: S-3 and G-1 levels are extracted from ANSI/ASQ Z 1.4. The number of samples are calculated from (the or a) Single Sampling Plan for Normal Inspection using an AQL of 4.0.

Table 3-5. Type of Sample for Tracked Vehicles

Type of Vehicle	Location of Fuel Cell	Type of Sample
M1	Left or right front	Bottom
M1	Left rear	Smoke generator pump outlet
Bradley	Lower	Before fuel filter unit
M109A6/M992	Left	Bottom
M113	Left or right rear	Bottom

(6) Sample Log-A log must be maintained to record each sample taken. The Petroleum Sample Log assists personnel in tracking fuel quality to the sample source (i.e., storage tank, vehicle, package product lot/batch). Table 3-2 shows an example for completing the sample log.

(7) Shipping-Samples taken under the APS petroleum quality surveillance program are considered hazardous material and must be shipped in accordance with international and Federal regulations. Only UN/1A1 approved containers of the type identified in Appendix C shall be used to ship fuel samples. Sampling activities shall contact their installation shipping office for instructions on required packaging and marking of containers for package products since requirements vary depending on the type of item. Samples shall be mailed to the USAPC or a laboratory designated by the USAPC.

f. Supply Class III (P) SL Requirements.

(1) SL Types – Supply Class III (P) items are classified as either Type I or Type II. Product SL information for any item can be obtained from the FEDLOG under the column heading of Shelf-Life Code (SLC).

(a) Type I items are identified with an alpha character. Once the SL has been reached, the product is turned in for disposal. Item TM 38-470 identified with a numeric character under the SLC column are Type II items. Type II items have a limited SL as identified by the SLC number; however, they can be extended through visual or laboratory testing.

(2) SL limits - Maximum limits for SL of Supply Class III (P), Type II items, have been set to provide assurances that the products will perform as required, minimize costs associated with rotating stock, and reduce hazardous material disposal costs.

(a) Land Based Management

1. Product age is not to exceed 5 years from date of manufacture when initially stored. Items received into storage shall be in condition code A regardless of SL remaining.

2. Product age shall not exceed 10 years from date of manufacture.

3. SL management shall be performed IAW AR 710-2, App C and DA PAM 710-2-1, Chap 12.

(b) Afloat Managed (APS-3)

1. Class III (P), Type II will be issued out of Defense Logistics Agency (DLA) or on contract via Direct Vendor Delivery (DVD) as directed by ASC; Minimum Time Track (MTT**)** for each scheduled vessel upload.

2. SL stocks received at site shall be physically inspected to ensure stocks are not damaged, have all the proper shelf-life markings on the package, and ensure the manufacturer's expiration date has not expired. If SL stocks are damaged and have packaging discrepancies, the site will submit a Supply Discrepancy Report (SDR) to Source of Supply (SOS). An SDR will be submitted for stocks valued only in excess of $100 (DLM 4000.25, Volume 2, Supply, Chapter 17 - Supply Discrepancy Reporting). If value is not in excess of $100, AFSBn-Charleston will contact Army Sustainment Command (ASC) to have Service Item Control Team (SICT) / MSCs reorder stocks to fill shortage.

3. Type I Non-extendible stocks: AFSBn-Charleston will contact ASC (APS Secondary Items Team) to obtain a waiver through AMC prior to loading any Type I shelf-life stocks which has a shelf-life of less than 36-months. For example, Battery (Hawker), NSN 6140-01-485-1472, SLC-P (30-month) non-extendible SL.

4. Type II extendible SL stocks: Once Type II SL stocks are receipted at AFSBn-Charleston a sample of each NSN batch/lot of all Supply Class III (P) Type II extendible SL items will be secured per Chapter 3 (Fuel Sampling), Appendix D and AFSBn-Charleston will start sending samples to Combat Capabilities Development Command (CCDC) Ground Vehicle Systems Center (GVSC) 6-months prior to stocks expiration date (Sampling submission procedures and APL shipping address provided in paragraph 3.3.f 4 i, and 3.3.f 4 ii below).

(i) CL III (P) Sample Submission Procedures

1. CCDC GVSC requires one (1) Gallon per batch/lot. (Example: UI = QT, send Qty 4).
2. CL III (P) will be packaged in boxes with proper markings, use up-arrows on liquid packages, provide shipping activity and ship-to address identified in 4ii below.
3. DD1222 form (Request for and Results of test) must accompany each product.
4. CONUS organizations must include Activity Code. Example: AFSBn-Charleston is S40.
5. For stocks that have exceeded their inspection test limit, 1. CCDC GVSC has provided guidance in writing that grants approval for the site to submit test samples that have exceeded their inspection test limit.

(ii) Shipping address for US Army CCDC GVSC Petroleum Laboratory (APL):

US Army CCDC GVSC Petroleum Laboratory
ATTN, RDTA-SIE_ES_PFT-APL
Blgd. 85-3, U Avenue
New Cumberland, PA 17070-5008
(717) 770-6886

5. In the event a lot/batch on-board an APS-3 vessel has not been extended due to failure during inspection process, and stocks will expire during the deployment, AFSBn-Charleston will request the US Army CCDC GVSC Petroleum Laboratory to conduct another sample and test that lot/batch 6-months prior to expiration. If batch/lot cannot be extended, the SL stocks will remain onboard the vessel throughout its deployment cycle, then will be disposed of in accordance with DoDM 4140.27, SL Management Manual, Chapters 6 (Material Disposition). Visual or laboratory inspections are not possible on deployed vessels in APS-3 due to the non-accessibility of the containers.

6. Upon completion of each APS-3 deployment cycle, the site will be required to provide Army Sustainment Command (ASC) a list of those SL stocks that have been downloaded from the vessel. Determination will be coordinated between ASC/ AFSBn-Charleston personnel to which stocks can be reutilized for future operations. Type II non-expired SL stocks not meeting future APS-3 operational schedules will be disposed of through the local DLA Disposition Services (IAW local procedures) or returned to DLA Aviation for reutilization. Expired SL stocks will be disposed of through Joint Base Charleston, and then transported to a waste management facility using Waste Management Transfer Document (DoD form 5090-8) for chain of custody transfer. Disposal actions will be conducted in accordance with state and local environmental laws (DoDM 4140.27 Volume II).

SECTION IV CYCLIC MAINTENANCE

3.4 OVERVIEW

a. All maintenance significant equipment will be scheduled through maintenance in a cyclic basis.

b. APS site commanders will program the annual workloads for each APS Site of vessels, as appropriate.

c. Equipment on LMSR and container ships will be scheduled for maintenance every 36 months and 24-30 months, respectively. Deviations from this maintenance cycle must be granted by HQDA. Watercraft forward stored will be scheduled for on condition cyclic maintenance (OCCM) every 4 years for the barge derricks (BD), 5 years for wet stored vessels, and 6 years for dry stored vessels.

d. Cyclic maintenance schedules for tactical and combat equipment.

(1) Tactical equipment:

(a) Equipment in indoor storage will be scheduled for maintenance every 48 months.

(b) Equipment not stored indoors will be scheduled for maintenance every 24 months.

(c) Equipment stored indoors and subsequently moved to open storage will revert to a 24 month maintenance cycle once the equipment has been in open storage more than 30 consecutive days.

(d) Equipment in open storage and subsequently moved to indoor storage will revert to a 48 month maintenance cycle after the next 24 month scheduled maintenance is completed. If the 24 month scheduled maintenance has been completed within 30 days before the equipment movement to indoor storage, then the 48 month maintenance schedule begins at the time of last completed maintenance.

(2) Combat equipment:

(a) Equipment in a CH environment will be scheduled for limited maintenance/PMCS every 48 months.

(b) Storage of equipment in open storage must be approved by ASC.

(c) Equipment in open storage will be scheduled for maintenance every 24 months and PMCS/exercised every 18 months.

(d) Equipment stored in a CH environment and subsequently moved to open storage will revert to a 24 month maintenance cycle and PMCS/exercised every 18 months once the equipment has been in open storage more than 30 consecutive days.

(e) Equipment in open storage and subsequently moved to a CH environment will revert to a 48 month limited maintenance/PMCS cycle after the next 24 month scheduled maintenance is completed. If the 24 month scheduled maintenance has been completed within 30 days before the equipment movement to a CH environment, then the 48 month maintenance schedule begins at the time of the last completed maintenance.

e. At the end of each cycle all field level maintenance, exercising, and PMCS will be accomplished with the following exceptions:

(1) For stored Combat Equipment, if equipment meets all of the following criteria:

(a) Equipment had al PMCS maintenance completed at time equipment was put into storage.

(b) Equipment is IAW AR 750-1, paragraph 3-2.

(c) Equipment is stored in a Controlled Humidity Environment with the RH maintained between 30-50%.

(d) Equipment has not been removed from CH storage during the cycle.

(e) AOAP sampling is accomplished every cycle in accordance with DA or OEM requirements.

(f) Every cycle the engine health check is accomplished as specified in the TMs and vehicles are exercised (road tested).

(2) Combat Track vehicles and trailers will only have wheel service performed when any one of the following conditions exist:

(a) Semi-annual

1. Inspect for metal fragments on the chip detectors (M1 unique).

2. Clean engine compartment.

3. Inspect, clean, and service the air induction system.

4. Inspect the Hull Networks Box for cracks, brakes, missing hardware, and loose electrical cables (M1 unique).

5. Operate Drivers Night Vision Viewer.

6. Ground check hop power

7. Inspect track assembly for conformance to condition code in accordance with applicable vehicle TM.

8. Service Main Gun Elevation Mechanism Disk Filter (M1 unique).

9. Replace hydraulic fluid filters.

10. Inspect and clean crosswind sensor (M1 unique).

11. Inspect Breech Ring Contact Group.

12. Check Smoke Grenade Launchers.

(b) Annual

1. Inspect and replace, as necessary, plenum-to-engine seal, engine air inlet screen and adhesive (M1 unique).

2. Inspect Engine Oil Filter Element.

3. Replace Personnel Heater Fuel Water Separator Filter, (if equipped).

4. Inspect sprockets and road wheels for wear.

5. Inspect stowage shelves and projectile racks (M992 unique).

(3) Tactical wheeled vehicles and trailers will only have wheel service performed when any one of the following conditions exist:

(a) Visual inspection of wheels indicates seepage around inner seal.

(b) Wheel service is required due to application of SOUM or MWO.

(c) Evidence indicates contamination of gear hub oil.

(d) Vehicle or trailer has been removed from controlled humidity storage and used in an exercise or contingency.

(e) Vehicle or trailer has more than 500 miles since the last service.

(f) If any of the mileage is at high speed or off road.

f. Physical inventories will be conducted, property records reconciled, excess equipment turned in, and issue of new equipment accomplished.

g. Other equipment requiring maintenance effort, but not belonging to a scheduled unit set, will be integrated into the fiscal year (FY) maintenance program but referred to a non-cyclic maintenance (NCM).

h. All medical items are maintained by medical logistics personnel and are reconstituted every 5- years or after use. At this time, all non-hospital assemblages will be upgraded to the most recent UAL. Combat Support Hospitals will be reconstituted every 30 months and will receive any ship-short packages due out. Combat Support Hospitals will be reconstituted/upgraded per established fielding schedules or every 5 years, whichever occurs first.

i. All material will be inspected to assure serviceability (PMCS) requirements of item TM -10/-23 or -24 maintenance requirements are met. Additionally, tires will be inspected for serviceability during cyclic maintenance.

j. Maintenance operations for ammunition and munitions will be performed per the prepositioned (PREPO) Maintenance Cycle Surveillance Inspection Plan. Technical assistance for this plan is Army Sustainment Command, Director, Sustainment Operations and APS Directorate, ATTN: AMSAS-SPA-A, 1 Rock Island Arsenal, Rock Island, IL, 61299-6500. For PREPO assistance, call (309) 782- x1199, x0947, or x1697. A statement of work for inspection/maintenance of missiles will be prepared by HQ AMCOM and approved by HQ AMC. Periodic inspection and maintenance will be performed during the maintenance cycle. If maintenance is not conducted at the port facility or land-based site, these items will be loaded directly on railcars or trucks for shipment to AMC depots for maintenance. These items may be returned via rail or highway in time for reloading of the ship or replaced.

k. Operational projects and sustainment equipment requiring maintenance will be integrated into the fiscal year (FY) maintenance program.

l. Materiel shall be checked for deterioration per Table 3-5.

Table 3-6. Inspection Frequency of Supply Class IX Materiel Without Specific SL Assigned

Type	Inspection
Storage	**Frequency**
Controlled Humidity	60 months
Containers	30 months
Open deck	12 months

This requirement shall be performed during cyclic maintenance and time of issue

m. During maintenance cycles, SL materiel shall be monitored to ensure materiel does not degrade to an unusable level. The following shall be used to identify appropriate condition code changes, if the item is approaching or has passed its next test date:

n. Chemical or radioactive equipment and materials shall be inspected in accordance with SB 740-94, SB 3-30-2 and equipment manuals.

o. Vehicles equipped with thermal imaging systems will power up the thermal unit and time the cool down. If cool down is not attained in 15 minutes, (a cool down light will come on once cool down is completed), a DA Form 2407 shall be submitted to maintenance indicating thermal system failure.

p. During maintenance cycles, if equipment must be stored on terrain without adequate drainage, some means will be provided to improve the surface. If unable to improve the surface, refer to TM 38-400 for applications to prevent the equipment from settling into the soil (landing mats, planks, stone, gravel fill, etc.).

q. All sulfuric acid electrolyte (in one gallon plastic bottles) needed to fill dry batteries for operational projects, ground support equipment, or that has not been previously identified will be swapped out during every maintenance cycle. No replacement sulfuric acid containers will be loaded aboard the vessel if, before the next maintenance cycle, the packaging could become more than 5 years old from the date of manufacture. SL extendable batteries shall be inspected in accordance with SB 11-6.

r. Dry lead-acid batteries with sulfuric acid electrolyte will be exchanged for new batteries every maintenance cycle.

s. Replacement of extractor parts for the M249 machine gun are not required if it was not fired within the previous three years as per TM 9-1005-201-23&P.

t. RFID tag lithium batteries will be replaced when interrogator indicates low battery.

SECTION V MAINTENANCE FUNCTIONS FOR WATERCRAFT

3.5 FUNCTIONS

a. Watercraft requires testing, sea trial, marine condition survey, and dry-docking where practicable. All watercraft and other end-items will be repaired using Army Field Level maintenance standards IAW AR 750-1, paragraph 3-2. Exercising will be accomplished during this maintenance period.

b. Maintenance: Watercraft maintenance is split into four separate entities: Preservation; Care of Supplies in Storage (COSIS) Maintenance; Field and limited Sustainment level Maintenance; and, OCCM (On Condition Cyclic Maintenance)/Sustainment.

(1) Preservation (following maintenance, exercise, or contingency): APS watercrafts are stored in a preserved state. Tasks include such items as: empty and clean all tanks, dry all pipe work, close and seal all inlets to the craft, install dehumidification equipment, etc.

(2) Care of Supplies in Storage (COSIS): Primarily comprehensive corrosion control, RH control, emergency repairs, shaft rotation, regular inspection of watertight integrity, moorings, cradles, and access.

(3) Quarterly/Annual maintenance: All vessels have equipment operated quarterly. Engines are started and brought to normal operating temperatures, electrical equipment is tested, piping systems checked, steering gear turned, etc. Annual maintenance includes a sea trial for a minimum of 4 hours. Each vessel is moved under their own power away from the pier for full testing. Annual requirements include a 100% inventory and inspection of all items to include BII, COEI, OBSL, and safety equipment.

(4) Field and Limited Sustainment: Maintenance executed primarily to repair faults found during quarterly/annual maintenance. This maintenance is intended to keep the vessels at Army Field Level Maintenance standards and includes limited maintenance that may fall between Field Level and Sustainment level repairs.

(5) On Condition Cyclic Maintenance (OCCM)/Sustainment: Maintenance beyond the capability of the site. This maintenance is primarily dry-dock, underwater hull survey and subsequent repairs and inspection to ensure compliance with Army, Code of Federal Regulations (CFR), international, and Safety of Life at Sea (SOLAS) standards. The OCCM for APS Landing Craft Utility (LCU) is 4 years and OCCM for APS Small Tug (ST), Modular Warping Tug (MWT), and Causeway Ferry (CF) is 6 years.

c. Maintenance functions to be performed by the gaining unit during issue include:

(1) Upload ISR maintenance and historical data.

(2) Assist with fueling and de-preservation, if not completed prior to arrival.

(3) Conduct dock trials

(a) Pre-operational checks (all services will be up to date)

(b) Test of all operational systems.

(c) Pre-sail and safety checks.

(4) Conduct sea trials

CHAPTER 4
QUALITY ASSURANCE

SECTION I POLICY

4.1 GENERAL

a. This chapter addresses Quality Assurance (QA) and Quality Control (QC) requirements for APS storage and maintenance operations.

(1) Quality Assurance (QA). The process that provides oversight of an organization's quality control processes to assure their effectiveness in the production and delivery of quality products and services. QA will be performed in accordance with the following: In-house work - QA will be performed by the site managers; Contractor work - QA will be performed by the responsible COR/ACOR, or their representatives.

(2) Quality Control (QC). The processes used to assure performance meets agreed upon customer requirements which are consistent with law, regulations, policies, sound technical criteria, schedules, and budget. QC will be performed by the organization executing the work, i.e., the division/office or contractor working for the organization, with oversight by site commander.

b. Each APS site will train and have identifiable QA and QC programs in accordance with Army regulation and contractual requirements. Each APS site shall establish, implement, and maintain a quality management system (QMS) in compliance with the requirements of Army Regulation 702-11, Army Quality Program. Government personnel shall retain ownership of the QMS.

c. A QA element at each APS site will be designated as having responsibility and authority for ensuring that processes needed for the QMS are implemented, maintained and continually improved. Continuous improvement processes within the QMS shall be supported by the application of Lean/Six Sigma techniques. The QA element shall routinely report to top management on the performance of the QMS and any need for improvement.

d. A QA element at each APS site will be designated as having responsibility and authority for ensuring that processes needed for the QMS are implemented, maintained and continually improved. Continuous improvement processes within the QMS shall be supported by the application of Lean/Six Sigma techniques. The QA element shall routinely report to top management on the performance of the QMS and any need for improvement.

e. APS sites with contractor supported operations shall ensure compliance with the QMS. Contractor support of QMS development, maintenance and improvement will be specified in the contract.

SECTION II PROCESS PROOFING

4.2 PURPOSE

a. The purpose of process proofing is to;

(1) Ensure a process enables products to be produced which consistently conforms to prescribed specifications.

(2) Identify opportunities for process improvements.

(3) Provide an opportunity for early identification of problems.

(4) Instill confidence amongst those involved utilizing the process.

4.3 REQUIREMENTS

a. Prior to normal cyclic maintenance activities, or prior to repair activities not associated with cyclic inspections, and at least annually, QA personnel will;

(1) Proof the adequacy of the site operator's processes in the various commodity shops (e.g., wheeled, tracked, communications-electronics, preservation, etc.). Proofing the process entails;

(a) Determining whether the inputs being employed at each stage of a process are adequate to achieve the desired outcome.

(b) Assessing worker skill levels against the process needs.

(c) Examining work instructions for adequacy, purchased materials for proper type and SL, measuring and testing equipment for proper type and calibration status, and other maintenance equipment for its capability to meet specified tolerances and requirements.

(2) Measure the process outcome against the specified parameters.

(3) Document the results of in a convenient format.

b. QA personnel will proof the adequacy of the site operator's processes at least annually in the various commodity shops (e.g., wheeled, tracked, communications-electronics, preservation, etc.) prior to normal cyclic maintenance activities or prior to repair activities not associated with cyclic inspections. Proofing the process entails determining whether the inputs (people, methods, tooling, equipment, and materials) being employed at each stage of a process are adequate to achieve the desired outcome. Skill levels are assessed against the process needs; work instructions are examined for adequacy, measuring and test equipment is examined for proper type and calibration status; other maintenance equipment is examined for capability to meet specified tolerances and requirements; purchased materials are examined for proper type and SL; and the process outcome measured against the specified parameters. The results of this process proofing will be documented in a convenient format.

c. Process proofing will provide confidence in those established practices, which are in place, and provide an opportunity for early identification of problems.

SECTION III QUALITY AUDITS

4.4 THE AUDIT FUCTION

a. Quality audits will serve as a preventive tool designed to evaluate systems and processes. These audits will be performed by QA specialists/representatives on a scheduled basis to verify whether operational maintenance and supply activities comply with planned procedures.

b. QA system audits will be conducted at least annually. Audit frequency will be increased on an indication of a process or system breakdown. Checklist questions will be developed using the quality directives, policy guidance, this manual, and equipment technical manuals, as applicable.

c. Product audits will be performed by the QA staff to verify decisions made by personnel performing the QC function. Product audits will be performed on a regular basis and can serve as a basis for QA acceptance in lieu of one hundred percent inspection of each and every item. Product audits and procedural reviews shall be conducted on an interval determined by the QA staff at each site. Intervals will be adjusted as necessary to provide confidence that product quality meets established requirements.

SECTION IV. PROCEDURES REVIEW AND EVALUTAION

4.5 GENERAL

a. Procedures will be evaluated prior to and/or during cyclic inspections and subsequent maintenance activities to ensure adequate coverage of the QA program.

b. Written quality and operations procedures will be evaluated to determine if:

(1) All required instructions are available.

(2) Clear, complete, adequate, and current.

(3) Procedures will be evaluated prior to and/or during cyclic inspections and subsequent maintenance activities to ensure adequate coverage of the QA program.

(4) Procedures specify responsibilities of operating element.

(5) All applicable references are listed for each procedure.

(6) New procedures were staffed through the QA organization.

c. Reports. Procedure reviews and evaluations will be documented for the commander of the activity surveyed. This report will give findings and recommendations for each area reviewed.

SECTION V. INTERNAL QUALITY DATA

4.6 DATA COLLECTION AND USE

a. Maintenance quality data collection activities will extract data from DA Form 2404/DA Form 5988E (Equipment Inspection and Maintenance Work sheet) as prescribed in DA Pam 750-8. Data will be collected using automated systems and/ or official forms or locally developed forms.

SECTION VI. EXTERNAL QUALITY DATA

4.7 GENERAL

a. External quality data feedback includes all formal and informal reports forwarded or received by an organization, which identify existing or potential quality problems.

(1) Feedback data received is mainly generated from receiving activities incident to quality problems relating to the mechanical/physical condition of items, inadequate preservation/packing, and/or incomplete or missing documentation.

(2) Informal quality data feedback such as telephonic notifications will be included in the program evaluation process.

b. SF 368, Product Quality Deficiency Report (PQDR).

(1) An SF 368 will be prepared and distributed as required by DA PAM 750-8 to report:

(a) Quality deficiencies in equipment.

(b) Deficiencies due to design, manufacturing, overhaul, or maintenance.

(c) Suggested ideas or recommendations for improvements to equipment.

(2) Specific conditions requiring an SF 368:

(a) A condition in or with equipment that is dangerous to personnel, other equipment, or missions.

(b) An item or equipment that does not work properly or last as long as it shall due to bad design or materials.

(c) Items that are not within the size, material, hardness, finish, or performance limits of the approved equipment specifications.

(d) Low-quality workmanship.

(e) Dangerous situations due to incorrect or missing data.

(f) Maintenance problems.

(g) Conditions that prevent personnel from using the equipment.

(h) Repeated problems that require an excessive amount of time to solve.

(i) Problems asked to be reported by the National Maintenance Point. When these requests are made, the SF 368 is used to identify the problem and its nature.

c. SF 364, Supply Discrepancy Report (SDR)-shipping.

(1) SDRs must be prepared within 10 calendar days of receipt of materiel from DOD activities and General Services Administration (GSA) supply distribution facilities per DLM 4000.25, Volume 2, Supply, Chapter 17 - Supply Discrepancy Reporting whenever:

(a) Identity or condition of materiel received is found to be other than shown on the shipping document.

(b) In-checking reveals shortages or overages in excess of $100 per line item. A No dollar limitation exists on sensitive or classified material.

(c) Supply documentation is missing or is found to be improperly completed.

(d) Materiel is misrouted or shipped to the wrong activity.

(e) Any of the other conditions stipulated by DLM 4000.25, Volume 2, Supply, Chapter 17 - Supply Discrepancy Reporting are discovered.

(2) Activities receiving SDRs will investigate their files and/or operation to determine the validity of the alleged discrepancy. Action will be taken to correct or to prevent recurrence of shortcomings validated during the investigation. The complainant shall, in each case, be advised within 75 calendar days, in writing, of the results of the investigation.

d. SF 364, Supply Discrepancy Report (SDR)-Packaging. Packaging discrepancy reports will be prepared and distributed in accordance with DLM 4000.25, Volume 2, Supply, Chapter 17 - Supply Discrepancy Reporting to report generally unsatisfactory conditions including item damage or loss, resulting from improper packaging when the estimated or actual cost of correcting the deficiencies exceeds $100. In addition, a packaging discrepancy will be reported when any of the deficiency exist, regardless of the cost of correction.

e. The DoD Web Supply Discrepancy Reporting (SDR) system, found at https://www.pdrep.csd.disa.mil/, will provide a web-based entry method for SDRs, routing for web submissions and logistics transactions according to business rules, any-to-any translation to support unique and standard transaction formats, information exchange between the action office and the shipper, SDR resolution responses, capture of SDR and response management statistics and assimilation of SDR metrics along with Customer Wait Time/Logistics Response Time in support of perfect order fulfillment. This process reduces manual SDR form creation and provides an automated process for tracking SDR response information.

(1) Improper identification of containers or items, which requires opening the container or results in improper storage of the material. Any deficiencies in packaging involving dangerous/hazardous material.

(2) Improper identification marking of items, packages, or containers, including dangerous/hazardous material.

(3) Any deficiencies in packaging involving dangerous/hazardous material.

(4) Repetitive packaging deficiencies which impose a significant burden on receiving, storage, or transshipping activities or any other deficiencies cited in DLM 4000.25, Volume 2, Supply, Chapter 17 - Supply Discrepancy Reporting.

f. SF 361, Transportation Discrepancy Report (TDR). Quality personnel will provide technical support to the local transportation officer (TO) to enable the preparation of TDRs, whenever suspected transportation-type discrepancies are discovered (e.g., concealed damage). Technical support will consist of furnishing data not normally available to the TO such as inspection reports, pricing data, repair costs, references to specification, etc.

SECTION VII. DATA EVALUATION

4.8 REVIEW AND ANALYSIS OF QUALITY DATA

a. Quality data will be compiled and analyzed on a monthly basis unless apparent problems require more frequent analysis. Analysis will be made of data collected from internal feedback such as quality control inspections results/reports, product and quality system audit, process proofing, and procedures review. External data such as customer complaints will also be included in the monthly quality data review and analysis.

b. When a problem area is identified, the QA specialist will notify the responsible activity in writing. If the data indicates a need, the QA specialist/representative will perform the appropriate review or audit included in this chapter to identify and isolate the problem.

c. The analysis of data will be made to identify repetitive defects, excessive variations in product quality, rework costs, etc. Corrective actions and root cause analysis will be pursued and technical assistance will be offered to prevent and eliminate repetitive problems.

d. QA managers will perform a formal, regular, and thorough analysis of quality information covering as a minimum:

(1) Favorable and unfavorable trends.

(2) Comparison data with past performance for significant deviations.

(3) New and/or recurring problems.

(4) Dollar value or other expenditure involved.

(5) Information regarding type of defects/deficiencies.

(6) Corrective actions initiated/taken.

(7) Root causes of defects/discrepancies/ deficiencies.

(8) Significant contributors for favorable/unfavorable performance shown.

e. Adjustment of inspection effort will be accomplished as warranted by results of quality data analysis.

CHAPTER 5
PREPARING EQUIPMENT FOR STORAGE (PHASE I)

SECTION I. POLICY

5.1 GENERAL

a. Preparation of equipment involves those actions necessary to ensure equipment allocated to APS is properly prepared and ready prior to placement in storage. These requirements may include disassembly and/or removal of certain components for processing and segregated storage (see chap 2, sec V), and performance of preservation tasks. This chapter contains instructions for these actions.

b. The preservation instructions herein are for equipment, which will be stored in a CH or non-CH storage environment. CH includes CH flexible covers, containers with dehumidification equipment, or other structures or conveyances, which will provide CH environment. For equipment/vehicle systems not specifically identified herein or elsewhere in this document, reference that item's applicable technical manual containing Administrative Storage requirements for information on preparation for storage.

c. Equipment and supplies that will be containerized will have preservation and packed to Level A or B in accordance with MIL-STD-2073-1 as required by the engineering design activity.

SECTION II. INSPECTION

5.2 INSPECTION REQUIREMENTS

a. Sites shall complete the following associated tasks when receiving equipment from the respective sources with the exception of equipment designated as requiring ADR certification which will receive an annual service, ADR kit installation, and ADR certification as part of the receipt process;

(1) New Equipment Fielding (NEF) via MSC / Project Manager (PM) or Depot

(a) Receive the equipment.

(b) Initiate and document the Annual Oil Analysis Plan (AOAP).

(c) Conduct a 10/20 inspection without (w/o) the service task (i.e., pulling wheels, changing filters, etc.). This will be a joint inspection conducted with the PM if this equipment is new to the site.

(d) Verify all Test Measurement and Diagnostic Equipment (TMDE) calibrations are current for the equipment.

(e) Enter into the appropriate system of record (e.g., Modification Management Information System {MMIS}) and verify the following is true as part of the inspection;

1. All Maintenance Work Orders (MWOs) and Safety messages are applied.

2. All Safety messages (Safety of Use Message (SOUM), Ground Safety Action (GSA), Ground Precaution Advisory message (GPA), Maintenance Action (MA), Maintenance Information (MI), and Software (SW)) are acknowledged and updated in the appropriate system of record.

(f) Determine if the equipment passes inspection.

(g) If the equipment fails inspection;

1. Notify higher Headquarters of the issues.

2. Notify the previous owner (MSC/PM/Depot) of the issues.

3. Correct everything that failed inspection and work with the previous owner to ensure the equipment is repaired to 10/20.

4. Request reimbursement from the previous owner for parts and labor costs, if necessary.

(h) If the equipment passes inspection;

1. Input the 10/20 inspection as the initial service.

2. Build the appropriate Care of Supplies in Storage (COSIS) service schedule for the equipment.

3. Place the equipment into storage.

(2) Lateral Transfer (not PM Fielded)

(a) Receive the equipment.

(b) Initiate and document the AOAP.

(c) Determine whether the historical records (identifying the last service date and the next scheduled service) accompanied the equipment.

(d) If the equipment was not accompanied by the records check the ISR to see if the service documentation can be located within the LIS.

(e) Determine if the records were located within the LIS.

1. If records are not located;

(i) Create a Memorandum for Record (MFR) detailing the actions taken to obtain the service record.

(ii) Conduct a 10/20 level service

2. If the records are located;

(i) Print a copy of the Logistic Information System (LIS) service records.

(ii) Place all documents in the vehicle maintenance folder.

(f) If the equipment was accompanied by the records determine if the equipment's next scheduled service is due or if it is outside the 10% variance.

1. If service is not due and the equipment is not outside 10% variance conduct a 10/20 inspection w/o the service task.

2. If the service is due or the equipment is outside 10% variance conduct a 10/20 level service.

(g) Validate that all TMDE calibrations are current for the equipment.

(h) Enter into the appropriate system of record (e.g., MMIS) and verify the following is true as of the service or inspection w/o service;

1. All MWOs and Safety messages are applied.

2. All Safety messages (SOUM, GSA, GPA, MA, MI, and SW) are acknowledged and updated in the appropriate system of record (e.g., MMIS).

(i) Determine if the equipment passes or fails inspection.

(j) If the equipment fails inspection, conduct following actions;

1. Notify higher headquarters of the issues.

2. Notify the previous owner of the issues.

3. Repair the equipment to 10/20.

4. Request reimbursement from the previous owner for parts and labor costs.

(k) If the equipment passes inspection;

1. Enter the inspection/service into record.

2. Update the COSIS schedule.

3. Place the equipment into storage.

(3) Return after Issue (Temporary Loan)

(a) Receive the equipment.

(b) Initiate and document the AOAP.

(c) Determine if the equipment was operated more than 500 miles or was operated beyond the allowable operational hours.

(d) If either was true, conduct a 10/20 level service.

(e) If neither was true conduct a 10/20 inspection w/o the service task.

(f) Validate that all TMDE calibrations are current for the equipment.

(g) Enter into the appropriate system of record (e.g., MMIS) and verify the following is true as part of the service or inspection w/o service (whichever was the case);

1. All MWOs and Safety messages are applied.

2. All Safety messages (SOUM, GSA, GPA, MA, MI, and SW) are acknowledged and updated in the appropriate system of record (e.g., MMIS).

(h) Determine if the equipment passes inspection.

(i) If the equipment fails inspection;

1. Notify higher headquarters of the issues.

2. Notify the previous owner of the issues.

3. Repair the equipment to 10/20.

4. Request reimbursement from the previous owner for parts and labor costs.

(j) If the equipment passes inspection;

1. Enter the inspection/service into record.

2. Update the COSIS schedule.

3. Place the equipment into storage.

b. Intermodal containers will be inspected per Defense Transportation Regulation (DTR) (DoD 4500.9-R-PART VI). All containers must be certified under the provisions of the International Convention for Safe Containers (CSC). All ISO containers that move in the Defense Travel System (DTS) must be certified to meet 49 CFR and CSC/46 U.S.C. app. 1503 standards. Activities possessing DOD container(s) that transit the DTS will inspect, re-inspect, and perform organization (user) level maintenance on containers, as needed. Inspectors qualified to certify that containers meet 49 CFR and CSC/46 U.S.C. app. 1503 standards will visually inspect containers for damage and/or serviceability before being loaded to ensure safe movement. Loaded containers will be visually inspected at each transit node. Inspection frequency waiver requests for container assets in long term storage must be approved by the US Coast Guard. In accordance with AR 56-4, purchase/lease, receipt, certification, repair, and movement of all intermodal containers will be reported to Army Intermodal and Distribution Platform Management Office (AIDPMO), AMSSD-OPS-A , W0QF-AIDPMO-SAFB, Building 1900 W, 1 Soldier Way, Scott Air Force Base, IL, by email at usarmy.scott.sddc.mbx.g3-aidpmo-inventory@army.mil or by fax 618-220-6055.

c. Preservation inspection for all APS materiel will be accomplished in accordance with MIL-STD-2073-1, Appendix G, Table G-I and as specified herein.

d. Reference Table 3-5 for inspection criteria for Supply Class IX items without SL.

NOTE

M113A3/M1064A3-release the track tension on the vehicles once they are parked in COSIS due to approximately 5,000 extra pounds of armor added, which is causing wear and tear on the road arm housing assemblies.

e. Mounted track, road wheels, and sprockets will have a minimum of 50% of original thickness remaining. Unmounted track will be a minimum supply condition code B (Serviceable) in accordance with TM 9-2530-200-24, Standards for Inspection and Classification of Tracks, Track Components, and Solid-Rubber Tires.

f. Howitzer and M-1 Main Gun tubes will have a minimum of 500 rounds of effective full charge remaining.

g. Combat identification panels, weapon mounts, spare tires, and radio installation kits will be installed/mounted on end items.

h. Tires with less than 75% of the tread or with any visible sidewall damage will be replaced.

SECTION III. SPECIAL PROVISIONS

5.3 GENERAL

a. When vehicles are to be placed in outdoor storage, electronic gear such as radios, telephones, etc., shall be removed by qualified personnel and packed in accordance with MIL-STD-2073-1. Some may require following packaging instructions for Electrostatic Discharge Sensitive (ESDS) items.

b. Components separated from major end items by removal or disassembly will be tagged or marked with the identification number and identified/linked in ISR to the major end item. The end item will also be marked or tagged with the unique identification number and identified/linked in ISR showing the storage location of the removed component(s).

c. Remove and pack electronic gear in accordance with MIL-STD-2073-1 on vehicles that are outdoor for longer than 45 days prior to loading on APS-3 vessels. Some may require following packaging instructions for ESDS items. If materiel is to be stored outdoors for longer than 120 days waiting to be loaded on APS-3 vessels, the site must contact the appropriate MSC APS office for special preservation, exercising, and maintenance requirements.

d. Pneumatic tires

(1) All pneumatic tires will be maintained at operating pressure. Tires left flat for an extended time period will be replaced. Pneumatic tires, depending on tire category, have a 5 or 6-year non-extendible SL from date of manufacture. (See table below). Tires that are procured as tire and wheel assemblies have the same shelf life limits. Tires mounted on a vehicle shall be exercised periodically for 40 minutes at 30 MPH, and no later than 60 months from last use.

Table 5-1. Pneumatic Tire SL

CATEGORY	Tire SL from Date of Manufacture (Years)
Radial Military Tires (sizes include 37X12.50R16.5LT (HMMWV), 395/85R20, 14.00R20, 16.00R20 and other military specific sizes)	6
Radial Commercial Medium Truck (includes Group 3 Truck-Bus Cooperative Approved Tire List (CATL) -1922)	6
Radial and Bias Earthmover/Off-the-Road/Material Handling Equipment/Construction (includes Tire & Rim Designation E-1/E-2/E-3/E-4/E-7/G-1/G-2/G-3/G-4/L-2/L-3/L-4/L-5 and CATL-1923)	6
Radial and Bias Agricultural Rear (R-1,R-2,R-3,R-4) and Front Tires used on Industrial Tractors (I-3,F-3)	
Passenger/Light Truck	5
ATV/Garden/Industrial	5

NOTE

Tires will be inspected for serviceability during cyclic maintenance and during scheduled warehouse/ship surveillance inspections.

(2) Tires will be replaced based on condition using the guidelines contained in TM 9-2610-200-14, Operator's Unit, Direct Support, and General Support Maintenance Manual for Care, Maintenance, Repair, and Inspection of Pneumatic Tires and Inner Tubes; TM 9-2530-200-24, Standards for Inspection and Classification of Tracks, Track Components and Solid-Rubber Tires; and end item TM -10/-23 or -24 operating manuals.

(3) Retread tires will not be used on APS stock.

(4) The U.S. Department of Transportation (DOT) National Highway Traffic Safety Administration (NHTSA) requires that Tire Identification Numbers be a combination of the letters DOT, followed by ten, eleven or twelve letters and/or numbers that identify the manufacturing location, tire size and manufacturer's code, along with the week and year the tire was manufactured. Since 2000, the week and year the tire was produced has been provided by the last four digits of the Tire Identification Number with the 2 digits being used to identify the week immediately preceding the 2 digits used to identify the year.

NOTE

Tires identified as manufactured by United Tire shall be removed and destroyed.

NOTE

Fuel contamination on tires will cause a problem. Sidewalls will appear swollen, soft and spongy. In extreme cases, sidewalls may be undulated or distorted. Petroleum odor may be evident. If contamination is slight, use soap and water immediately after exposure to the contamination. This may help, but once the sidewall becomes spongy, it cannot be restored by cleaning. If there is a difference in stiffness or distortion in one sidewall when compared with the other, scrap the tire. The "damage" is in changes to the chemical properties of the rubber and the bonding between rubber and non-rubber components.

(5) Take special precautions during fueling to avoid spills and ensure tires exposed to fuel are immediately cleaned.

CAUTION

Check to assure that cylinder pressure does not exceed capacity of the pressure regulator. Disconnect nitrogen cylinder and place caps on right- and left-hand valves.

e. Lifting devices will be inspected for damage, leaks, or other deterioration during cyclic maintenance and will be tested per OSHA standards and TB 43-0142.

f. Padlocks in open storage will have their interiors coated with MIL-PRF-32033.

g. Vehicle batteries. All APS-3 equipment will use AGM or gel batteries to the maximum extent possible. All APS-3 equipment will have the batteries replaced with new batteries every maintenance cycle (based on 48-month cycles). GSE, MHE, and construction equipment will be fitted with AGM or gel batteries where possible.

h. Bulk Fuel Tankers. If the fuel tanker has residual JP-8, and there has been no contamination of the system and no tank maintenance is required, there shall be no need to clean or purge the tanker. Note that all bulk fuel tankers must be purged prior to being uploaded on Military Sealift Command (MSC) ocean going vessels (LMSR). Guidance on fuel reuse, disposal, recycling, etc., will be provided by the Army Petroleum Center. Every maintenance cycle all fuel tankers must be inspected and TM -10/-23 or 24, and IETM’s maintenance performed following all safety requirements of the appropriate TMs, PMCS accomplished, leak tested following requirements for test and inspection in CFR Title 49, Para 180.407 utilizing Vapor Integrity Test Kit Procedures. The tank must then have the same fuel that the tanker will be filled with, flushed thru the tanker system to verify that there are no leaks in the seals, fittings, valves, pumps, etc. Load JP-8 fuel in accordance with appropriate vehicle TM. Drain system completely by opening all valves, drain cocks, lift/incline front/rear of vehicle, etc. Remove filters, fuses, etc. prior to preservation. Install unused filters, fuses, etc. after preservation. Close all drains, valves, and install all caps on piping to prevent contamination. Close and secure hatches.

i. When Bradley Fighting Vehicles are placed in outdoor storage, cover the top of the vehicle with a tarpaulin to keep water from entering which could damage the electronics in the TOW 2 Subsystem.

j. Modular Causeway Systems (MCS). Refer to the Preparation for Storage and Shipment TMs for the sub-systems of the MCS. Contact US Army TACOM, Operations Center at usarmy.detroit.tacom.mbx.g3-opertionscenter@army.mil, DSN 786-7635/6194 or Commercial 586-282-7635/6194 for specific manual needed.

k. MRAP MaxxPro FoV – Vehicle shut off procedures

(1) Master Power Switch in the off position (which is UP).

(2) Fire Fired Heater Switch in the off position (which is UP).

(3) AFES Controller Disconnect - Disconnect cables from the AFES Control Modules, (2) places.

(4) AFES Battery Backup Disconnect – Harness on underside of Automotive Fire Extinguishing System (AFES) Backup Battery Unit (BBU), behind Driver seat on digipack.

l. MRAP MaxxPro FoV - Vehicle Jumping Procedure - This process lessens the risk of blowing the 10 Amp fuse.

(1) Turn off the master power of the vehicle used to jump off other vehicles prior to plugging in the slaves to the dead truck.

(2) Attached jumper cables

(3) Turn on master power

(4) Start Vehicle

SECTION IV. CLEANING PROCEDURES AND CORROSION PREVENTION PROGRAM

5.4 CLEANING PROCEDURES

a. Cleaning mobile equipment exterior and interior surfaces, including hulls, turrets, cabs, and bodies will be free of dirt, grease, and other contaminants. Contamination removal will be accomplished by any method which will not damage equipment.

(1) Wash off mud and dirt and remove stones and debris from suspension, wheels, tracks, and so forth.

CAUTION

Do not direct stream of water or steam under pressure against exterior mounted air cleaner, the opening between the hull and turret, grilles, exhaust deflectors, fire control devices, armament systems, communications equipment, and surfaces protected with rust proofing materials.

b. Cleaning material other than mobile equipment.

(1) Cleaning will be accomplished by any method not determined detrimental to the item. It will not be necessary to remove discoloration or etching that, in some cases, will be evident after rust and corrosion removal.

(2) Cleaning items or surfaces to be preserved with an oil- or grease-type preservative will be accomplished by use of MIL-PRF-680 petroleum solvent.

NOTE

A list of commercially available substitute cleaners /degreasers is included at the end of the section.

(3) Clean leather goods with saddle soap and clean, warm water. Allow leather to become thoroughly dry. Apply a light coat of neat's-foot oil. Clean metal components connected to leather goods, such as rivets and buckles, with a wire brush. Protect adjacent leather from scratching by using a sheet metal guard.

(4) Optics will be cleaned using the following:

(a) Alcohol, ethyl (ethanol)

(b) Brush, camel hair

(c) Cloth, Cotton batiste

1. A-A-50185

(d) Cloth, absorbent

(e) Paper, lens tissue

1. A-A-50177

(f) Syringe, rubber

(g) Sticks, orange (tongue depressor) or equal

(5) Optic cleaning techniques:

(a) Remove loose particles of dust from the optic surface with a camel hairbrush.

(b) Wipe optical surface in a circular motion using lens paper or cheesecloth saturated with alcohol.

CAUTION

Only lens tissue or batiste cloth is to be used for plastic optic lens components. Surface will be dried by wiping with clean cotton or lens paper.

(c) Fabricate a swab by wrapping one piece of lens tissue around the end of an orange stick and add two drops of alcohol. The swabbing operation will begin at the center of the polished surface with a light downward pressure and circular motion. Gradually increase the radius being cleaned until the entire surface has been swabbed. Repeat until all traces of dirt, lint, or smears have disappeared.

(d) A rubber syringe may be used as a bellows to remove residual dust or lint from cleaned surfaces.

(e) Immediately after cleaning, cover optics with A-A-50177 lens paper, and secure with tape, NAS833, or NAS836 plastic caps where applicable.

CAUTION

Failure to remove surface dust from optical elements before cleaning with solvent will cause scratches on the surfaces. All fingerprints and smudges shall be removed upon discovery to prevent optical etching by body acids.

(f) If surface contamination cannot be removed by using ethyl alcohol, cleaning shall be accomplished by using a solution consisting of 2 ounces detergent and one gallon of distilled water. Using a swab made of lens tissue conforming to A-A-50177, wash the optical glass surfaces with the cleaning agent described above. Washing shall be repeated, using a clean swab each time, until the surfaces are free of dirt, grime, or foreign materials. Cleaning shall be accomplished with a minimum of pressure and rubbing, without the use of cloth or rubbing materials, to prevent damage to lens coatings.

NOTE

Clean, talc-free, surgical finger cots shall be worn when handling optical elements.

(6) Electronics, and other similar devices which which might be damaged by cleaning solvents, will be cleaned by dusting (that is, wiping with clean rag, using soft brush, or blowing with low pressure compressed dry air). If additional cleaning is required, the cleaning materials referenced in TB 43-0135 shall be utilized.

(7) Communications and electronics shelters, vans or semi-trailers will be cleaned with a vacuum cleaner.

(8) Items exposed to burned powder residues will be cleaned by using MIL-PRF-680, Type III, petroleum solvent, scrubbed with a nonmetallic bristle brush saturated with a MIL-PRF-372 bore cleaner, rinsed in a clear petroleum solvent, and then drained.

WARNING

No smoking is allowed in the area where solvents are used or stored. Some cleaning solvents have a 100 degree F. flash point.

Goggles or face shields shall always be used to protect the workers' eyes.

Do not handle cleaned items with bare hands.

c. Cleaning of fuel tankers. Many different fuel tanker cleaning methods exist. Commonly used methods are water displacement, pressure washing, steaming, ventilation, and chemical. Within these broad categories there are many variations. The type of cleaning required may vary depending on the product carried by the tanker, the type of tank (e.g., stainless steel, Teflon-coated steel), and the purpose for cleaning. For long-term storage/preservation the following methods are recommended:

(1) Stainless steel tanks. For stainless steel tankers the steam cleaning process is the preferred method as specified in ATP 4-43, Concepts and Equipment of Petroleum Operations. TM 9-2330-356-14 contains an acceptable alternative method for steam cleaning stainless steel tanks.

(2) Teflon-coated tanks. Steam cleaning this type of tank with water exceeding 140 degrees F is not authorized. Pressure washing is the preferred method that will be used. Use a high-pressure solution of heated water and solvent for maximum effectiveness. As an alternative, the chemical method contained in TB 43-0212 is authorized.

NOTE

Other processes are used by commercial cleaning companies, but shall only be used after careful consideration. The use of water washes with detergent or other cleaning compounds have been used; however, it shall be used with care because of potential adverse effects on the filter elements and tank linings. Care is also needed to ensure that cleaning products are not left in the valves, outlet pipes, and other parts of the interior of the tanker.

d. Purging of fuel tankers. The preferred method of purging is to use a solvent wash, and then a hot water rinse. Immediately after the hot water rinse, the tanker must be drained of all water and dried with hot air. Prior to any tank maintenance, a vapor reading of 0.0 is required. The American Petroleum Institute, Publication 2013, ATP 4-43, and TB 43-0212 all contain guidance on how to safely vapor-free and clean mobile tanks used in the transportation of flammable liquids. TACOM Ground Precautionary Message, Control Number 94-02, Maintenance Advisory, provides proper guidance for purging fuel tankers using a biodegradable purging solution, NSN 7930-01-350-7034 or NSN 7930- 01350-7035.

e. Cleaning batteries, battery cables and battery boxes. Remove batteries from equipment and clean batteries, clamps, supports, retainers, and battery boxes using A-A-289 acid swabbing brush or equivalent and a solution of one-half pound of ASTM- D928 (sodium bicarbonate) to one gallon of water. Flush with clean water and dry. See guidance in TM 9-6140-200-14.

SECTION V. DRYING

5.5 DRYING METHODS

a. Immediately after cleaning, item(s) will be thoroughly dried. Drying will be accomplished by one or more of the following procedures, which will not be harmful to the items:

(1) Apply dry, clean, compressed air.

CAUTION

Use an oil/water separator compressed air supply lines. Separator shall be located as near as possible to the air outlets, but in no case more than 50 feet away. Separator shall be drained frequently.

(2) Wipe the items with clean, dry, lint-free cloths or specially prepared wiping papers.

(3) Apply heat using ovens, infrared lamps, or portable duct heaters.

SECTION VI. MILITARY PACKAGING

5.6 MILITARY PRESERVATION AN PACKAGING

a. Preservation of secondary items shall be in accordance with MIL-STD-2073-1 and the Special Packaging Instructions for that item with the approval of the appropriate packaging design activity. Packing shall be Level A or B. Commercial packaging, approved by the MSC/ICP Packaging Design Activity and in accordance with ASTM-D3951, may be used to satisfy the mission requirements.

SECTION VII. LUBRICATION

5.7 GENERAL REQUIRMENETS

a. Except for turbine engines, equipment will be lubricated per the applicable LO. Turbine engines will utilize the corrosion inhibited type oil under MIL-PRF-23699. The NSNs for this are as follows:

(1) 8 OZ

(a) NSN: 9150-00-180-6266

(2) 1 QT

(a) NSN: 9150-00-985-7099

(3) 55 GL

(a) NSN: 9150-00-681-5999

b. Commercial off the shelf (COTS) products may be substituted, only when approved through the waiver/deviation process, for specification preservatives.

SECTION VIII. MINOR REWORK

5.8 GENERAL REQUIREMENTS

a. Prior to spot painting, stage I, II, and III corrosion will be removed by approved mechanical or chemical means. Stage IV corrosion is not considered minor rework and applicable equipment technical manuals shall be consulted.

b. Chemical agent resistant coating (CARC) spot painting will be performed in accordance with guidance in MIL-DTL-53072, TB 43-0242, and TM 43-0139, and environmental regulations. Communication-electronics equipment shall not be CARC painted unless specified in the individual equipment TM.

c. When spot painting camouflaged equipment, the color of the original pattern will be used.

d. Determination to fully repaint equipment will be based on DALO-AMZ message dated 060808Z March 2000, Subject: New Policy for the Determination of When to Repaint a Vehicle with Chemical Agent Resistant Coating (CARC).

e. The paint color for APS-3 (Prepo Afloat)/Army Strategic Flotilla (ASF) equipment stationed in Diego Garcia (ASF-3) APS-2 AFSBn Africa, and APS-5 is tan. The paint color for APS-3 equipment stationed in the Pacific (Guam/Saipan (ASF-1)), APS-2, US Army Europe (USAREUR), and APS-4 is camouflage.

f. Equipment will be marked with UIC identification. UIC will appear on both the front and rear of each vehicle. Suitable surfaces include bumperette, tailgates, fenders, etc., and may be used, provided the UIC marking does not conflict with location and legibility of other markings. Locate markings on the right side of the front and rear of the vehicle,

centered vertically on a suitable surface. The markings will be uniform letters and numerals of the largest size practical, but not to exceed four inches in height as directed by the TB. Equipment currently marked with correct UIC will not be remarked until a change in UIC or repairs occur which obscure the current markings. All equipment is required to have bar code labels affixed in multiple locations. Use of these Bar Code labels are an acceptable substitute for painted on UIC markings.

SECTION IX. TANK/AUTOMOTIVE EQUIPMENT

NOTE

Unless specifically stated, the CH storage requirements in Section 5.9 through 5.15 below will be accomplished for all equipment in controlled temperature and RH storage. Equipment stored in other than controlled temperature and RH conditions will use the non-CH storage requirements. When there is only one requirement identified, it is to be used for both storage environments

5.9 DETAILED PRESERVATION REQUIREMENTS

The procedures in this section are in addition to the general preservation instructions in paragraphs 5.3 through 5.8. Storage of the material as prepared in this section is restricted to a Controlled Humidity (CH) environment unless approved for non-CH storage by the ASC. All TACOM equipment, supply class VII items, in a non-CH environment shall be packaged in accordance with Preservation, Packaging, Packing, and Marking Plans, Special Packaging Instructions, or unique NSN specific requirements tailored to the storage site and mission needs. These instructions shall be obtained from TACOM, War Reserve Office, AMSTA-LC-CIPRW, Warren, MI 48397-5000, DSN 786-6571.

a. Miscellaneous vehicle components.

(1) CH and Non-CH Storage

(a) All exterior, unpainted surfaces, including steering assemblies, tie rods, adjusting rods, springs, pintle assemblies, fifth wheel plates, kingpins, trailer landing gear, stabilizing jacks, and drawbar surfaces, exposed by disassembly will be coated with MIL-PRF-16173, GR 4 preservative, or MIL-PRF-10924, as appropriate. Winch cables will be coated with MIL-PRF-16173, GR 1 for non-CH storage. For CH storage, coat winch cables with MIL-PRF-10924 or MIL-PRF-18458. Surfaces or areas that require lubrication per the TM do not require additional protection.

(b) All exposed oil lubrication points, but not limited to, levers, locking bars, strikers, hinges, hinge pins, locking pins, pintle pins, locking levers, wing nuts, linkage, and threaded ends of yokes and related clevis pins will be lubricated with oil conforming to MIL-PRF-21260, grade PE 15-40, MIL-PRF-32033, or COTS approved preservatives (see paragraph 5.7.b). Working mechanism of padlocks, latches, door locks, hand operated locking knobs, and other working mechanism will be lubricated with MIL-PRF-21260, grade PE 15-40, MIL-PRF-32033 or the COTS approved preservatives. Surface or areas that require lubrication per the TM do not require additional protection.

CAUTION

MIL-PRF-32033 will not be used when preservative may come in contact with diesel fuel (e.g., fuel caps). Corrosion inhibitors in this preservative oil, when mixed with diesel fuel, can generate corrosion problems. MIL-PRF-21260 will not be used on silver surfaces for the same reason.

b. BII/COEI: Each vehicle shall contain the authorized equipment for operation, maintenance, safety, and the welfare of the crew. All BII & COEI will be inventoried, inspected for serviceability, replenished, preserved, and repackaged. The equipment will be stored in the vehicle storage locations where the parts can be secured and will not damage the item or the vehicle. Loose components that are not stored in the normal storage location will be packaged and packed to protect the contents. Normally BII/COEI is stowed on the vehicle or is packaged and stowed with the vehicle. Packages may be in wooden or cardboard boxes, or in preservation bags with desiccant, depending on the type of equipment. The preferred method of packaging is in preservation bags with desiccant. Operator level vehicle TMs, lube orders, operating logs, and other required records shall be inventoried, replenished, packaged, and stowed in the vehicle. Wherever possible, stow in map compartment or toolbox.

c. Cooling Systems. Vehicles have two types of cooling systems: liquid and air. Air-cooled engines require no special preservation procedure. Cooling systems will be protected as specified below.

(1) CID A-A-52624A replaced military specifications CID A-A-52624 (Type I and II). If your system currently uses either of the mil spec antifreezes listed above, the antifreeze shall be flushed out of the system and replaced with CID A-A-52624 equivalent antifreeze. Detailed instructions for draining, cleaning, and flushing cooling systems are given in TM 750-254.

(2) The following requirements apply to a 60/40 or 50/50 antifreeze solution consisting of either Type I and water or Type II and water mixture. The 60/40 solutions are recommended for arctic conditions while the 50/50

solution is a viable, less expensive solution for most other conditions. These solutions (A-A-52624) may be retained in engine cooling systems for an extended period of time provided the coolant meets the following requirements:

(a) Type I (ethylene glycol-green) - Freeze Point -62°F (-52°C) and the nitrite level requirements minimum of 1200-1400ppm (parts per million).

(b) Type II (propylene glycol-purple) - Freeze Point -56°F (-49°C) and the nitrite level requirements minimum of 1200-1400ppm.

(c) Testing antifreeze. Antifreeze shall be checked during the scheduled maintenance cycle. Testing of the system coolant shall include the following:

1. Test the antifreeze nitrite concentration by using antifreeze test strip that meets the requirements of CID A-A- 51461 (TEST KIT, TEST STRIPS AND COLOR CHART, ANTIFREEZE, FREEZE POINT AND NITRITE CONCENTRATION) TYPE II. Ideal nitrite concentration is between 1200 and 1400 PPM.

NOTE

Corrosion protection characteristics of CID A-A-52624 antifreeze cannot be tested with reserve alkalinity test strip. Coolant supplied under CID A-A-52624 must be tested for nitrite concentration rather than reserve alkalinity.

2. An Antifreeze and Battery Tester, NSN 6630-00-105-1418, can be used only for freeze point test.

3. The Antifreeze Freeze Point and Corrosion Test Kit (NSN 6630-01-011-5039) will still provide reliable results when testing either antifreeze solution. Alternatively, an Antifreeze Coolant and Battery Tester (NSN 6630-01-105-1418) will also work.

4. Visual inspection for coolant cleanliness, including excessive rust, foreign particles, and/or sediment.

(3) All antifreeze solutions must be premixed before adding into cooling system. Never top off cooling systems for vehicles in war reserve storage with 100% antifreeze or with 100% water. 100% antifreeze is highly corrosive. 100% water will reduce freeze point protection, degrade corrosion inhibitor protection, and reduce nitrite concentration. However, 60-40 pre-mixed antifreeze is available through DLA that does not require mixing with water.

(a) Antifreeze meeting MIL-A-46153 is compatible with antifreeze meeting A-A-52624 however, it is not recommended because at some point the antifreeze will not pass either the alkalinity test or the nitrite test.

(b) Antifreeze must be changed and recycled when it fails the testing. A variety of commercial test strips are available and can be used for nitrite level testing.

Table 5-2 Virgin/New Antifreeze

CID Type	Glycol Type	Container Size	NSN
I	EGAF 100%	1 Gal	01-441-3218 New NSN 6850-01-464-9125
I	EGAF 100%	5 Gal	01-441-3221 New NSN 6850-01-441-3221
I	EGAF 100%	55 Gal	01-441-3223 New NSN 6850-01-464-9152
I	EGAF 100%	1 Quart	6850-00-664-1399
I	EGAF 100%	1 Gal	01-441-3234 New NSN 6850-01-464-9266
I	EGAF 100%	5 Gal	01-441-3240 New NSN 6850-01-464-9263
IP	EGAF 100%	55 Gal	01-441-3248 New NSN 6850-01-464-9096
II	PGAF 100%	1 Gal	6850-01-383-4068
II	PGAF 100%	5 Gal	6850-01-441-3257
II	PGAF 100%	55 Gal	6850-01-383-3918
II	PGAF 100%	1Gal (6 in a box)	01-383-4244 New NSN 6850-01-383-4068

(c) National Stock Numbers (NSNs). NSNs for virgin and recycled antifreeze are shown on tables 5-2 and 5-3.

(d) All the NSNs above that are for the 100% Propylene Glycol must be diluted to either a 60/40 or a 50/50 solution before being added into any vehicle cooling system. Only the pre-diluted solutions can be added directly into the cooling system.

NOTE

Recycle all antifreeze in accordance with TACOM Publication “Antifreeze Recycling Users Guide.”

Table 5-3. Recycling Antifreeze

CID Type	Glycol Type	Container Size	NSN	
I	EGAF 100%	1 Gal	6850-01-464-9125	
I	EGAF 100%	5 Gal	6850-01-464-9137	
I	EGAF 100%	55 Gal	6850-01-464-9152	
IP	EGAF 60%	1 Gal	6850-01-464-9266	
IP	EGAF 60%	5 Gal	6850-01-464-9107	Discontinued w/o replacement
IP	EGAF 60%	55 Gal	6850-01-464-9096	
II	PGAF 100%	1 Gal	01-464-9131 New NSN 6850-01-383-4068	
II	PGAF 100%	5 Gal	6850-01-464-9107	
II	PGAF 100%	55 Gal	6850-01-464-9124	Discontinued w/o replacement
50/50	EGAF 50%	1 Gal	6850-01-471-6530	
50/50	EGAF 50%	5 Gal	6850-01-471-6534	
50/50	EGAF 50%	55 Gal	6850-01-471-6521	

d. Oxygen acetylene cylinders, and other compressed gas cylinders. Oxygen and acetylene cylinders, normally supplied empty as part of the BII/OVE, shall be filled to capacity and placed in a rack or crate constructed to support the bottles in an upright position. For safety reasons, the oxygen and acetylene storage racks shall be separated as directed by ship's captain or site commander. These cylinders shall be inspected /replaced at every maintenance cycle.

e. Fuel tanks

(1) Non-CH Storage

(a) Non-self-propelled equipment. Fuel tank preservation depends upon the type of fuel tank and type of engine used in the vehicle or powered equipment being processed. Fuel tanks on non-self-propelled equipment (e.g., generators, APUs, heaters) will normally be drained of fuel to the maximum extent possible

without disassembly. After draining, fuel tank will be preserved by one of the following methods, as applicable.

1. Steel fuel tanks. Fill Fuel tanks to maximum capacity with MIL-PRF-21260, grade PE-10. Completely drain the preservative oil from the tanks. Filler neck screen and cap will be coated with the same preservative oil. Replace fuel tank drain plugs and tighten properly.

2. Other than steel tanks. Certain types of fuel tanks (aluminum, fiberglass, and tanks with a synthetic rubber liner) require no preservation other than draining.

NOTE

Any fuel tanks containing gasoline must be drained and the tank flushed with preservative.

(b) Self-propelled equipment. As stated previously, equipment will be stored with fuel to facilitate rapid deployment when building codes allow. JP-8 is the authorized fuel. If only diesel fuel is available, the diesel fuel stabilizer additive must be used per paragraph 2.2.j. This additive contains both a biocide and a multifunctional antioxidant-metal deactivator-corrosion inhibit or detergent dispersant component. The stabilizer additive is available as a single package or a two-part package. Both are acceptable. The mixture ratio for these additives shall be determined by reading the application instructions on the package because different manufacturers have different ratios. Additive must be applied prior to loading, agitated, and engine run for a minimum of 15 minutes.

(2) CH Storage. If building codes or local laws do not allow fuel to be left in fuel tanks/cells of self-propelled equipment, fuel tanks/cells shall be drained and processed as specified in 5-9 e. (1) a. 1 or 2 above).

f. Gasoline engine processing (non-self-propelled). For fuel system processing, a portable container with two compartments (as shown in MIL-STD-3003) will be positioned to provide gravity feed to the engine. One compartment is filled with gasoline specified for engine operation, the other with oil conforming to MIL-PRF-21260, grade PE 15-40. The engine fuel supply line is disconnected at the most convenient point nearest the fuel tank, and the flexible line from the portable container connected to the disconnected fuel supply line leading to the engine. Then, turn the container selector valve to the fuel position. Start the engine and operate at fast idle speed, without load, until running smoothly, but not for more than 4 minutes. The engine shall then be accelerated to two-thirds maximum revolutions per minute (rpm), and, with engine still operating, switch selector valve on the portable container to the oil position. The instant the oil reaches the combustion chambers (this will be noted by loss of engine rpm or excessive smoke emitting from exhaust pipe), turn ignition off. Disconnect line from portable container and reconnect engine fuel line. After processing the fuel system, engine shall be cooled to ensure that the cylinder head temperature, measured at spark plug gasket surfaces of all cylinders, is not more than 100 degrees F. Cooling will be accomplished by induced air currents, circulation of engine coolant (for liquid-cooled engines), or by waiting the period of time required to arrive at the above specified temperature. When ambient temperature exceeds 100 degrees F, the engine shall be cooled to a temperature equivalent to the ambient. After engine has been cooled to the required temperature, processing through combustion chamber will be started and completed with minimum delay. Remove spark plugs. As the engine is cranked with the starting motor, preservative oil conforming to MIL-PRF-21260, grade PE-10, shall be atomized sprayed through each spark plug opening into the combustion chamber with low air pressure, maximum 25 PSI. The amount of oil sprayed into the combustion chamber will be one half ounce per cylinder for piston displacement up to 25 cubic inches, 1 ounce up to 50 cubic inches, 1 1/2 ounces up to 75 cubic inches, and 2 ounces over 75 cubic inches. After completion of the above and without cranking the engine, the amount of oil specified above will be atomized and sprayed into each combustion chamber. The spark plugs will be cleaned with a wire brush to ensure electrode tip is carbon or corrosion-free, check for proper gap, and installed. Equipment shown in figures 3 and 4 of MIL-STD-3003 is satisfactory for engine preservation. Fuel filters and sediment bowls will be drained. Carburetor float bowls equipped with drain plugs will also be drained.

CAUTION

Special precautions will be taken to ensure that the amount of oil specified above will not result in a hydrostatic lock. Prior to processing additional engines, the first engine will be processed as specified above and allowed to stand 12 hours. The engine will then be manually rotated, or rotated by the starter if manual turning is not possible, to ensure that the amount of oil sprayed into combustion chambers allows free rotation of the engine.

g. APUs, generators, and other small diesel engines.

(1) Non-CH Storage

(a) Remove filter can and drain fuel prior to processing the engine. It will be cooled to ensure that cylinder head temperature measured at injector nozzle flange surface of all cylinders is not more than 100 degrees. Cooling will be accomplished by induced air currents, circulation of engine coolant, or by waiting the period of time required to arrive at the above specified temperature. When ambient temperature exceeds 100 degrees

F, the engine will be cooled to a temperature equivalent to the ambient. After the engine has been cooled, the fuel supply system from the fuel tank will be shut off. A portable container will be positioned to provide gravity feed to the engine compartment filled with MIL-PRF- 21260, PE 15-40 preservative oil. Disconnect the fuel line between the primary fuel filter and fuel pump at the primary fuel filter outlet. Drain the residual diesel fuel from the secondary fuel filter. If equipment is not equipped with a secondary fuel filter, disregard all requirements concerning the secondary fuel filter.

(b) Remove filter can and drain fuel in accordance with local ordinance. Fill filter can with MIL-PRF-21260, PE 15- 40 preservative oil. Disconnect residual vehicle fuel return line at quick disconnect coupling. Connect a transparent plastic fuel line to the engine end of the disconnected fuel return line. Insert the other end of the plastic fuel line into a recovery container to collect the residual returned oil. Fabricate an air restrictor plate of plywood, slightly larger than the air intake, and attach a 5/16-inch-thick rubber (same size as plywood) with MMM-A-260 adhesive. Start engine and run for 5 minutes on MIL-PRF-21260, PE 15-40 preservative oil. The throttle will be placed in half-open position and the engine choked by placing fabricated air restriction plate over the air intake until the engine stops. The valve on the auxiliary fuel container will be turned to the OFF position. Disconnect transparent fuel line and reconnect fuel return line. Disconnect portable fuel line and reconnect fuel line. Drain fuel cans and install new filters.

(2) CH Storage. Engines operated on JP-8 or JP-5 fuel do not require further preservation provided the engine are exercised every 180 days.

h. Crankcase and crankcase openings.

(1) Engine crankcases will be filled to operating level with preservative/operational oil conforming to MIL-PRF-21260, grade PE 15-40, or the grade specified in the vehicle TM.

(2) Turbine engines are not designed to use MIL-PRF-21260 oil. The operational, but corrosion-inhibited type, described by MIL-PRF-23699 will be used in the M-1s. If the NSNs identified in Section VII above are not used, four (8oz) cans of oil additive, NSN 6850-00-142-9582, will be added to each engine. Every cycle, add one can of oil additive and change when required by AOAP.

NOTE

The hours will be manually recorded on DA Form 2408-20 (Army Oil Change Log). This form will remain with the item. Hours recorded will include time expended performing COSIS, installing MWOs, PMCS, and travel between port location and maintenance operations.

NOTE

Operations personnel are required to recycle oil.

i. Air cleaners (oil bath-type)

(1) Non-CH Storage. Fill air cleaner (oil bath-type) to operating level with same preservative oil used in crankcase. Interior of air cleaner, above oil level, will be sprayed with MIL-PRF-21260, PE 15-40, and element reinstated. Oil bath and dry-type air cleaner openings will be sealed with tape conforming to type IV, ASTM-D5486 tape or covered with 6-mil polyethylene conforming to A-A-3174, secured with type IV, ASTM-D5486 tape.

(2) CH Storage. Fill to operating level with same preservative oil used in crankcase.

j. Transmissions. Transmissions that operate on MIL-PRF-2104 type lubricating oil will be filled to operating level with preservative oil conforming to MIL-PRF-21260, grade PE-10 or PE 15-40, as specified in the applicable LO. Transmissions that do not normally operate on MIL-PRF-2104 type oil will be filled to operating level with operational oil, as specified in the applicable LO. Operate through all ranges for a minimum of 1 minute at a sufficient speed to assure lubricant coverage of all interior parts and surfaces. Check TMs for procedures.

k. Differentials, transfer assemblies, and power takeoff assemblies. Differentials, transfer assemblies, power takeoff assemblies, and other gear-driven units, except those lubricated by the unit to which they are attached, will be filled to the operating level with the applicable grade of new operational oil as specified in the LOs. Check TMs for procedures.

l. Brake system.

(1) Non-CH Storage. Coat exterior, unpainted, or threaded surfaces, such as cables, clevises, and linkage of service and parking brakes, with MIL-PRF-16173, grade 4 preservative. All brake drums and clutch plate assemblies will have A-A-52465 primer applied prior to going into storage. Fill hydraulic brakes with operational hydraulic fluid as specified in the applicable drawing, specification, or LO. Compressor air outlet will be disconnected. Compressor equipment with air cleaner will have the cleaners removed and air inlet sealed with tape or covered with plastic A-A-3174, 6 mil, polyethylene and sealed with tape. Compressor

equipment with air strainers will have the strainers removed and coated with MIL-PRF-21260, grade PE-10, preservative oil. While the compressor is being operated (e.g., during engine preservation) one-half ounce of MIL-PRF-21260, grade PE-10, will be atomized sprayed into compressor air intake until oil appears at outlet. Air outlet will be disconnected and air cleaner or air strainer reinstalled. Air reservoirs will be drained of all condensation and interior surfaces atomized sprayed with oil conforming to MIL-PRF-21260, grade PE-10. Warning tags shall be prepared indicating any area sealed and shall be securely attached in the driver's compartment in a conspicuous location. When applicable, brakes shall be caged to prevent galvanic corrosion from contact.

NOTE

Acceptable alternative process for the air compressor preservation can be accomplished by removing air cleaner or air hose from compressor. Open compressor tank drain plug. Run compressor at normal operating speed for 2 minutes. This forces all water out of system. Slowly spray 8 ounces of MIL-PRF- 21260, grade PE-10, preservative oil into compressor intake using and oil spray gun or can. Turn off compressor when all 8 ounces of oil are sprayed into compressor.

NOTE

Drain valves will be closed. Exposed ends of service air lines and dummy couplings will be covered with tape. Air line filters will be drained and closed. Exhaust ports of relay emergency quick release and relay valves not equipped with exhaust check valves will be closed by inserting plastic plugs conforming to NAS833 OR NAS836 or sealed with tape.

(2) CH Storage. Drain air tank and leave valve open. Fill with operational (MIL-PRF-46176) hydraulic brake fluid to operating level. Either NAS833 OR NAS836 caps or ASTM-D5486, Type IV, tape, will cover dummy couplings. Place warning tag on any brake valve left open to ensure valve is closed prior to use.

m. Tarpaulins

(1) Non-CH Storage. Tarpaulins such as soft-top cab, grill cover, cargo body cover, etc., requiring repair and treating will be removed, repaired, and treated, as necessary. Tarpaulins will be stored in covered storage.

(2) CH storage. Above applies, except that tarpaulins may be installed on equipment.

n. Where the lubricating system is separate from the associated power unit, the air compressor crankcase will contain preservative oil conforming to MIL-PRF-21260, PE 15-40, as specified in the LO, filled to operating level. Compressor air outlet will be disconnected. Compressor equipment with air cleaner will have the cleaners removed and processed as specified in paragraph i above. Compressors equipped with air strainers will have the strainers removed and coated with MIL-PRF-21260 preservative oil. While compressor is being operated during engine preservation (see paragraphs f and g above, as applicable), one-half ounce of the same grade of preservative oil will be atomized and sprayed into compressor air intake until oil appears at outlet. Air outlet will be reconnected and air cleaner or air strainer reinstalled.

o. Cabs

(1) Non-CH Storage. Door hinges, latches, and operating mechanisms will be lubricated with MIL-PRF-21260, grade PE 15-40, preservative oil. Operating mechanism of locks will be lubricated with MIL-PRF-21260, grade PE 15-40 preservative oil, MIL-PRF-32033, or COTS approved preservatives. Vehicles shall not be rust proofed. Rubber molding not directly exposed to the elements, wherein metal-to-molding or molding-to-molding contact is involved (that is, around doors, windows, and vents), will be dusted with talc, technical T1 of A-A-59303. Drain holes will remain open. Windows and air vents will be closed and secured.

(2) CH Storage. All of the above is required except windows will be left open for ventilation and access once the equipment is placed in storage. All cab air vents will be left in open position.

p. Bodies. Secure body drains in the open position. Hydraulic systems will be filled to operating level with operational hydraulic fluid as specified in the applicable LO. Exposed surfaces of the hydraulic ram will be coated with MIL-PRF-10924 automotive and artillery grease, wrapped with barrier material conforming to type II, MIL-PRF-121, and secured with tape conforming to ASTM-D5486, Type IV, tape. Body drains and ventilators will be placed in an open position to provide all possible ventilation. Door hinges, latches, and operating mechanisms will be lubricated with MIL-PRF-21260, grade PE 15-40, MIL-PRF-32033, or COTS approved preservative oil Doors will be closed. Doors may be removed to facilitate access during storage and secured in vehicle.

q. Special purpose vehicles and vehicles with special preservation requirements.

(1) Water Tank

(a) Non-CH Storage

1. Clean metal water tank body in accordance with applicable TM using a cleaning compound conforming to A-A- 59133 (steam cleaning). After cleaning, drains and lower outlets will be left in open position and openings covered with fine mesh aluminum screen, secured in place with tape conforming to ASTM-D5486, Type IV, tape. Drain plugs will be removed. Metallic drain plugs will be coated with MIL-C-10382 preservative and packaged in a bag. Bag will be closed by heat sealing or taping with ASTM-D5486, Type IV, tape and secured to a faucet or within equipment compartment.

2. Rubber seals of hatches and top openings will be coated with talc, technical T1, A-A-59303, and forward outlet, hatches, and top openings closed and secured. Equipment compartment drains will be secured in open position and compartment doors closed and secured to prevent pilferage or damage. For steel tanks, other than stainless or pre-coated, all interior surfaces will be coated with MIL-C-10382 preservative. The pump will be operated allowing the preservative to drain through outlet nozzle and introduce a sufficient amount of MIL-C-10382 preservative to ensure complete coverage of TM 38-470 areas within the pumping system from intake to outlet. After completion of application of preservative, drain plug will be removed and the system completely drained. Drain and top plug will be reinstalled.

NOTE

MIL-C-10382 must be applied at or near room temperature. Application below 65 degrees F may cause clotting or clogging of piping and fixtures. Do not substitute any type of preservative for MIL-C-10382 on any food handling or potable water dispensing systems.

3. Fiberglass tanks will be cleaned with nontoxic detergent and warm water, followed by a clean water rinse. Remove drain plug and drain interior of tank Interior piping, other than stainless steel or plastic, will be coated with MIL-C- 10382 preservative. Drain plug will be reinstalled. On water pumping systems, drain plug on bottom of water pump will be removed and pump completely drained. Drain plug will be reinstalled. The 1/4-inch plug will be removed from the tee on top of pump and the pump filled with MIL-C-10382 preservative.

(b) CH Storage. Same as for non-CH storage except tank openings and doors will be open to maximize air circulation.

(2) Dolly Sets

(a) Non-CH Storage and CH Storage. The Equipment Preservation Data Sheet (EPDS), Preparation for Shipment and Storage, shall be used as the implementing document for MIL-STD-3003 when preparing Dolly Sets for storage. EPDSs are available from CDR, TACOM, ATTN: Packaging, AMSTA-LCL-IA Warren, MI 48397-5000. Dolly sets will be stored with lift cylinders fully retracted Drain condensation from air brake system valves by opening drain cocks or removing drain plugs. Place tags on valves as reminder to replace drain plugs and close drain cocks when equipment is activated.

(3) M1000, Semi-trailer, 70 Ton. The M1000 is certified for crane lift with a payload weight not to exceed 50,000 lbs. (25 ton). During PMCS ensure all steering cylinders, gooseneck cylinders, rear ramp cylinders, rear slave cylinders, and suspension cylinders (10) are greased with MIL-PRF-10924 on exposed surfaces of the rods. Secure each ramp to the ISO bracket mounting holes on the platform using steel strapping, ASTM-D3953, 1-1/4 x 0.031. Route strap through two ISO bracket mount holes in platform and crimp binding clip to strap. Route opposite end of strap around top cross bar on ramp, tighten strap as tight as possible and secure with binding clip. Use corner protectors between strap and ISO bracket mounting holes and between strap and the top cross bar. Strap chocks in place using 4 X .0035 steel strapping. Open cover of rear support legs, lower rear legs, apply grease to outside surfaces, and return to up position and close cover. Apply preservative, MIL-PRF-16173, Grade 4, to all unpainted, bare metal surfaces on trailer deck F pins, cables, and ISO brackets. Drain all air reservoirs of condensation. Spring loaded drain valves are located under air tanks and are operated by pulling a lanyard. Ensure air flow stops when lanyard is released. It is not necessary to spray any preservative into interiors of the tanks. Drain all air line filters and close.

(4) M1074 / M1075, truck, PLS. The following applies in addition to normal preservation specified above. Air brakes reservoirs are corrosion resistant and do not require preservation. The air dryer desiccant shall be replaced every cycle.

(5) Fuel Tankers Preservation. Fuel tankers shall be fogged using MIL-PRF-21260 oil provided the tanker is not contaminated with water or any chemical cleaners.

(a) Procedure to for the M969A1 tanker is as follows

NOTE

All fuel shall be drained from tanker. Prior to start close all valves and drain holes.

1. Remove pump strainer and plug by oil/water separator. Open valves B, G, and H. Insert nozzle and hose at valve B. Push the nozzle towards the area of valve G and H start spray and let run for approximately 5 minutes. Check in the area of the removed strainer fog shall be seen.

2. Block off the opening at the pump strainer. Open up Valve A creating a chimney effect into the tank. Spray for approximately 5-10 minutes. Check the bottom of tank from the top and ensure spray is getting to the bottom of the tank. After 5-10 minutes close Valve A and remove nozzle from Valve B.

3. Place the nozzle in the pump strainer area. Push the nozzle past the bend in the pipe and start spray. Spray for 5 minutes. Check the opening a Valve B to ensure fog is coming from there. After 5 minutes move the nozzle to the pipe opening of the pump spray for 2 minutes. Remove nozzle from strainer area and place into top opening of the pump spray the housing area of the pump moving the nozzle up and down for approximately 2 minutes. Remove nozzle from pump spray strainer and place back into pipe tighten clamp. Close all valves.

4. Open Valves B and F and remove fill plug on pump. Place nozzle in opening at Valve B and spray for approximately 5 minutes. Check the opening at fill plug on pump to ensure fog is coming from the opening. Replace the fill plug and remove nozzle from Valve B opening.

5. Push open the bottom load stop with blunt instrument. Place nozzle into opening and spray for approximately 2-5 minutes. Close Valve F and open Valve A again spray for 2-5 minutes. Close Valve A and remove nozzle from bottom load stop. (M969 Models - spray Valve B and cap area and then go to step 7)

6. Open Valve K and remove drain plug on one of the flow meters. Insert nozzle at opening at Valve B and spray for approximately 5-10 minutes. Check drain plug on meter to ensure oil is getting there. Replace drain plug in the first flow meter and remove drain plug from second flow meter. Keep spraying for another 5-10 minutes. Take nozzle out and spray into the drain plug of meters coating the housing of the flow meters (do both meters). Replace drain plugs. Spray Valve B and cap area and close.

7. Using a long pipe pump approximately 5 gallons of oil into the dump valve area of tanker. Open Valve A and Valve J to drain oil from the tank. Once all oil is drained close Valve A and J.

(b) Procedure for the M978 HEMTT Fuel Tankers is as follows:

1. Remove the drain plug from the primary pump, insert the wand and fog the pump. Replace the drain in the pump. Fog the interior of the tank then place the wand near the V1 valve in the bottom of the tank to get preservative into the pipes below the tank. Close the manhole. Open the filter separator and remove the filters and canisters and fog the interior of the filter separator. Open receptacles A, B, C, and D at the back of the tank and fog the internal piping, and then cap the receptacles. If the tanker is equipped with a vapor recovery (VR) system, open the VR receptacle at the back of the tanker module and insert the wand to fog the pipes, and then recap the receptacle.

(c) Fuel tankers that have been contaminated with hot water, steam, solvent wash, or chemical, must be flushed with preservative oil, MIL-PRF-21260. Fill and flush following the same procedures for filling tankers with fuel in the appropriate TMs and operate all equipment to ensure all contaminates are removed and surfaces coated with the preservative oil. Flushing is necessary to remove the water/chemical contamination. Emptied preservative oil may be reused for processing other fuel tanks, provided not more than 10 percent (%) of the fluid is contaminated, see ASTM-D287.

(6) Fifth Wheel Towing Device Preservation. Fifth wheel towing devices shall be preserved in accordance with TM 9-2510-247-13&P. Optimum storage configuration is for the fifth wheel towing device to be attached to the prime mover.

(7) Load Handling System, M1120 HEMTT, Preservation. Load Handling Systems, HEMTT shall be preserved in accordance with TM 9-2320-279-20. IETM HEMTT A0 and A1 TM 9-2320-279-14&P; HEMTT A2 TM 9-2320-325-14&P; HEMTT A4 TM 9-2320-326-14&P.

r. Trailers

(1) Non-CH Storage. The EPDS shall be used as the implementing document when preparing trailers for storage. Coat unpainted, exposed metal surfaces with MIL-PRF-16173, GR 4 preservative. Preserve hinges, latches, and operating mechanisms with MIL-PRF-21260, PE 15-40 preservative oil. Store in a manner that will allow drainage. Small trailers can be positioned on end to conserve storage space using dunnage and a barrier between ground and metal surfaces. Position the trailer so that hydraulic brake fluid reservoirs are above the level of the wheel cylinders. Use solid filler plugs to prevent fluid leakage. Trailer bed decking (wood) will deteriorate in open storage. Ensure all replacement decking meets the technical requirements for replacement decking. Wood will be pressure treated, sealed with a commercial wood sealer, and CARC painted in

accordance with MIL-DTL-53072 and TM 43-0139. For long-term storage of the M870A3 semi-trailer, use the BII chains and binders to chain the gooseneck to the deck in the retracted position. Follow vehicle TM for instructions.

(2) CH Storage. Same as for non-CH storage except that the MIL-PRF-16173 does not need to be applied.

s. Winch and Derrick Assemblies

(1) Non-CH Storage. Winch gear and other gear-driven units will be filled to operating level with MIL-PRF-2105 grade GO 80-90 or MIL-PRF-21260, grade PE-30, as specified in the LOs. Unwind cable (except coated winch cable), and preserve entire cable with MIL-PRF-16173, Grade 1.

CAUTION

Place gear box shift levers in the neutral position. Exposed, unpainted metal surfaces of cable drums, sheaves, snatch blocks, boom block, A-frame, crane, derrick boom controls, and linkage shall be coated with the same type preservative. Coat exposed surfaces of hydraulic position rod with MIL-PRF- 10924 preservative; wrap with barrier materiel conforming to type II MIL-PRF-121; secure with tape conforming to ASTM-D5486, type IV, tape. Paint the cover from the winch automatic brake assembly of brake disc and brake band with synthetic primer. Coat adjusting pin, string, and related hardware with MIL-PRF-16173, grade 4. All disassembled items will be reassembled.

(2) CH Storage. Winch gear and other gear driven units will be filled to operating level with MIL-PRF-2105 or MIL-PRF-21260, grade as specified in lube order. Unwind cable (except coated winch cable) and preserve with MIL-PRF- 10924.

t. Gear chain drive. Coat unpainted exposed gears and non-precision drive chains with MIL-PRF-21260, PE 15-40, preservative oil to ensure penetration to inner surfaces of rollers, pins, and bushings. Drain excess MIL-PRF-21260, PE 15-40, preservative oil.

u. Batteries, cables, and battery box.

WARNING

Charging batteries produce hydrogen gas, which is explosive. Charge batteries only in well ventilated areas (e.g., battery rooms) and don't smoke or allow open flames or sparks anywhere near the battery. Always turn off the battery charger before connecting it or disconnecting it from the battery. Never attempt to charge a frozen battery because it might explode. Allow it to warm to 60 degrees F before hooking up the charger.

CAUTION

Disconnect the battery from vehicles equipped with computer(s) prior to charging the battery. Failure to do so may cause damage to the computer(s). Chargers include their own instructions. Failure to follow the instructions included with the charger may cause battery damage or failure. Always follow the instructions included with the charger. Never disregard the safeguards and procedures provided by the manufacturer. Generally, slow charging is best, since there is little chance of damaging the battery by overcharging (one of the major causes of battery failure).

(1) Remove batteries from equipment. Clean as specified in paragraph 5.4f. Preserve battery cable clamps with grease (GAA), petrolatum (VV-P-236), or silicone fluid conforming to MIL-PRF-46146, Type I, Group II (NSN for an 8-ounce tube is 8040-01-009-1562). TM 9-6140-200-14 is the Operator's Unit, Direct Support, and General Support Maintenance Manual for Lead-Acid Storage Batteries. Follow TB 43-0134 for Battery Disposition and Disposal. Use epoxy paint in accordance with MIL-PRF-22750 to paint the battery box. This is a high solids CARC type paint and if used on the complete interior surfaces of the box there is no need to use a preservative. If only a few spots need additional protection and the interior of the box does not require repainting, use either MIL-PRF-16173, Grade 1, or MIL-C-450. These preservatives are hard drying black preservatives. If the epoxy paint is used, epoxy pre-treat (MIL-PRF-85582 or MIL- PRF-23377) the surface, and neutralize the box in all cases. All stowed vehicles aboard APS3 vessels having the AGM type battery will have both positive and negative terminals disconnected and protected. Valve Regulated Lead Acid Batteries. Absorbed Glass Mat (AGM) and activated flooded lead acid batteries will be maintained in accordance with ASC Battery Maintenance Management Plan.

v. Inter-vehicular jumper cable, air lines, and safety chains. The inter-vehicular jumper cable will be secured to the vehicle with tape conforming to ASTM-D5486, Type IV or SAE AS33671 tie-down strap. Tape will completely encircle

the adjacent vehicle member and overlap approximately 6 inches. Connectors at end of air lines will be secured in dummy couplings provided. Loose portions of air lines and safety chain will be secured to the vehicle as specified for inter-vehicular jumper cable. Cables and air lines will have a bend of not less than a 24-inch diameter when secured to the vehicle. In cases where the tractor is connected to the trailer, all lines, cables, and chains may remain connected.

w. Heaters fuel operated.

(1) Non-CH Storage. Heaters with separate fuel supply will have their fuel tanks processed as specified in paragraph e above. Engine heaters installed in multi-fuel engine vehicles will have the fuel supply shutoff valve, located at the inlet side of fuel filters, turned to the OFF position. On gasoline engine vehicles, the personnel heater shutoff valve located at the heater fuel line tee on the vehicle fuel pump and the engine heater shutoff valve located in the rear of the battery compartment will be turned to the OFF position. The main fuel line supplying fuel to the heaters will be disconnected at a point closest to the shutoff valves, and fuel from fuel lines will be allowed to drain. Reconnect fuel lines. Seal exhaust stacks with ASTM-D5486, type IV, tape.

(2) CH Storage.CH storage is the same as for non-CH storage except sealing the exhaust stacks is not required.

x. Diesel and multi-fuel Engines.

(1) Non-CH Storage. The engine will be cooled to assure that the cylinder head temperature measured at injector nozzle flange surface of all cylinders is cooled to less than 100 degrees F. Cool the engine to equal the ambient air temperature when said temperature exceeds 100 degrees F. After the engine has been cooled, the fuel supply system from the fuel tank shall be shut off and the fuel tank and lines up to shut off valve drained and flushed with preservative oil. The fuel system and combustion chamber will be processed in an uninterrupted manner.

(a) Fuel System. A portable container or a supply line shall be positioned to provide preservative oil to the engine. The engine fuel supply line shall be disconnected at the most convenient point nearest the fuel tank, and a flexible line containing the preservative oil supply connected to the disconnected fuel supply line leading to the engine. Drain diesel fuel from the fuel filters and fill with preservative oil. The engine shall be started and operated at fast idle until running smoothly, but for not more than 4 minutes. Accelerate to 1/2 throttle and run for 3 minutes and then shut down by conventional methods.

(b) Combustion Chamber Processing. The engine shall be cooled to 100 degrees F (see above). After the engine has been cooled, an air restrictor plate shall be installed at the nearest and most convenient place to cut off the air supply to the engine. With the fuel system filled with preservative oil, MIL-PRF-21260, Grade PE 10-1, the engine will be cranked for 10 seconds. Remove the preservative oil supply line and reconnect the fuel supply lines and open the fuel shut off valves. Drain filters, remove filter elements and replace with new elements and gaskets. Level A vehicle processing requirements for each vehicle model contain unique engine/vehicle processing requirements and shall be reviewed prior to processing engines for outside storage.

(2) CH Storage. Engines will be preserved as in (1) above or, as an alternate, may be stored fueled as long as the fuel is JP-8. Fuel quality must be monitored, and combat vehicles exercised every 24 months and tactical vehicles exercised every 48 months (see chap 6).

y. Combat Equipment

(1) Non-CH Storage. Combat equipment shall not be stored in open storage. When absolutely necessary and storage time will exceed 90 days, process equipment to Level A requirements provided by the appropriate Major Subordinate Command and paragraph a through x above as appropriate.

(2) CH Storage. Process combat equipment as follows:

(a) As appropriate, the guidance of paragraph a through w above applies.

(b) Vehicles will be clean, including battery supports and retainers, seats, gun, and fire control, periscopes, vision blocks, etc. The cleaning process shall not permit liquid to enter interior compartments and cause damage or deterioration.

(c) Any vehicle surface susceptible to corrosion or deterioration shall be preserved. Preservatives selected must be sufficient and safe when used for the intended purposes.

(d) All combat vehicles have unique vehicle processing specifications for shipment and storage that detail unique requirements and these shall be used for specific guidance.

(e) Quadrant, periscope, telescope, etc. After cleaning, per paragraph 5.4b(4), optics shall be covered with lens tissue, A-A-50177, and secured with tape.

CAUTION

Tape shall not be allowed to contact lens. The tape will damage the coating on the lenses.

(f) Exterior hatches and doors. Rubber seals around hatches and doors will be dusted with talc. Where practical and stow permits, doors and hatches shall be open to allow for air circulation during stowage.

(g) Drains/Vents. Secure in open position during stored. Install screens in drains.

(h) When necessary for meeting clearance requirements on the ships, items such as radio antennas may be removed and stowed in the vehicle. Additional disassembly requirements must be in accordance with the vehicles transportability guidance technical manual. Any other disassembly must be approved by ASC.

z. Special requirements for CH storage on APS-3 vessels as defined below apply for the M1 tank:

(1) Reference ATPD-2240 for details on processing (Reference Level B for CH Storage).

(2) Oil preservative per MIL-PRF-5606H, e.g. Brayco 599 oil preservative, is incorporated into the engine oil, MIL-PRF- 23699. Run the engine until normal operating temperature is reached. During each scheduled maintenance cycle, add one can (eight (8) fluid ounces) of oil preservative if the vehicle has over 5 hours of operational time since last cycle. If the vehicle has operated less than 5 hours, the adding of the can is not required.

(3) Fuel, JP-8, will be in the tanks in quantities of at least 1/4 full to a maximum of 1/2 full. Drain unpreserved fuel (other than JP-5 and JP-8) from all tanks, put new preserved fuel in front tanks, operate personnel heater for 15 minutes, pump fuel to the rear, operate engine for at least 5 minutes. Turn the smoke generator "On" and run the engine through a "False Start" cycle for approximately 5 seconds to induce the preserved fuel into the smoke generator pump.

CAUTION

Cushion wrap gunners thermal site.

CAUTION

Ensure exhaust port is venting.

(4) Attach a radioactive substance WARNING tag to the gunner’s thermal sight. The antireflective coating on the outside right window of the sight head is slightly radioactive. Fragments of this material constitute a health hazard if swallowed, inhaled, or allowed to enter the bloodstream through an open wound. If a broken window is encountered, coordinate with the local radiation safety officer and NRC license holder for appropriate actions and notify responsible personnel for disposal of broken parts.

(5) Remove radio antenna and secure in vehicle.

(6) Relieve hydraulic pressure in the turret.

(7) Open driver's drain valves and secure in open position with safety wire.

(8) Install screens at drain valve openings, tape in place.

(9) Place tag in driver's compartment to ID screens, and open drains.

(10) The hull and turret ammo doors can be left open: the hydraulics for the turret doors must be locked when in the open position.

(11) The loader's machine gun mount can be stored in place in the locked position at the position marked stow. Otherwise, remove the mount and stow securely in the vehicle's storage box. Apply preservative oil MIL-PRF-21260 to bare metal surfaces of both machine gun mounts.

(12) Loader's seat back shall be folded down on the seat bottom and loader seat post preserved with MIL-PRF-10924 grease.

(13) Breech lever shall be stored in breech level stowage box.

(14) Driver's periscope washer reservoir shall be empty.

(15) Hatches will have rubber seals covered with talc.

(16) Open the hatches after stow in CH environment.

(17) Remove all fabric cargo straps and stow in vehicle’s stowage box.

(18) Ensure that the stowage box is closed and secured.

(19) Preserve, pack, and stow BII on the BII rails (see TACOM ATPD 2240). Select BII/OVE may be stowed in the normal operational location provided it can be secured to prevent damage to itself or other tank components. BII box size for M1A1 is 64 x 40 x 14 with three skids each placed so there is 48-1/2 inches plus or minus 4 inch inside two outside skids. Band box to rails with 1-1/4 inch steel strapping x 0.031 inches.

(20) Coil radio cables and secure on top of radio mounting bracket with tape. Preserve cable connectors by spraying with MIL-C-81309, type 3, class 2, NSN 8030-00-546-8637 (only on connectors that are not connected).

(21) The main vehicle batteries are to be disconnected. The Computer Electronic Unit (CEU) battery information shall be recorded and the CEU battery removed.

(22) Deplete parking brake pressure by repeatedly activating the parking brake until gauge reads zero.

(23) Night vision devices will be stored in accordance with the following:

(a) Remove the stowage box for the Drivers Night Vision (DNV) from the Driver's compartment by removing all mounting bolts. Open the front of the DNV stowage box and measure 1" down from the top of the stowage box on the back wall of the stowage box and 1" in from the right side of the stowage box. Drill a 1/2" diameter hole at the intersection of these two measurements.

(b) Measure 1" in from the top right side of the stowage box cover and 3" forward from the rear of the stowage box cover. Drill a 1/2" diameter hole at the intersection of these two measurements.

(c) Remount the DNV stowage box in its proper location in the Driver's compartment.

(d) Place the DNV in the stowage box and secure it with the straps provided. Close the cover of the stowage box. Loop seal (5340-00-084-1570) through both of the holes previously drilled in the DNV stowage box and seal by placing the male end of the seal into the female end of the seal. Seal will automatically lock when the male end is fully seated. The DNV is now considered ready for shipment.

(e) To access the DNV following shipment of the tank, cut the ant pilferage seal, which has been looped through the back and cover of the DNV stowage box.

aa. Vehicle air conditioning systems.

(1) Non-CH Storage. All refrigeration systems will have charge reduced to 1/4 charge and systems checked for leaks and exercised every 180 days.

(2) CH Storage (land-based sites). All refrigeration systems will be purged, filled with nitrogen and tagged with the following information; this equipment is not in an operational state. Purge nitrogen, pressure test, and recharge prior to initiating operation. This must be accomplished every maintenance cycle as part of the PMCS and exercise requirement.

(3) CH Storage (afloat). Fully charge all refrigeration systems and exercised every 180 days as part of the exercising.

SECTION X. WEAPONS

5.10 DETAILED PRESERVATION REQUIREMENTS

a. Cannon (gun and howitzer, vehicle mounted or towed).

(1) Non-CH Storage. The unpainted cannon surfaces, including breech mechanism and machine surfaces underneath the bore evacuator, will be thoroughly cleaned with MIL-PRF-372 (bore cleaner) and subsequently cleaned with MIL-PRF-680, Type III petroleum solvent. The painted surfaces will be cleaned by wiping with clean, dry rags. Immediately after cleaning, the bore, chamber, and machine-finished surface under the bore evacuator of the cannon will be coated with MIL-PRF-3150 preservative oil. Excess oil will be allowed to drain from coated surfaces. A strip of VCI- treated material will be cut and rolled into a tube o fit the length of the cannon chamber and bore, with the VCI-treated surface on the outside when not stored in a CH environment. All unpainted surfaces of the breech block, breech mechanism, and firing mechanism will be coated with MIL-PRF-10924, Grade A, grease. Cannons with unpainted barrel surfaces will require a coating of MIL-PRF-10924; Grade A, grease on these surfaces. The muzzle end of the cannon, including the muzzle brake, will be covered with a bag fabricated from A-A-3174 polyethylene film, 6-mil thick, black. Secure cover in place in a manner, which will prevent entrance of air and moisture using tape. The breech shall be closed. On M1A1 tank turrets the travel elevation and transverse locks shall be secured and the exterior ballistics door to the gunner's primary sight shall be locked. Perform a zero pressure check.

NOTE

In desert or dusty environments, while in COSIS, replace MIL-PRF-10924; Grade A, grease with DRY Graphite Lubricate or Dry Lithium Lubricant (i.e. Sandstorm)

(2) CH Storage. Above applies except that the muzzle will not be capped and either MIL-PRF-3150, MIL-PRF-22160, PE 15-40, or MIL-PRF-63460 (CLP) will be used as a preservative oil. Do not use VCI material or cap muzzle.

b. Recoil mechanism. Accessible machined surfaces of the cannon immediately forward of the recoil mechanism will be coated with MIL-PRF-10924 automotive and artillery grease.

c. Elevating and traversing mechanisms, turret ring bearings. Exposed, unpainted surfaces of elevating mechanism, trunnions, and turret traversing ring gear and elevating hand crankshaft will be coated with MIL-PRF-10924 automotive and artillery grease. Handle lock pin, turret ring bearings, and plugs will be removed from grease fitting openings, grease fittings installed, and MIL-PRF-10924 automotive and artillery grease pumped through grease fittings until grease is visible between the two sections around the circumference of the ring. The turret will be rotated five times in both directions and again lubricated until all surfaces on the circumference of the ring are lubricated. Excess grease will be removed from the outside surface of the rail.

d. Mortar Systems with Mount. The entire mortar system will be cleaned with MIL-PRF-680, Type III, petroleum solvent. The surfaces will be dried by wiping with clean, dry rags. Immediately after drying, the system will be preserved as follows:

(1) The entire bore of the mortar tube will be coated with MIL-PRF-3150 preservative oil. All unpainted, exterior surfaces will be coated with MIL-PRF-3150 preservative oil.

(2) The controls of the standard will be extended to the limits of their range and coated with MIL-PRF-3150 preservative oil and returned to their normal position. All unpainted, exterior surfaces will be coated with MIL-PRF-3150 preservative oil.

(3) All unpainted exterior surfaces of the bridge, rotator, and base assemblies will be coated with MIL-PRF-3150 preservative oil.

e. Small Arms. All small arms will be thoroughly cleaned with MIL-PRF-372 (bore cleaner) and subsequently cleaned with MIL-PRF-680, Type III, petroleum solvent. All metallic surfaces of the weapon will be coated with MIL-PRF-3150 or MIL-PRF-63460 CLP preservative oil. Drain excess oil from the weapon, changing draining position as necessary to accomplish thorough draining. If stored in fiberboard or wooden containers, wrap or bag items with MIL-DTL-22020.

f. Installed Fire Control Equipment.

(1) All exposed, unpainted, and metal surfaces not plated will be coated with MIL-PRF-32033 preservative oil.

(2) Sighting assembly springs will be cleaned and coated with a light film of MIL-PRF-32033 preservative oil.

(3) All fire control items that require purging will be charged and purged prior to storage.

g. Non-installed Fire Control Equipment.

(1) Components of fire directions sets will be placed in their respective places in the carrying case.

(2) Aiming circle will be placed in its respective place in the carrying case.

h. Launcher, Grenade. Coat unfinished, unpainted surfaces of launcher tubes with MIL-PRF-3150 preservative oil.

i. M36 Series Machine Gun Mounts.

(1) Non-CH Storage. The unpainted surfaces of the mount and ring will be thoroughly cleaned with MIL-PRF-372 (bore cleaner) and, subsequently, cleaned with MIL-PRF-680, Type III, petroleum solvent. The painted surfaces will be cleaned by wiping with clean, dry rags. Immediately after cleaning, all surfaces will be coated with MIL-PRF-3150 preservation oil. Excess oil will be allowed to drain from the coated surfaces. All sliding surfaces of the ring will be coated with a light coat of GAA. Cover the entire ring and mount with 6 mil black polyethylene film.

(2) CH Storage. Requirements are the same as non-CH storage except that the barrier material can be eliminated.

j. TOW. The 180-day TOW subsystem verification (M2A2ODS) will be performed prior to the vehicle being placed in storage.

k. PATRIOT Missile System. CH storage is required for Phased Array Tracking Radar, Intercept of Target (PATRIOT) Equipment.

(1) Perform PMCS per equipment TMs to include intermediate maintenance (IM) and depot forward tasks.

(2) Store per equipment TMs except:

(a) Equipment shall be stored using the landing legs, NOT the outriggers.

(b) All tires shall be inflated per applicable technical manuals (ref. Chapter 5, Section III, 5.3.d(1).

(c) All louvers, vents, etc., will be opened.

SECTION XI. COMMUNICATIONS AND ELECTRONICS EQUIPMENT

5.11 PRESERVATION PROCEDURES

CAUTION

Water or solvents will not be used to clean electronics equipment or wash the floors within electronics enclosures. Electronics enclosures prepared for CH storage will have all vents, louvers, and so forth, opened to allow free circulation of air within the enclosures. Desiccants are prohibited for use within electronics enclosures except as specified in paragraph b(1) below. Items or equipment marked to indicate susceptibility to electrostatic, electromagnetic, or radioactive forces will remain in their original containers. These containers will be marked to identify contents and special handling requirements.

a. Portable (MANPACK) Radio Sets and Radar Sets. No preservation required. Place this equipment in weather resistant fiberboard boxes, wrap and/or cushion, as required, to prevent loss or damage of components. (Exception: items in cases require no other protection)

NOTE

Remove all dry cell batteries from equipment. Installation Kits (IKs), handsets, headsets, and control boxes will remain in equipment. Mountings, connectors, and attaching hardware will also remain installed on the equipment SINCS Radios will be packaged, preserved, and stored in ISO containers. Finally, the general cleaning requirements cited in chapter 3, section IV, paragraph b(5). will be followed.

b. Communications and electronics shelters.

(1) Non-CH Storage

(a) Wrap all loose spare parts and miscellaneous components with A-A-1051 corrugated paperboard; place the items within ASTM-D5118 weather-resistant fiberboard boxes; close per ASTM-D1974, using ASTM-D5486, Type IV.

(b) Wrap handsets, headsets, microphones, controls, and similar equipment not disassembled and secured to equipment with bubble or foam wrap; place within a plastic bag; tape in place with ASTM-D5486 tape, Type IV.

(c) Secure coil halyards, rope, and other like items with A-A-1451 twine.

(d) Wind each cable or cord assembly (not on reels) into the smallest dimension, tie the coil with A-A-1451 twine. If reels are provided, wind the assemblies on the reels, and secure the connectors with the locking device. If locking devices are not provided, secure with A-A-1451 twine.

(e) Place nuts, bolts, screws, and other hardware in cloth bags and attach to the equipment from which they were removed.

(f) Secure mast sections together with ASTM-D5486, Type IV, tape and secure within the shelter.

(g) Consolidate the ground rods, secure with ASTM-D5486, Type IV, tape and secure within the shelter.

(h) Secure boxed items, equipment, and accessories (ladders, chains, antennas, and brackets) that do not have an assigned location, to the shelter floor.

(i) Close and secure all windows and blackout blinds, shields, louver vents, blower vents, and heating intake doors.

(j) Secure all fastenings, shock mounts, bolts, nuts, screws, and straps of all major and auxiliary units mounted on the floor, shelves, or walls of the shelter. Place and secure all covers over equipment.

(k) Store items within designated compartments of cabinets and drawers to the maximum capacity. Place TM(s) in the receptacle provided for this purpose.

(l) After cabinets and drawers have been filled, remaining items will be stored in boxes as follows: Group like items together, place into ASTM-D5118 weather resistant fiberboard boxes and close per ASTM-D1974 using ASTM-D5486, Type IV, tape. (Identify contents on outside of the box.)

(m) Depending upon available floor space to be utilized, the over packed, overflow items shall be blocked, braced, or secured within the shelter. This will be accomplished in a manner that will not cause damage to other equipment and permit access into the shelter.

(n) For storage of equipment outside shelters, remaining items will be packed and preserved in accordance with MIL-STD-2073-1. Close and secure contents within boxes to prevent movement and damage.

(o) For shelter interior securing, shock-mounted equipment shall float free without blocking and bracing. Utilize integral tie downs to block, brace, secure, and contain the stored load. When built-in tie downs or securing devices are not available, design and construct a blocking and bracing assembly to support and prevent the load from shifting. Fabricate the assemblies using a combination of triple-wall, weather-resistant fiberboard and a wooden support framework. Wood blocks may be used, as required, to supplement the fiberboard fabrication. Cushion wood blocks contacting equipment with A-A-1051 corrugated paperboard or triple-wall material. Loading and packing procedures of the equipment TM shall also be reviewed for specific requirements not covered herein.

(p) Seal all exterior openings and joints (except the door) with tape.

(q) Install a desiccator's breather assembly in the shelter as specified below.

1. Fabricate an adapter panel. Secure gasket to the panel with MMM-A-260 adhesive and apply a coating of adhesive around the blower aperture. Place panel over the aperture, secure with the same screws removed from the blower, and seal with tape. Connect desiccated breather assembly hose to the panel and secure with retainer clamp.

2. Compute the amount of desiccant required for the breather assembly will be based on two units for each cubic foot of volume within the shelter. Static charge amount will be based on 1.6 units for each cubic foot within the shelter. Bulk desiccant for breather assembly will be MIL-D-3716, type II sieve mesh Nos. 6 to 12 grade H. Static charge bagged desiccant shall be MIL-D-3464.

3. Place desiccant in breather assembly and secure cover.

4. Install a plug-type humidity indicator conforming to the adapter panel so it is visible from the outside.

5. The static charge bagged desiccant will be distributed throughout the shelter by suspending the bags 6 to 12 inches above the shelter floor by the use of cord, rope, or wire. Desiccant will not come in contact with installed equipment 6 Breather assembly materials are listed in table 5-4.

Table 5-4. Breather Assembly Materials

Material	Quality	Specification
Drum steel	1	MS27683
Cover for drum	1	MS27683
Locking ring	1	MS27683
Gasket for cover	1	MS27683
Wire cloth 15 3/8"dia.	1	Local purchase, mesh commercial bronze wire
Expanded metal, 15 3/8 dia.	1	ASTM-F1267, type II, class 3/4, No. 16
Steel tubing, .92" seamless as appropriate wall 3" LG x 3" OD	1	ASTM A 512, 513, 519
Tubing, flexible 6' 3" LG	1	Local purchase
Clamps for flexible tubing with 3" ID	2	Local purchase
Pressure sensitive tape 2" W	1 roll	ASTM-D5486, type IV
Desiccant (16-unit bag)	As required	MIL-D-3464
Desiccant bulk,	As required	MIL-D-3716, type HI sieve mesh, Nos. 6 to 12, grade H

6. Breather assembly materials are listed in table 5-4. Breather assembly fabrication will be performed as follows:

(i) Cut a 3-inch hole in the wall of the drum just above the bottom chime. Insert a 3-inch OD steel tube until its entire circumference can be welded to the drum wall;

(ii) Spot weld wire cloth to the expanded metal and position in the drum so the expanded metal will support the wire cloth. Spot weld wire cloth and expanded metal to the wall of the drum at 12 equally spaced points just above the 3-inch steel tube;

(iii) Connect end of the flexible tube to the 3-inch steel tube in the wall of drum and secure with retainer clamp; and cut a 3-inch hole in the center of the drum cover.

7. Adapter panel materials are listed in table 5-5.

8. Place door padlock and keys in a bag. Attach and secure bag in a location readily accessible upon opening the shelter door.

9. Close and secure the shelter door and seal with tape.

10. Inspect at 30 day intervals for condition.

(r) Shelter-Mounted Environmental Control Units-The Environmental Control Unit (ECU) in each shelter require special preparation for storage. Turn the unit off without purging the refrigerant.

Table 5-5. Adapter Panel Materials

Quality	Material	Specification
1	Steel plate, cold-rolled 12"x 12"x1/16"	Fabricate locally
1	Steel tubing, .092"	ASTM-A512, 513, 519 or seamless, wall 6" LG x 3" as appropriate
1	Humidity indicator plug and retainer, insert NSN6685-00-618-1822	SAE AS26862 w/multi-spot
4oz	Adhesive	MMM-A-260

(2) CH storage. Prepare shelters for storage as outlined in paragraph b(1) above except as follows:

(a) All louvers, vents, etc., will be opened to allow free circulation of air within shelters.

(b) Doors, openings, etc., will not be taped.

(c) Desiccator's breather assembly will not be required.

(d) Overflow items will be placed in a suitable container to prevent damage and stored in the same location as the shelter.

c. Shop vans and semi-trailers containing electronic equipment. Prepare vans and semi-trailers for storage, as outlined in paragraph b above.

d. Radar set, mobile. Prepare radar set for storage, as outlined in paragraph b above and as follows:

(1) Non-CH Storage

(a) Prepare radar set for storage, as outlined in paragraph b(1) above and as follows:

1. Place proper amount of MIL-D-3464 desiccant in drawers of each radar set section.

2. Seal section drawers with ASTM-D5486, type IV, tape.

3. Place desiccant inside scanner end bell.

4. Enclose each drawer section of radar set in a MIL-PRF-131, class 1 or 3 bag and close by heat seal. Exhaust all entrapped air from bag prior to final heat seal.

5. Close all drains and vents of the mobile unit.

6. Attach a caution tag to the unit instructing personnel to remove desiccant bag prior to operation.

7. Place and secure the tarpaulin over the unit.

(2) CH storage. Prepare radar set for storage, as outlined in paragraph b(2) above except that desiccant and bag will be omitted.

e. Photographic and night vision equipment

(1) Only CH storage is authorized

(2) Photographic equipment and night vision equipment installed in shelters, vans, or semi-trailers will be prepared for storage, as specified in paragraph d(2) above.

(3) Photographic or projector equipment not installed in shelters, vans, or semi-trailers will be prepared for storage as follows:

(a) Tighten all screws, knobs, and clamps; engage equipment-locking devices.

(b) Coil and secure cord and cable attached to the item with tape.

(c) Place spares, accessories, or tools within the designated spaces provided on the item within the transit case.

(d) Wrap each lens not provided with lens caps with anti-tarnish lens tissue and secure with tape. Place the wrapped lens in a spare parts box or case, when furnished.

(e) Place all equipment with accessories in the accessory bag or transit case. If accessory bags are not available, cushion the items with bubble or foam cushioning material, place the items in an ASTM-D5118 weather- resistant fiberboard box, and close in accordance with ASTM-D1974.

(f) Equipment with fiber bellows will be packed as specified in paragraph 5 above, further placed in a bag fabricated from MIL-PRF-131 material, and sealed.

CAUTION

Desiccant will not be used, as this will cause the bellows to dry out and become unserviceable.

(g) Consolidate the items of each set, place within a weather-resistant fiberboard box, and seal the box with ASTM- D5486, Type IV, tape.

(h) For afloat storage of night vision devices, with storage containers, secure with anti-pilferage seal (5340-00-084- 1570) and regulate IAW security procedures for sensitive and controlled item regulations.

(4) Exceptions to the requirements cited in paragraph (b) above are self-contained equipment in housings or cases. This equipment does not require over packaging and may be stored in the case.

f. Installed tactical AM/FM radio and radio teletypewriter systems. This equipment is only authorized for CH storage.. Mountings, connectors, and equipment hardware not removed from the vehicle will be placed within MIL-PRF-131 bags or protected by placing the MIL-PRF-131 barrier material over and around the units, taping it to the surrounding area with ASTM- D5486, Type IV, tape.

(1) Installation kits, accessory kits, intercom sets, control boxes, mountings, matching units, will be stored on the respective vehicle, as required.

(2) Wrap, cushion, secure, and/or protect, as required, loose items to prevent loss or damage.

(3) All cables, connectors, will be connected to their appropriate components to maintain equipment integrity. Handsets, headsets, will be protected from dust by enclosing them in plastic bags. They will remain connected and secured to the equipment.

(4) Store equipment in its original unit packs when available. Additional packaging is unnecessary.

(5) Antenna elements and top sections, when removed, will be taped or tied together to secure individual pieces. All elements and sections shall be taped in a manner that will prevent entry of moisture and dust.

(6) Install or replace dust covers over the equipment, when available.

g. Miscellaneous electrical and electronic equipment. This equipment is only authorized for CH storage.. Equipment not installed or uploaded will generally be prepared for storage, as outlined in this section and as follows:

(1) Handsets, headsets, connectors, microphones, electrical assemblies, or components, will be cushioned with bubble or foam cushioning material, secured with ASTM-D5486, Type IV, tape, placed within ASTM- D5118 weather-resistant fiberboard boxes, closed per ASTM-D1974, and secured with the same tape.

(2) Heavy or delicate items (over 5 lbs.) will be individually protected and packaged, as specified in paragraph f (a) above.

(3) Equipment in cases or housings will not require packaging.

(4) Equipment in original packaging will not require over packing; therefore, equipment shall not be removed from its original packaging. Small components or assemblies (5 lbs. or less) shall be protected, as required, and consolidated in fiberboard boxes to prevent loss, damage, or theft.

h. Wire, cable, and cord assemblies. This equipment is only authorized for CH storage. Replace connector caps. If caps are not available, insert connectors in a plastic bag. Secure bag to cable with ASTM-D5486, Type IV, tape. Wind assembly uniformly on the reel. Secure connectors to the reel with locking devices provided. If the reel is not equipped with locking devices, secure connectors to the reel with A-A-1451 twine. Protect the contents of the reels with original lagging overprotective covers. If not available, over wrap between the reel flanges with weather-resistant

corrugated fiberboard of sufficient width to extend the full distance between the reel flanges and sufficient length to overlap the ends by at least 6 inches. Secure over wrap with flat steel strapping or tape.

i. Kits: hardware, installation, modification, and tool. This equipment is only authorized for CH storage. Kits not installed or uploaded on equipment will be visually inspected, cleaned, and protected, as required, and returned to original containers or cases/tool boxes, when provided.

j. Electronic test, measurement, and diagnostic equipment (TMDE). This equipment is only authorized for CH storage.

(1) Each item of TMDE will be inspected, cleaned, returned to carrying/transit case, and secured. Ensure that all spare parts or ancillary items are secured within their respective compartments within the case.

(2) For special requirements not provided above, refer to equipment TM. If desiccant is required, fold in or wrap with paper to preclude direct contact with the instruments.

k. Trailer-mounted and hand-held reeling machines. This equipment is only authorized for CH storage.

(1) Trailer-mounted reeling machine.

(a) Both the trailer chassis and the reeling machine will be prepared for storage using the applicable requirements of this chapter or equipment TM for specific guidance.

(b) Secure all loose components to preclude loss or damage.

(c) Wrap, cushion, and place the running spares and tools within a close-fitting fiberboard box, when furnished.

(d) Replace the equipment cover and secure in place.

(2) Hand-held reeling machine. Hand-held reeling machines require no special packaging requirements. Store equipment in its original packaging when available or place the item within a close-fitting ASTM-D5118 weather-resistant fiberboard box, closed per ASTM-D1974, and secure with ASTM-D5486, Type IV, tape.

l. Antenna groups and masts.

(1) Non-CH Storage. Prepare for storage using the requirements cited in the equipment TMs.

(2) CH Storage. Towers uploaded on vehicles require no special storage processing except to apply spot painting, as required. Critical surfaces will be coated with MIL-PRF-32033 preservative oil.

m. Searchlight, infrared series. This equipment is only authorized for CH storage.

(1) Searchlight assemblies uploaded on vehicles require no special storage processing except spot painting. Critical surfaces will be coated with MIL-PRF-32033 preservative oil.

(2) Equipment not installed or uploaded in vehicles will be visually inspected, cleaned, protected, as required, and returned to the proper receptacles within storage/transit cases.

n. Loudspeakers, digital security equipment, telephone sets, radio sets, and communications terminals. This equipment is only authorized for CH storage.

(1) Equipment uploaded on vehicles requires no special storage processing except to return and secure all equipment and components to the proper receptacles within their respective storage/transit cases.

(2) Equipment not installed or uploaded in vehicles will be visually inspected, cleaned, protected, as required, and returned to the proper receptacles within storage transit cases.

(3) Equipment for which no transit case is available shall be wrapped with bubble or foam cushioning material, and placed within ASTM-D5118 weather-resistant fiberboard boxes and taped shut with ASTM-D5486 tape.

o. Spare and repair parts. This equipment is only authorized for CH storage. All spares/repair parts shall be stored in accordance with their individual Special Packaging Instructions (SPI) or MIL-STD-2073-1 if a SPI is not available. Smaller items (5 lbs. or less), unit packed as specified, shall be consolidated in fiberboard boxes to prevent loss, damage, or theft.

SECTION XII. SUPPORT EQUIPMENT

NOTE

Uploading or partial uploading is authorized; however, unpacking and de-preserving equipment for storage shall not delay or cause an undue burden upon storage personnel during handoff.

5.12 DETAILED PRESERVATION REQUIREMENTS

a. Mine Detection Set

(1) Non-CH storage

(a) The preservation for the mine detecting set shall be as follows: Components that make up a complete detecting set shall be placed within the case as provided for. The case shall be closed and secured by the attached clasps. A minimum of two tamperproof seals shall be attached to the clasps in a manner that the case cannot be opened without destroying the seals.

(b) Each mine detecting set shall be individually packed in a close-fitting box conforming to ASTM-D6251, overseas type, style optional. Blocking and cushioning shall be used as necessary to prevent movement of contents within the shipping container.

(2) CH storage. The mine detecting set requirement will be the same as for non-CH storage except each detecting set shall be individually packed in a close-fitting box conforming to ASTM-D5118. Closure shall be in accordance with ASTM- D1974. The packed detecting sets shall be palletized. The pallets shall conform to ASME MH1, Part Number MH1/9- 02SW4048. Load arrangement shall conform to load pattern 3, Appendix B, of MIL-STD-147. The height of the pallet including the load shall not exceed 43 inches. The detecting sets shall be secured to the pallet with a total of five primary and secondary straps. Straps shall conform to ASTM-D3953, type I or IV, finish A.

b. Kitchen, field feeding, company level.

(1) Non-CH Storage

(a) The component parts of each complete field kitchen shall be cleaned and preserved in accordance with MIL-PRF-44156. Apply preservative to unpainted or uncoated metal surfaces only. Greaseproof barrier material shall conform to MIL-PRF-121. Secure barrier material with paper tape conforming to ASTM-D5486 tape. Seal openings with tape conforming to ASTM-D5486.

(b) Each complete field kitchen shall be packed in a two-box unit. Each box shall be constructed in accordance with style DBLCC. The approximate outside dimensions shall be 48 inches in length, 40 inches in width, and 43 inches in depth. Each box shall be mounted on a type I (4-way entry), type IV or type V pallet in accordance with MIL-STD-147. Box 1 of two shall contain heater cabinet, pot cradle, two food containers, water bag, cutting board, fire extinguisher, lantern, tool chest, and M2A burners. Box 2 of two shall contain all remaining components. The contents of each box shall be cushioned, anchored, braced, and blocked as necessary to prevent movement and damage. Cover the kitchen field with a canvas tarp or waterproof cover.

(2) CH storage. The field kitchen requirement will be the same as for non-CH storage except the canvas tarp or waterproof cover are not required.

c. Light Set.

(1) Non-CH storage

(a) The methods, preservatives and their application shall be in accordance with MIL-STD-2073-1.

(b) Climber's set, hammer, pliers, reeling machine and screwdrivers shall be preserved by method 20. Apply MIL- PRF-16173, grade 1, preservative to ferrous metal surfaces. Climber's sets and reeling machines shall be individually packaged in boxes conforming to ASTM-D5118, class weather resistant.

(c) The reflectors shall be packaged by method 10 in quantities of 80 each, using a box conforming to ASTM-D5118, class weather resistant. Reflectors shall be nested with a non-corrosive paper between each reflector.

(d) Cable, tube, and wire. Each item shall be packaged by method 10. Individual coils, reels or spools shall be packaged in boxes conforming to ASTM-D5118, class weather-resistant. Tape conforming to ASTM-D5486 shall be used to secure the barrier material.

(e) All other components shall be packaged by method 10 in weather resistant containers conforming to ASTM- D5118 or ASTM-D5168, Class CGWR. Items preserved and packaged as specified above weighing less than approximately 40 pounds per package shall be intermediate packaged in boxes conforming to ASTM-D6251, Class 1.

(f) The packing for the light set shall be as follows: Each complete set shall be packed in a crate conforming to ASTM D7478/D7478M, style a, class optional.

(2) CH Storage. The light set requirement will be the same as for non-CH storage except each complete set shall be packed in a covered crate conforming to ASTM- D6039/-D6039 M.

d. Refrigeration unit.

(1) Non-CH Storage.

(a) All exposed, uncoated, unpainted, ferrous metal surfaces shall be clean and thoroughly dry exposed, uncoated, unpainted, ferrous metal surfaces..

(b) Non-contacting ferrous metal surfaces (surfaces that do not contact other surfaces in operation) of the unit, shall be coated with MIL-PRF-16173, grade 1, preservative. Ferrous metal contacting surfaces (surfaces that contact other surfaces in operation), except shafts and pulleys, of the unit shall be coated with MIL-C-11796, class 3, preservative.

(c) The refrigeration charge shall be pumped down and all hand valves closed and capped. Closed valves shall be tagged or otherwise clearly marked with instructions for restoring to service. Warning tags shall be prominently affixed to the controls and shall caution against operating the unit without opening valves. Oil and refrigerant shall not be removed from the system.

(d) The diesel engine shall be preserved in accordance with TACOM ATPD 2232.

(e) Exposed, uncoated, ferrous metal surfaces of shafts and sheaves shall be coated with compound conforming to A-A-52465. All mounted belts shall be relieved of tension.

(f) All openings into the electric motor, switches, and control boxes, and faces of gauges, meters, thermostats, indicators, et cetera, shall be sealed or covered with tape conforming to type III or IV of ASTM-D5486.

(g) The battery leads shall be disconnected and terminals taped. The battery hold-down clamps shall be coated with MIL-C-11796, class 3 or MIL-PRF-16173, grade 2 preservative. The electrolyte shall be unit packed in accordance with O-S-801.

(h) Each refrigeration unit shall be packed in a cleated plywood box conforming to overseas type, style B, type 3 load of ASTM-D6251. The electrolyte shall be blocked and braced or anchored and the container closed and strapped. Each box shall be provided with a fully sheathed skid base. The sheathing for the base shall be as specified for the sides, except that the plywood box shall be strapped with a minimum of 3/4 by 0.023 inch steel strapping conforming to type I of ASTM-D3953.

(i) Special handling marking requirements applicable to arrows and the words "This Side Up" shall apply.

(2) CH storage. The refrigeration unit requirement will be the same as for non-CH storage except the ASTM-D6251 shall be domestic type.

e. Surveying set, electronic distance measuring equipment (SEDME).

(1) Non-CH storage.

(a) All components for which cases are provided shall be placed in their respective cases and the case lids closed and secured. The case containing the SEDME equipment system shall have desiccant placed within the case. The desiccant shall conform to MIL-D-3464 and shall be in accordance with the formula specified in MIL-STD-2073-1. The components shall be placed in the transport case and the case lid closed and secured. Components such as the tripod, for which cases are not provided, shall be placed in close fitting boxes conforming to ASTM-D5118, W5c, style optional. The box containing the tripod shall have a fitted block of wood secured in the end of the box to prevent the tripod legs from puncturing the box. Each box shall be closed and secured in accordance with ASTM-D1974.

(b) The packing of the surveying set will be as follows: The components that make up a complete SEDME equipment system, including those in carrying cases, shall be packed together in a close-fitting box conforming to ASTM-D6251, overseas type, grade B, style optional. The contents shall be blocked or braced within the box in a manner to prevent movement or damage. The box closure shall be in accordance with ASTM-D1974. Strapping shall conform to ASTM- D3953, class 1, type I or IV, finish B, size as applicable.

(2) CH storage. The surveying set requirement will be the same as for non-CH storage except boxes shall be domestic type and strapping shall be finish A.

f. Expandable shelter

(1) Non-CH Storage

(a) All hardware necessary for erection and operation of the shelter shall be secured within the shelter. The equipment container shall be securely fastened with tie down straps to the fixed floor. The parts in the equipment container and in the shelter shall be secured and padded, as required, to ensure that no damage shall occur to the parts, the equipment container, or the shelter. All exterior electrical connections shall be covered and all expandable mechanisms shall be secured.

(b) The shelter shall be closed into its container mode and secured by means provided. Mechanical seals shall be placed on the doors to deter unauthorized entry to the shelter.

(2) CH storage. The shelter requirement will be the same as for non-CH storage. USAMMA managed facilities have shelters expanded for COSIS on installed medical equipment.

g. Clam Shelter

(1) Non-CH Storage

(a) Each Clam shelter will be packed in six reusable wooden crates with skids, approximately 12'8" x 4' x 4', sufficiently strong to withstand stacking, and shall not exceed 4,600 lbs. per crate. Lights and electrical systems shall be packed in fiberboard boxes. Fabrics shall be folded and stacked. The technical manual shall be packed so it is easily accessible upon opening number 1 crate. All components shall be blocked, braced, or cushioned, as necessary, to prevent damage.

(b) The following special markings shall be included: All interior packaging and unpacked items shall be marked or tapped with part number (if applicable), nomenclature, and quantities. Marking shall match an enclosed packing list of items contained in each crate and the component manual.

(2) CH Storage. Requirements for CH storage are the same as for non-CH storage.

h. Tool outfit, pioneer, portable

(1) Non-CH Storage

(a) Preservatives specified shall be applied in accordance with MIL-STD-2073-1. Unfinished surfaces shall be coated with MIL-PRF-16173, grade I or grade 4, preservative. Exposed exterior machined surfaces shall be coated with MIL-C-11796, class 3, or MIL-PRF-10924 preservative. The coated surfaces shall be wrapped or covered with barrier material conforming to MIL-PRF-121, type I, and secured in place with tape. Protected items having mounting brackets or holders shall be preserved as specified and when possible placed in the case.

(b) The trailer components shall be preserved in accordance with level A (mobile) requirement of MIL-STD-3003. Preserve the hand tools, accessories and other items in accordance with method 10 of MIL-STD-2073-1.

(c) Interiors of padlocks shall be coated with MIL-PRF-32033 and operated to assure penetration of the lubricant. Preserve unattached padlocks and keys in accordance with MIL-STD-2073- 1, method 33 or 31 and secure within the body assembly. Attached padlocks shall be additionally protected by a wrap of barrier material conforming to MIL-PRF-121, type I, and the wrap secured with tape. For the fire extinguisher, exterior metal surfaces requiring the application of a contact preservative in accordance with MIL-STD-2073-1 shall be coated with MIL-PRF-16173, grade 1, preservative. The extinguisher shall be placed in the mounting bracket and secured.

(d) The preserved and unpreserved components and items of equipment shall be placed and secured within the body assembly utilizing the mounting. Components and items of equipment that cannot be secured by the mountings provided, because of the preservation requirement, shall be consolidated in boxes conforming to ASTM-D5118, W5c. When level 2 equipment is procured, the fenders shall not be installed. The fender mounting hardware and the body to trailer mounting hardware shall be placed in a close fitting box conforming to ASTM-D5118, W5c.

(e) The packing for the tool outfit shall be as follows: When level 1 equipment is procured, each complete trailer- mounted tool outfit, shall be prepared for unboxed mobile shipment in a manner that ensures carrier acceptance and safe delivery to destination. When level 2 equipment is procured, each complete body assembly shall be packed in a box conforming to ASTM D6256/D6256M, type II, style optional, class 2, with rubbing strips and plywood superstructure.

(2) CH storage. The tool outfit requirement will be the same as for non-CH storage, except when level 2 equipment is procured the boxes shall be type 1 for domestic shipment.

i. Container, refrigerated

(1) Non-CH Storage

(a) When a plywood cover plate is furnished in lieu of the refrigeration unit, it shall be installed over the refrigeration unit opening.

(b) Fuel tanks fabricated from material requiring the application of a preservative in accordance with the criteria of MIL-STD-2073-1 shall be filled with preservative oil conforming to Type I or Type II, grade 30 of MIL-PRF-21260. The oil shall then be completely drained into a recovery container. Any removed drain plugs shall be coated with the preservative oil specified and reinstalled. The fuel line fitting cap shall be installed on the fuel line.

(c) The bare end of the cable shall be wrapped with tape conforming to ASTM-D5486. The connector shall be covered with a protective cap or by wrapping the tape. The interior surfaces of the exhaust lines shall be atomized sprayed with oil conforming to MIL-PRF-21260, Type I or II, grade 30. Rain caps shall be secured to prevent opening using tape conforming to ASTM-D5486. The glass face of the recorder shall be protected with a piece of plywood placed over and completely covering the glass area. The plywood shall be held in place with tape conforming to ASTM-D5486. The recorder charts shall be preserved in accordance with MIL-STD-2073-1, method 33 or 31 and secured inside the container.

(d) The generator set when furnished shall be preserved in accordance with Level A requirements, except that instead of bolting to a shipping container base, the generator set shall be bolted through the barrier material to the refrigerated container floor frame with the fasteners provided. A cover shall be provided consisting of ends, sides and top constructed in accordance with ASTM-D6251 for an overseas type, style I box.

(e) The refrigeration unit when furnished shall be preserved with MIL-PRF-16173, grade 2, or MIL-C-11796, class 3. The exterior portion of the refrigeration unit shall be completely covered with a shroud made from material conforming A- A-3174. The shroud shall be sealed to the container around the unit with tape conforming to ASTM-D5486.

(f) The refrigerated container shall not require over packing.

(2) CH storage. The refrigerated container will be the same as for non-CH storage except the generator sets shall be preserved in accordance with Level B requirements and the generator covers shall be fabricated as specified for domestic type box.

j. Trailer mounted field kitchen

(1) Non-CH Storage

(a) The components and equipment of the kitchen shall be packed in the center aisle and arranged and secured at the option of the packer. The components and equipment of the kitchen shall be adequately protected and secured to prevent damage. Tape the slack lift loops on each side of the trailer tongue with 2-inch minimum width tape conforming to type IV of ASTM-D5486.

(2) CH storage. The trailer mounted kitchen field requirement will be the same as for non-CH storage.

k. Reproduction set

(1) Non-CH Storage

(a) All the components of each reproduction set shall be placed into proper carrying cases or boxes. Cushioning shall be used to prevent movement or damage. Close the box or case.

(b) Each complete reproduction kit shall be packed in a cleated-plywood shipping container conforming to overseas type, style A of ASTM-D6251. Cushioning shall be used to fill voids within the shipping container and prevent movement or damage of contents. Each shipping container shall be closed and strapped in accordance with ASTM-D6251.

(2) CH storage. Requirements for CH storage are the same as for non-CH storage.

l. Spray outfit

(1) Non-CH Storage

(a) It is recommended that the paint spray outfits be packed in a manner duplicating the original packing when received in new condition. Drain gasoline or run gasoline tank dry; spray inside of gasoline tank with MIL-PRF-21260 preservative, type 1, grade 10. Drain and refill engine and compressor crankcase with MIL-PRF-21260 preservative, type I, grade 10. Attach a tag on both engine and compressor indicating, "Crankcase is filled with MIL-PRF-21260 preservative, drain and refill with approved oil before operating."

(b) High humidity and rainy weather condition can cause deterioration of exposed metal parts. Make every effort to protect the paint spray outfit from the elements. If the paint spray outfit is not to be used for a period of time, protect it by covering with a tarpaulin. Keep gasoline tank full. Remove and clean fuel filter bowel daily. Lubricate wheel bearings more frequently than normal. The spray outfit component such as tanks, spray guns, hoses, extension, cups and respirators, shall be packaged in the chest provided.

(2) CH storage. Same as for non-CH storage except the high humidity and rainy weather condition are not applicable.

m. Target set, surveying.

(1) Non-CH Storage

(a) All metal surfaces of the instruments shall be cleaned and dried in accordance with MIL-STD-2073-1. Lens and mirror surfaces shall be cleaned with tissue paper conforming to A-A-50177, type I. The unprotected surfaces of instruments and accessories, except those instruments and accessories preserved by method 50 requiring a contact preservative in accordance with MIL-STD-2073-1, shall be coated with a thin film of MIL-PRF-3150. The preservative shall be applied by brushing or wiping. Care shall be exercised to prevent the preservative from contacting lenses, mirrors, instrument finishes, or nonmetallic surfaces. Wrap preserved surfaces with barrier material conforming to MIL-PRF-121 and secure with tape conforming to ASTM-D5486.

(b) Each battery and lighting accessory case with all accessories contained within the case shall be preserved by method 10. The container shall be a box conforming to ASTM-D5118, W5c, or V3c. The box shall be waterproof sealed with tape in accordance with ASTM-D1974.

(c) Each tribrach with optical plummet and base plate and technical publications shall be preserved in accordance with MIL-STD-2073-1, method 42. The inner container shall be the carrying case. The outer container shall be a close- fitting box, class domestic SW, grade 125, conforming to ASTM-D5118.

(d) Pack Target sets closely together in ASTM-D6251, overseas type, style optional boxes and secured with ASTM-D3953, class I, or IV straps.

(2) CH storage. The target set requirement will be the same as for non-CH storage except that boxes shall be domestic type and strapping shall be finish A.

n. Survey set, artillery fire control.

(1) Non-CH Storage

(a) Cleaning and drying shall be in accordance with MIL- STD-2073-1. Preservative shall not contact lenses, mirrors, instrument finish, or nonmetallic surfaces. Wrap preserved surfaces with barrier material conforming to MIL-PRF-121. Exposed threads and exposed metal surfaces of instruments, parts and accessories requiring a contact with MIL-PRF-3150 preservative. Each item in the vendor's container, when furnished, shall be preserved by method 33, when necessary to prevent damage from folding or flexing.

(b) The remaining components such as arrow sets, target lights, plumb bobs, range poles, tension handles, and tripods shall be preserved as follow: Each item shall be preserved by method III in a close-fitting box conforming to ASTM-D5118,W5c.

(c) Set components shall be consolidated packaged in the chest in accordance with the chest loading plan where space permits. Consolidate components that cannot be secured within the mountings due to the applied preservatives and secure them in boxes conforming to ASTM-D5118, W5c. Cushioning and blocking shall be provided to control movement of components within the chest or boxes.

(d) The chest and other components of each complete surveying set shall be packed together in a close-fitting box conforming to ASTM-D6251, overseas type, style optional. Strapping shall be zinc coated and shall be placed adjacent to the box skids.

(2) CH storage. The surveying set requirement will be the same as for non-CH storage except the boxes shall be domestic type and strapping need not be zinc coated.

o. Theodolite, survey.

(1) Non-CH storage

(a) The rigid metal hermetically sealed case with the desiccant inside shall not require additional preservation, except that when a transport case is furnished, the theodolite shall be placed in the transport case.

(b) If the case is not hermetically sealed, each case containing the theodolite, tools, accessories, and technical publications shall be preserved in accordance with MIL-STD-2073-1, method 52, using the case as the inner container and a close-fitting box conforming to ASTM-D5118, V3c, style optional, as the outer container. The box shall be waterproof sealed with tape in accordance with ASTM-D1974.

(c) Each battery and lighting accessory case with all accessories contained within the case shall be preserved by method 10. The container shall be a box conforming to ASTM-D5118, W5c or V3c, as applicable to the weight of the case, style optional. The box shall be waterproof sealed with tape in accordance with ASTM-D1974, method V closure.

(d) Each theodolite, with accessories as specified shall be packed in a close-fitting box conforming to ASTM-D6251, overseas type, style A or B. Consolidate method 33 preserved accessories and pack in a ASTM-D5118, style optional, box prior to packing them with each theodolite. The components shall be blocked braced and cushioned within the box. The theodolite shall be completely isolated from the box sides, ends, top and bottom.

(2) CH storage. The survey theodolite requirement will be the same as for non-CH storage except the boxes shall conform to ASTM-D6251, domestic type.

p. Shop vans and non-ISO shelters.

(1) Non-CH Storage

(a) Inventory and order/replace missing or damaged items.

(b) Secure tools and equipment in drawers, cases, or appropriate racks in their ship van, and cushion as necessary. Place remaining tools and equipment in fiberboard boxes, ASTM-D5118, class weather resistant, and cushion to prevent damage. Block and brace boxes to prevent movement within a van or shelter.

(c) Cover electrical connectors with approved caps or cover with MIL-PRF-121, , barrier material secured with ASTM-D5486, type IV, tape.

(d) Seal technical manuals in water vapor proof plastic bags and store in designated receptacles or ASTM-D5118, class weather resistant, fiberboard boxes.

(e) Coat bare metal surfaces with MIL-PRF-21260, PE 15-40, preservative oil.

(f) Install a desiccator's breather assembly (see Para 5-11b(l) (q)).

(g) Close, secure, and seal door with tape conforming to ASTM-D5486, type IV, tape.

(h) Close and lock doors. Wrap padlocks with MIL-PRF-121, barrier material secured with ASTM-D5486, type IV, tape. Secure keys per local procedures.

(2) CH Storage

(a) Prepare as above except do not install a desiccator's breather assembly and tape doors.

(b) Open shelter vents and drains just prior to placing in storage to permit air flow.

q. Decontamination apparatus, power-driven M12A1.

(1) Non-CH storage. Tank Unit.

(a) Spray a thin layer of preservative into the interior of the tank in accordance with MIL-C-10382.

(b) Coat the valve threads, thumbscrew threads and hose fittings with preservative MIL-PRF-3150, MIL-PRF-21260 or MIL-PRF-10924 oil.

(c) Install the loading hopper

(d) Install the foot valve assembly in its holding clamp.

1. Strap or wire the valve to the valve assembly.

(e) Secure holding clamp with the thumbscrew.

1. Torque the two hold down bolts to 10 foot-pounds.

(f) Drain and dry all hoses.

(g) Cover all valve and hose openings with either plastic caps/plugs or with MIL-PRF-121, barrier material.

(h) Coil both the suction hose and the hose assembly P/N 5-59-317.

1. Secure hoses with Type V, ASTM- D5486 tape.

(i) Stow the hose assembly within the hopper assembly.

(j) Cover the loading hopper.

1. Limit compression of the gasket between the hopper flange and tank and between the cover flange and hopper flange to 33 percent of its total thickness with suitable spacers or stops.

(k) Place the suction hose within the holding brackets on top of the tank unit.

1. Secure the hose to the tank using steel strapping or wire with solid fiberboard material between the strap and hose and the strap and tank unit contact points.

(2) CH storage. Same as for non-CH storage.

r. Bakery Equipment

(1) Non-CH Storage

(a) Clean and sanitize the interior surfaces of the mixer, divider, and molder, including the dough troughs, with one pouch of disinfectant (food service) dissolved in 1 gallon of water. Rinse with clear water and dry with dry compressed air.

(b) Interior surfaces of mixer, including interior surfaces of dough troughs, dough divider, and molder surfaces, which come in contact with dough, will be coated with MIL-C-10382 corrosion preventive compound (food handling machinery and equipment).

(c) Fog the combination chamber, exhaust tube, exhaust pipe, burner nozzle, and shutter assembly with MIL-PRF- 21260, PE 15-40, preservative oil. Seal all openings with MIL-PRF-121, barrier material and secure with ASTM-D5486, type IV, tape.

(2) CH storage. No further processing is required after cleaning, as specified in paragraph (1) (a) above.

s. Heaters, duct-type, portable.

(1) Non-CH storage. Exposed ferrous metal surfaces shall be covered with MIL-PRF-21260, grade PE 15-40 preservative. Preserved surfaces contacting other surfaces are to be covered or wrapped with MIL-PRF-121 barrier secured with ASTM-D5486, type IV, tape. Seal all openings with approved covers or MIL-PRF-121 barrier material secured with ASTM-D5486, type IV, tape.

(2) CH storage. No preservative required.

t. Bath Units

(1) Non-CH storage. Fog combustion chamber, exhaust tubes, exhaust pipe, and burner nozzles with MIL-PRF-21260, grade PE 10 preservative. Seal blower assembly and exhaust port with MIL-PRF-121, barrier material secured with ASTM-D5486, type IV, tape. Seal openings in shower stands and shower heads with MIL-PRF-121, barrier material, secured with ASTM-D5486, grade IV, tape.

(2) CH storage. No preservation required.

u. Laundry Units

(1) Non-CH storage. Coat all bare ferrous metal surfaces that do not contact other surfaces in operation with MIL-PRF-16173, GR 1 preservative. Surfaces contacting each other in operation will be coated with MIL-PRF-10924 grease. All openings into and around electric motors, switches, outlets, access doors, air vents, timers, shell doors, control panels, etc., will be sealed with MIL-PRF-121 barrier material, sealed with ASTM-D5486, type IV, tape.

(2) CH storage. No preservation required.

v. Outboard motors and gasoline engine driven chain saws.

(1) Non-CH storage. With the engine running smoothly at three-fourths open throttle speed, spray MIL-PRF-21260, grade PE 15-40 preservative into the carburetor throat until the engine chokes to a stop. Drain fuel tank on chain saws. Place item in carrying case and seal with ASTM-D5486, type IV, tape.

(2) CH Storage. No preservation required.

w. Topographic, reproduction, and surveying equipment.

(1) Non-CH storage. Not applicable.

(2) CH storage. Instruments will be placed in their respective carrying cases. No preservative required.

x. Air conditioner A/E32C-39.

(1) Non-CH Storage

(a) The air conditioner shall be preserved and packaged in accordance with method 53 of MIL-STD-2073-1, water vapor proof enclosure, with desiccant. Heat sealed bag shall conform to MIL-DTL-117.

(b) The air conditioner, preserved and packaged per method 53 in accordance with MIL-STD-2073-1 shall be packed in overseas-type containers conforming to ASTM-D6251, wood box. The air conditioner shall be cushioned, anchored, blocked and braced. Skids shall be provided to facilitate machine handling.

(2) CH Storage. The air conditioner requirement will be the same as for non-CH storage except the container shall be of the domestic type of ASTM-D6251.

y. Cargo Container

(1) Non-CH storage. Preservation and packing is not applicable for ISO cargo containers.

(2) CH Storage. Preservation and packing is not applicable.

z. Refrigerators, prefabricated, panel type, walk-in.

(1) Non-CH storage. The door hinges and latches are the only parts of the refrigerator, which require lubrication. Use a low viscosity SAE oil on these parts once a month. Empty refrigerator completely. Disconnect the external power supply. Disconnect the refrigerator panels. The thermometer and light bulb and globe shall be detached from the panel and packed in a fiberboard box conforming to ASTM-D5118. No packing required.

(2) CH storage. Same as for non-CH storage.

aa. Mats, landing, aluminum.

(1) Non-CH Storage

(a) No preservation is required. TYPE I -Twenty-four mats shall be stacked one on top of the other on a pallet. Twenty-five locking bars shall be assembled with the mats and taped in place. The pack shall be secured by strapping. TYPE II - Thirty-two mats shall be assembled with 33 locking bars and stacked in two adjacent stacks, 16 high each, taped and strapped as type I. TYPE III - Sixteen mats shall be assembled with required locking bars and packed as for type II.

(b) Components such as starting connectors (15 ea), turn adapters (15 ea), access adapters (75 ea), anchor attachments (375 ea) and edge anchors (760 ea) shall be packed in boxes conforming to ASTM-D6251, overseas type. The boxed components shall be unitized in a crate conforming to ASTM D7478.

(2) CH storage. Same as for non-CH storage, except boxes shall be domestic type.

bb. Alarm Chemical Agent, Automatic M22.

(1) Non-CH Storage. The Alarm, Chemical Agent, Automatic: Portable Man Pack, M8A1 shall be unit packed in accordance with its SPI P5-15-8800. The M8A1 can suffer from contamination when exposed to an uncontrolled environment. Do not remove the system from its packaging unless necessary or upon issue. Avoid long-term storage in high temperatures. The M8A1 contains a low-level radioactive source, which is NRC licensed by TACOM, reference paragraph 3.2(4) (d).

(2) CH storage. Same as for non-CH storage.

cc. Alarm, Chemical Agent Monitor System

(1) Non-CH Storage. The Chemical Agent Monitor System shall be unit packed in accordance with its SPI P5-15-17100. The Chemical Agent Monitor can suffer from contamination when exposed to an uncontrolled environment. Do not remove the system from its packaging unless necessary or upon issue. Avoid long- term storage in high temperatures. The M8A1 contains a low-level radioactive source, which is NRC licensed by TACOM, reference paragraph 3.2(4) (d).

(2) CH storage. Same as for non-CH storage.

dd. M56/M58 smoke generators, NSNs 1040-01-380-1400 and 1040-01-413-8332 respectively, will have their next inspection dates extended to the month and year the vessel scheduled to be uploaded with the materiel is due back in for a maintenance cycle, and will be remarked by AFSBn-Charleston or Defense Depot Albany Georgia (DDAG). Once aboard vessel, this materiel shall be stored in the temperature and humidity controlled cargo hull of the vessel.

ee. Operational Projects Stock.

(1) Inland Petroleum Distribution System (IPDS). There is an approved IPDS Packing, Packaging, Preservation, and Marking manual (PPPM) and an approved IPDS COSIS manual. The COSIS manual, which includes detailed Storage Serviceability Standards (SSS) that provide the SL codes assigned, detailed instructions for performing the COSIS inspections and exercises prescribed for the item(s) named in the SSS. The COSIS procedures also provide the frequency that COSIS shall be performed based on the storage location in APS-5, APS-4, APS-3(Land Storage at Sierra Army Depot) or APS-1. The IPDS PPPM manual was developed to provide protection against physical deterioration or damage, make the COSIS easier to perform, enhance material identification, and provide an efficient and economical method of packing the equipment for the IPDS. These plans contain complete preservation, packaging, packing, and marking requirements for the IPDS materials and equipment. The descriptions and dimensions of the containers utilized, the required blocking and bracing, contents of each container, gross weights of each container, and the interior/exterior identification markings of each container. In the event that a conflict exists between the PPPM or COSIS manual procedures and an approved commercial or approved technical manual for any of the individual components of the IPDS sets, the PPPM and or COSIS manual procedures shall take precedence over the approved commercial or approved technical manual. Other Army Regulations, Field Manuals, Military Handbooks, and Military Specifications may be referenced for individual items, assemblies, or actions that are applicable to IPDS. Each of the references below apply to the current edition, unless otherwise specified. (Due to numerous reorganization efforts, the guidance in some of the references may have been or will be reissued in other publications. It may be necessary to consult a functional area expert to determine the most recent guidance).

(a) Army Regulations

1. AR 70-1, ARMY ACQUISITION POLICY AND PROCEDURES

2. AR 70-47,ENGINEERING FOR TRANSPORTABILITY PROGRAM

3. AR 385-10, THE ARMY SAFETY PROGRAM

4. AR700-15, PACKAGING OF MATERIEL

5. AR 700-48, MANAGEMENT OF EQUIPMENT CONTAMINATED WITH DEPLETED URANIUM OR RADIOACTIVE COMMODITIES

6. AR710-1, CENTRALIZED INVENTORY MANAGEMENT OF THE ARMY SUPPLY SYSTEM

7. AR 710-3, INVENTORY MANAGEMENT ASSET AND TRANSACTION REPORTING SYSTEM

8. AR 740-3, STOCK READINESS

(b) Military Handbook

1. MIL-HDBK-138B, Guide to Container Inspection for Commercial and Military Intermodal Containers Military Standards

2. MIL-STD-129, Marking for Shipment and Storage

3. MIL-STD-130 Identification Marking of U.S. Military Property

4. MIL-STD-209, Slinging and Tie-down Provisions for Lifting and Tying-down Mil Equipment

5. MIL-C-1660A, Ammunition Unit Loads

6. MIL-STD-1366, Transportability Criteria

7. MIL-STD-1791, Designing for Internal Aerial Delivery in Fixed Wing Aircraft

8. (MIL-STD-1367, Packaging, Handling, Storage, and Transportability Program Requirements, has been cancelled with no superseding document).

(c) Military Specifications

1. A-A-52032 Container, Cargo, End Opening. (MIL-DTL-28689 Containers, Shipping and Storage, Steel Wall (w/wo Cabinetry), and MIL-C-29449 Container Connector, Horizontal (Connector) have been cancelled with no superseding documents. MIL-C-104, Crates, Wood, Lumber and Plywood Sheathed, Nailed and Bolted has been superseded by ASTM-D7478/7478M - see below).

(d) Federal specification – None.

1. (PPP-E-540 Envelope, Water Resistant, For Packing List and Shipping Documents has been superseded by SAE- ARP1658 – see below PPP-B-601 Boxes, Wood, Cleated- Plywood, has been superseded by ASTM-D6251 – see below. PPP-P-40 Preservation and Packing of Hand Tools; Tools and Accessories for Power Driven, Metal and Woodworking Machines has been cancelled with no superseding document.)

(e) Other Publications

1. DA Pam 385-24, Army Radiation Safety Program

2. ASTM-D3951, Packaging, Commercial

3. ISO 1496-1 Series 1 freight containers – Specification and Testing – Part 1: General cargo containers for general purposes

4. ASTM-D6251/D6251M, Natural Wood-cleated Panelboard Shipping Boxes

5. ASTM-D7478/D7478M, Standard Specification for Wood Crates, Heavy Duty Sheathed.

6. SAE-ARP1658, Hose Assemblies, Installed, Guide for Visual Inspection

(2) IPDS Records and Reporting Requirements. All locations storing and maintaining IPDS assemblies shall maintain a log book to be stored with each major item or assembly where applicable. A central COSIS and maintenance file will be maintained by each site that will contain completed DA Form 2404 inspection form(s) from all inspections and actions taken during inspections and maintenance actions undertaken on each major item or assembly. The COSIS file will also contain a packing list, current and projected COSIS schedules, material and man hours required, and all other documentation that would provide an inspecting official with a clear understanding of the COSIS and maintenance history for each end item or assembly.

(3) Potable Water System (PWS). The packaging plan developed for this system provides preservation, packing, and marking requirements for the individual PWS equipment systems. The plan was developed to afford maximum protection and provides an efficient and economical method of achieving optimal life, utility, and performance of the PWS. The plan encompasses the protection of items from the point of receipt, to the point where the item is placed in use, to placing the item back in storage for future service. Contact TACOM Army Preposition Stock Team (APS) via NIPRNET, email: usarmy.detroit.tacom.mbx.g3-opertionscenter@army.mil, DSN 786-6692 / 586-282-6692.

(4) Fuel System Supply Point (FSSP). The Shipping and Storage Instructions (S&SI) describes the methods and procedures required for the shipment of the FSSP in standard ISO-1C containers and specialized Triple-Containers (TRICONS). It provides instructions with associated drawings and packing lists for each component. Procedures commonly used by the military for long-term storage have been incorporated. Contact TACOM Army Preposition Stock Team (APS) via NIPRNET email: usarmy.detroit.tacom.mbx.g3-operationscenter@army.mil, DSN 786-6692 / 586- 282-6692 or TACOM -Warren Packaging Team usarmy.detroit.tacom.mbx.ilsc-packaging@army.mil DSN 786-1860.

(5) Force Provider (FP). There are approved FP Packing, Packaging, Preservation, and Marking manuals (PPPM) and an approved FP COSIS manual. The COSIS manual includes individual container requirements tables and detailed instructions for performing the COSIS inspections, exercises and frequency that are prescribed in the Storage Serviceability Standards (SSS). The FP PPPM contains complete preservation, packaging, packing, and marking requirements focusing on equipment protection against physical deterioration or damage during shipments and long term storage. These plans were developed to afford maximum protection and provide an efficient and economical method of achieving optimal life, utility, and performance of Force Provider assets. In the event that a conflict exists between the PPPM or COSIS manual procedures and an approved commercial or approved technical manual for any of the individual components of FP assets; the Force Provider PPPM and or COSIS manual procedures shall take precedence.

(6) Force Provider equipment delivered to storage depots from reset or new production do not require the 10/20 receiving inspections described in TM 38-470, chapter 5, paragraph 2b. Verification of the contents and condition has already been documented. They will be brought to record in the condition code specified by the item manager. Exterior visual maintenance inspections are the only requirement upon receipt to ensure no damage occurred during shipment. Containers shall only be opened if external damage is extensive enough to require additional internal component inspection and after coordinating with the item manager.

(7) Force Provider has a biannual reporting requirement documenting planned, scheduled and completed COSIS inspections or exercises on major items or assemblies. Completed data shall also include equipment NSN or part number, module assigned to, total quantity, quantity with faults, list of faults found by serial number, faults repaired by depot or assistance requested, current condition code, date inspected.

(8) For assistance or report submission contact TACOM ILSC Force Provider Sustainment Team via NIPRNET email: usarmy.natick.tacom.mbx.ilsc-mission-support@army.mil DSN 256-4589 / 508-233-4589.

SECTION XIII. WATERCRAFT

NOTE

Detailed “Warm State” and “Long Term” preservation requirements applicable to all watercraft prepositioned at Yokohama North Dock (YND), Japan. Procedures applicable to specific craft are provided in the paragraphs below.

5.13 DETAILED WARM STATE PRESERVATION REQUIREMENTS

NOTE

Vessels use a modified storage configuration that keeps them in a more ready state for issue and use. ASC has instituted a reduced state of preservation in which the vessels are kept in a “warm state.” This is a condition between the “mothballed” preservation for long-term storage used in the past and the “hot state” of Active and Reserve vessels. In this lesser state of preservation, the vessels are still kept under dehumidification but they are not taped and sealed. Keeping the boats in this state allows maintenance teams to start and run equipment on a quarterly basis and conduct a minimum of a four hour sea trial on the vessels annually. Warm state vessels DH readings will monitored but will not meet the same requirement (40% +/- 10%) as other equipment under DH.

a. Underwater hull protection. Vessels forward stored at APS sites undergo bi-annual underwater hull cleaning and hull inspections. Hull cleaning before activation shall be considered on a case-by-case basis. At YND, diver services will be obtained to facilitate the wet stored vessels.

b. General Preservation Instructions:

(1) APS vessels will continue to be maintained under dehumidification specifications. Once the watercraft are preserved and subsequently stored either land cradled in dry storage or moored in wet storage, the interiors will remain in an unlighted condition to preclude or minimize common bacteria growth.

(2) Engines: Main propulsion, generator, fire pumps, and anchor winch.

(a) Lubrication systems: Vessels forward stored in the APS program are operated on a quarterly basis. Engines will be started, brought to normal operating temperatures, and secured. The engines are stored with OE-15/40 lubricating oil. Engines can be operated until the normal required oil change, or instructed by

AOAP. If oil is low, fill to operating level with OE-15/40 from the clean oil storage tank. All oil is tracked in the AOAP.

(b) Fuel systems: All fuel oil valves will be stored in the secured position. All strainers and filters will be primed and ready for full operation.

(c) Cooling systems: All engine fresh water cooling systems are inspected and tested on a quarterly basis. Systems are filled and maintained with a 50/50 solution of water and military antifreeze (A-A-52624). Coolant additives (DCA4) will be tested in all Cummins Diesel engines.

(3) Raw water systems: The engines of the dry stored vessels' raw water systems, including piping, coolers, and engine mounted pumps, will be drained and flushed with fresh clean water, and sea valves secured. Wet stored vessels sea chest valves are secured to prevent seawater entry. All systems will be fully connected, leaving the system intact and ready for service.

(4) Governors: Hydraulic type. Left in full operational status

(5) Reduction gears

(a) Hydraulic type. Add MIL- PRF-2104 combat tactical engine oil grade 30 to bring to operating level or, if contaminated, drained and flushed with operating fluid (OE/HDO-30). Cleaned systems will be filled to operating level with approved fluid (OE/HDO30) and operated during the maintenance cycle of the engines.

(b) Enclosed gears. Oil lubricated gear, will be inspected for lubricant level and for evidence of water or lubricant contamination. Add lubricant specified by the applicable lubrication order to its operating level or if contaminated, drain the lubricant and flush the gear housing. Fill the cleaned gear case to its operating level with approved lubricant and operated under no load to ensure coating of all interior surfaces and components.

(c) Exposed gears. Non-precision exposed gears subject to the weather will be coated with MIL-PRF16173, grade 1, preservative; all other exposed gears will be coated with MIL-PRF-16173, grade 2, preservative.

(d) Drive belts and pulleys. Leave fully tensioned and ready for service.

(e) Exposed drive chains. Coat with MIL-PRF-16173, Grade 2, preservative.

(6) Hydraulic systems. Brake, ramp, and steering systems will be filled to operating level with approved fluid required by the applicable lubrication order or the technical manual. Rams will be protected from weather by coating with light lithium grease. Do not apply a heavy coat of lithium grease as this will damage hydraulic seals.

(7) Brakes. The brake disc or drum facings will be coated with a thin film or rust inhibiting lacquer resisting synthetic primer.

(8) Air compressors. Systems are inspected and operated quarterly. Leave all air lines connected.

(9) Tanks

(a) Diesel oil day tanks. Diesel oil day tanks are maintained with fuel oil to facilitate the quarterly and annual tests and services conducted on vessels.

(b) Diesel oil storage tanks. Diesel fuel oil storage tanks will be cleaned and atomize sprayed with MIL-PRF-21260, grade PE-15-40, preservative. Excess preservative accumulating in the bottom of the tanks will be removed, and the tanks closed, ready to be filled with diesel fuel upon activation.

(c) Emergency generator tank (LCU). Emergency generator tank (LCU) will be filled to 80% capacity.

(d) Lubricating oil storage tanks. Oil storage tanks will be filled with oil specified in the applicable lubrication order or technical manual and placed in a ready-for-service condition.

(e) Dirty oil and sludge tanks. Dirty oil and sludge tanks will be drained, cleaned, closed up, and left in a ready condition.

(f) Raw water/ballast tanks. These tanks will be drained, fresh water rinsed and blown dry. In the case of large tanks, such as ballast tanks, they will be pumped, cleaned, and dried out. Reinstall access covers with new gaskets, and leave any installed vents open. Depending on the paint system condition, the raw water/ballast tanks may require the removal of corrosion and painting.

(g) Potable water tanks. Potable water tanks will be inspected. For severely deteriorated tanks (needing more than touch-up painting) sandblast the tanks and apply an epoxy coating per TB 43-0144. Potable water tank (pressure tanks, water heater/tanks, etc.) will be drained and blown dry with compressed air. Potable water storage tanks will be drained, pumped, dried, cleaned, and painted as required. Preservatives will not be applied or introduced into the potable water systems. Chlorine for sanitization water and tanks or watercraft will be removed from vessel, stored according to applicable HAZMAT regulations, and issued at activation.

1. Internal tanks vented inside a DH space: Reinstall access covers and leave installed tank vents open.

2. Internal tanks vented outside a DH space: Leave access covers open, and secure exterior ventilation with tape and glue. This is designed to keep the tanks under DH, while preventing untreated air from entering the DH space.

(h) Air tanks. Air tanks will be bled down. The valves for purging moisture from the tanks will be left open until activation. No other preservation is required.

(i) Fuel oil tanks. Clean and fog.

(10) Oil and fuel separator vessels. These will be drained. No other preservation required.

(11) Pumps (other than engine mounted).

(a) Raw water pumps. Raw water pumps will be drained and flushed with clean fresh water, and then blown dry with compressed air. Drain plugs on all pumps will be attached to the pump in a suitable storage receptacle.

(b) Fresh/portable water pumps. Fresh/portable water pumps will be drained and blown dry with compressed air. Drain plugs will be attached to the pump in a suitable storage receptacle. Do not drain or and blow dry the engine cooling water pumps since these systems have anti-freeze protection.

(c) Fuel and lubricating oil pumps. No preservation required. Leave primed and ready for service.

(d) Pump packaging. Pump shaft packing will be replaced when packing glands are taken up more than 50 percent capacity.

(12) Oil purifiers and filters. No preservation is required. Leave primed ready for service.

(13) Heat exchangers. The raw water sides of heat exchangers will be drained and blown dry with compressed air. Drain plugs will be reinstalled.

(14) Refrigeration units. Medium will be pumped down to the unit receiver. All receiver valves will be secured and tested for leaks. Cooling water will be removed from the unit. Belts and pulleys will be fully tensioned and ready for use.

(15) Electrical Equipment

(a) Rotating electrical equipment. Motors and generators can endure a lengthy period of exposure without deterioration. No preservation is required. Ensure that sealed motors exposed to the elements are properly sealed.

(b) Switch boards, panels, and controllers. No preservation is required. Secure doors on panels and controllers located within the dehumidified area in an open position. Remove disks from panels fitted with removable disks and ensure doors are closed. Sealed controllers on the exterior, exposed to the elements, are properly sealed and protected with protective covers.

(c) Receptacles. Exterior, non-watertight receptacles exposed to the elements will be sealed with glue and pressure sensitive tape.

(d) Horns, bells, buzzers and lights. All externally mounted horns, bells, buzzers and lights provided with waterproof protection will remain in place. Units not provided with waterproof protection will be removed, identified, and stowed in the dehumidified area.

(e) Gauges and instruments. No preservation required.

(f) Sound powered telephones. Sound powered telephones exposed to the elements are covered with protective covers.

(16) Sewage collecting, holding, and transfer (CHT) systems. CHT systems with raw or fresh water flush. Systems will be operated per posted instruction. The collecting tanks will be flushed with fresh water and pumped into the holding tank, and then the holding tank will be flushed and pumped into a shore sewage receptacle.

(17) Valves

(a) Weather exposed valves. Valves will be turned to a fully open position. The stems will be coated with MIL-PRF- 16173, grade 2, preservative, and then closed. Unpainted ferrous metal surfaces remaining exposed will be coated with MIL-PRF-16173, grade 1 preservative.

(b) Sea valves and overboard discharge valves will be secured in a closed position. Sea strainers baskets will be cleaned and left in place with covers installed and secured, ready for service.

(c) Other valves within compartments. Valves will be left in an open position unless preservation procedure or configuration dictates otherwise, in which case the valve/valves would be closed.

(18) Piping Systems

(a) Raw water piping systems. Dry stored vessels raw water systems (bilge and ballast, firefighting, sanitary, and engine cooling) will be drained and flushed with clean fresh water. Wet Stored vessels piping systems will remain serviceable to facilitate quarterly and annual services.

(b) Fresh water piping systems. All fresh water systems including potable, heating, and hot water will be drained. Lines and fittings removed to effect drainage will be reinstalled leaving the system ready for service. This will be accomplished in conjunction with potable water pumps, as described in this paragraph.

(19) Capstans, winches, and windlasses. Gear boxes (enclosed gears) and brake drums will also be preserved per this paragraph. All exposed ferrous metal surfaces of shafts, linkages, and threaded adjustments will be coated with MIL-PRF-16173, grade 1 preservative. Approved protective covers will be installed for protection from the elements.

(20) Davits. Davits are inspected and tested per applicable TM. All certifications are kept current.

(21) Deck fitting. Flush deck fittings will have the threads coated with MIL-PRF-16173, grade 2, preservative and reinstalled.

(22) Anchors. Any bare ferrous metal surfaces and unpainted fittings anchors rigged or stowed on deck will be coated with MIL-PRF-16173, grade 1, preservative.

(23) Rigging, fitting and wire rope.

(a) Rigging and related fittings. Rigging, standing rigging, and related fittings will remain in place and will be cleaned and coated with rust resistant lubricant (MIL-PRF-18458). Threaded fittings such as turnbuckles, shackles, and ramp load binders will be turned sufficiently to ensure a coating of preservative on the mating surfaces.

(b) Wire rope. Wire rope on all of the craft will remain reeved and rigged. Wire rope on drums such as winches and similar gear will be inspected and coated with rust resistant lubricant (MIL-PRF-18458). The exposed surfaces of the drums will be cleaned and coated. Precautions will be taken to ensure wire ropes on the landing craft that are stowed within the voids or ramps are not overlooked. Ensure tension is maintained, with proper lay, as the wire rope is rewound onto the drums.

(24) Sheaves. All sheaves will be lubricated per the design watercraft's applicable lubrication order.

(25) Steering systems. Unpainted surfaces of quadrants and linkages, exposed to the weather and elements will be coated with MIL-PRF-16173, grade 1 preservative. Exposed surfaces of hydraulic rams will be coated with a thin coat of lithium grease.

(26) Galley equipment. A light coat of MIL-C-10382, vegetable oil, will be applied to those surfaces of galley equipment vulnerable to corrosion, such as grill tops, and so forth. Oven doors will be open. Doors on refrigerators will be blocked open for ventilation.

(27) Sanitary drains. All drain traps will be drained. Plugs will be removed to drain the systems and stored in a suitable receptacle adjacent to the fitted position.

(28) Fixed firefighting systems. Systems will be ready for service. Systems will be tested annually per CFR and certification stored in the appropriate vessel’s files. Some batteries may have solar charges installed. When new solar charges are installed, safety and ventilations must be considered. All CFR and IEEE regulations must be followed.

(29) Batteries. Are tested and maintained per the applicable TM and remain on board to facilitate quarterly and annual services.

5.14 DETAILED LONG TERM PRESERVATION REQUIREMENTS

NOTE

These instructions contain general preservation procedures, applicable to all watercraft prepositioned at Yokohama North Dock (YND), Japan. Procedures applicable to specific craft are provided in paragraphs below.

a. Underwater hull protection. Prior to accomplishing the general preservation instructions contained in the following paragraphs, the underwater hulls will be cleaned and preserved. Accordingly, all watercraft will undergo dry-docking for required underwater hull repairs, overhaul of the sea valves and strainers, cleaning and painting, and renewal of the cathodic protection system (sea chest and hull zincs), shaft alignments, cutlass bearing renewal, etc. Dry-dock specifications include the following:

(1) Indefinite items for underwater weld repair, hull plug welds and plate renewal, all of which will be determined after dry-docking.

(2) Routine overhaul of sea valves and strainers.

(3) Items for cleaning and painting per TB 43-0144, painting of watercraft.

(4) The cathode protection system (zinc configuration) shall be type ZHC or ZSS (bolt-on) zincs and installed per TB 43-0144.

b. General preservation instructions.

(1) Equipment, systems, and machinery of each watercraft will be processed per the following general instruction. Once the watercraft are preserved and subsequently stored either land cradled in dry storage or moored in wet storage, the interiors will remain in an unlighted condition to preclude or minimize common bacteria growth.

(2) Cooling systems. All engine fresh water cooling systems will be drained and refilled at the beginning of each preservation cycle with a 50/50 solution of water and military antifreeze (A-A-52624), ensuring the engines are in a ready- to-run status.

(3) Raw water systems. The engine's raw water systems, including piping, coolers, and engine mounted pumps, will be drained and flushed with fresh clean water. This will be accomplished by removing installed drain plugs, and/or breaking lines at convenient/ accessible low points for the fresh water flush and blowing it dry with compressed air. At the beginning of this evolution, the system sea valves will be secured (wire closed) and not reopened until activation. After all systems, lines and pumps are drained, flushed, and blown dry, plugs will be reinstalled and broken lines will be reconnected, leaving the system intact and ready for service.

(4) Governors: Hydraulic type. Fill to operating level with MIL-PRF-21260, grade PE 15/40, preservative oil.

(5) Reduction gears

(a) Hydraulic type. Prior to engine preservation, the hydraulic reduction gears will be inspected for proper fluid level and contamination. Add MIL-PRF-2104 combat tactical engine oil grade 30 to bring to operating level or, if contaminated, drain and flush with operating fluid (OE/HDO-30). Cleaned systems will be filled to operating level with approved fluid (OE/HDO30) and operated during the preservation cycle of the engines. Coat any exposed ferrous surfaces, control rods and linkages with MIL-PRF-21260, grade PE-15-40, preservative oil.

(b) Enclosed gears. Oil lubricated gears, not otherwise provided for, will be inspected for lubricant level and for evidence of water or lubricant contamination. Add lubricant specified by the applicable lubrication order to its operating level or if contaminated, drain the lubricant and flush the gear housing. Fill the cleaned gear case to its operating level with approved lubricant and operated under no load to ensure coating of all interior surfaces and components.

(c) Exposed gears. Non-precision exposed gears subject to the weather will be coated with MIL-PRF16173, grade 1, preservative; all other exposed gears will be coated with MIL-PRF-16173, grade 2, preservative.

(d) Drive belts and pulleys. Drive belts will be left fully tensioned and ready for service. Pulley grooves will be coated with a thin film of rust inhibiting lacquer resisting synthetic primer.

(e) Exposed drive chains. Exposed drive chains will be coated with MIL-PRF-16173, Grade 2, preservative.

(6) Hydraulic systems. Brake, ramp, or steering systems will be filled to operating level with approved fluid required by the applicable lubrication order or the technical manual.

(7) Brakes. The brake disc or drum facings will be coated with a thin film or rust inhibiting lacquer resisting synthetic primer.

(8) Air compressors. The operating lubricant will be drained and the compressor crankcase refilled to operating level with MIL-PRF-21260, preservative lubricating oil, grade PE-15/40. The air line will be disconnected from the compressor. The air cleaner will be removed, and while the compressor is operating, spray 4 or 5 ounces of MIL-PRF-21260, grade PE-15/40, into the air intake. The compressor will be operated long enough to ensure coverage of all internal surfaces. The air cleaner and line will be reinstalled, leaving the compressor ready for service.

(9) Tanks

(a) Diesel oil day tanks. Upon completion of cleaning, each tank will be atomizing sprayed with MIL-PRF-21260, grade PE-15/40, preservative. Excess preservative accumulating in the bottom of the tanks will be removed, and the tanks closed, ready to be filled with diesel fuel upon activation.

(b) Diesel oil day tanks. Upon completion of cleaning, each tank will be atomizing sprayed with MIL-PRF-21260, grade PE-15/40, preservative. Excess preservative accumulating in the bottom of the tanks will be removed, and the tanks closed, ready to be filled with diesel fuel upon activation.

(c) Emergency generator tank (LCU) will be filled to 80% capacity.

(d) Lubricating oil storage tanks. Oil storage tanks will be filled with oil specified in the applicable lubrication order or technical manual and placed in a ready-for-service condition.

(e) Dirty oil and sludge tanks. Dirty oil and sludge tanks will be drained, cleaned, closed up, and left in a ready-for- service condition.

(f) Raw water/ballast tanks. These tanks will be drained and blown dry. In the case of large tanks, such as ballast tanks, they will be pumped, cleaned, and dried out. Reinstall access covers with new gaskets and leave any installed vents open. Depending on the paint system condition, the raw water/ballast tanks may require the removal of corrosion and painting.

(g) Potable water tanks. Portable water tanks will be inspected. For severely deteriorated tanks (needing more than touch-up painting) sandblast the tanks and apply an epoxy coating per TB 43-0144. Potable water tanks (pressure tanks, water heater/tanks, etc.), will be drained and blown dry with compressed air. Potable water storage tanks will be drained, pumped, dried, cleaned, and painted as required. Preservatives will not be applied or introduced into the portable water systems. Chlorine for sanitization water and tanks or watercraft will be placed aboard the respective craft in a cool dry place.

1. Internal tanks vented inside a DH space. Reinstall access covers and leave installed tank vents open.

2. Internal tanks vented outside a DH space Leave access covers open, and secure exterior ventilation with tape and glue. This is designed to keep the tanks under DH, while preventing untreated air from entering the DH space.

(h) Air tanks. Air tanks will be bled down. The valves for purging moisture from the tanks will be left open until activation. No other preservation is required.

(10) Oil and fuel separator vessels. These will be drained. No other preservation required.

(11) Pumps (Other than engine mounted).

(a) Raw water pumps. Raw water pumps will be drained and flushed with clean fresh water, and then blown dry with compressed air. Drain plugs on all pumps will be attached to the pump in a suitable storage receptacle. LCU 2000 electric fire pumps are operated quarterly and its flexible connections shall be left in place.

(b) Fresh/portable water pumps. Fresh/portable water pumps will be drained and blown dry with compressed air. Drain plugs will be attached to the pump in a suitable storage receptacle. Do not drain or blow dry the engine cooling water pumps since these systems have anti-freeze protection.

(c) Fuel and lubricating oil pumps. No preservation required. Leave primed and ready for service.

(d) Pump packaging. Pump shaft packing will be replaced when packing glands are taken up more than 50 percent capacity.

(12) Oil purifiers and filters. No preservation is required. Leave primed ready for service.

(13) Heat exchangers. The raw water sides of heat exchangers will be drained and blown dry with compressed air. Drain plugs will be reinstalled.

(14) Refrigeration units. Medium will be pumped down to the unit receiver. All receiver valves will be secured and tested for leaks. Cooling water will be removed from the unit.

(15) Electrical Equipment

(a) Rotating electrical equipment. Motors and generators can endure a lengthy period of exposure without deterioration. No preservation is required.

(b) Switch boards, panels, and controllers. No preservation is required. Secure doors on panels and controllers located within the dehumidified area in an open position. Remove disks from panels fitted with removable disks and close doors. Ensure that sealed controllers on the exterior, exposed to the elements, are properly sealed and protected with protective covers.

(c) Receptacles. Non-watertight receptacles exposed to the elements will be sealed with glue and pressure sensitive tape.

(d) Horns, bells, buzzers and lights. All externally mounted horns, bells, buzzers and lights provided with waterproof protection will remain in place. Units not provided with waterproof protection will be removed, identified, and stowed in the dehumidified area.

(e) Gauges and instruments. No preservation required.

(f) Sound powered telephones will have the internal components removed, labeled, and stored in a receptacle within the wheelhouse.

(16) Sewage collecting, holding, and transfer (CHT) systems. CHT systems with raw or fresh water flush: Applicable to the Design 3006 Tugs, Flight III. The collecting tanks will be flushed with fresh water and pumped into the holding tank. Flush the holding tank into a shore sewage receptacle, leaving both the collecting and holding tanks empty and ready for service. The grinder pumps will be drained and filled with MIL-PRF-21260, PE-15/40, preservative oil.

(17) Valves

(a) Weather exposed valves. Valves will be turned to a fully open position. The stems will be coated with MIL-PRF- 16173, grade 2, preservative, and then closed. Unpainted ferrous metal surfaces remaining exposed will be coated with MIL-PRF-16173, grade 1 preservative.

(b) Sea valves and overboard discharge valves will be secured in a closed position with wire to prevent accidental opening. Sea strainer baskets will be cleaned and left in place with covers installed and secured, ready for service.

(c) Other valves within compartments. Valves will be left in an open position unless preservation procedure or configuration dictates otherwise in which case the valve/valves would be closed. For example, the fuel oil day tank's supply valves will remain closed until such time as the craft is activated.

(18) Capstans, winches, and windlasses. Gear boxes (enclosed gears) and brake drums will also be preserved per this paragraph. All exposed ferrous metal surfaces of shafts, linkages, and threaded adjustments will be coated with MIL- PRF-16173, grade 1 preservative. Protective covers will be installed for protection from the elements.

(19) Piping Systems

(a) Raw water piping systems. All raw water systems (bilge and ballast, firefighting, sanitary, and engine cooling) will be drained, flushed with clean fresh water, and blown dry. Lines or fittings broken or removed to effect draining or flushing will be reinstalled leaving the system ready for service.

(b) Fresh water piping systems. All fresh water systems including potable, heating, and hot water will be drained, and blown dry with dry compressed air. Lines and fittings removed to effect drainage will be reinstalled leaving the system ready for service. This will be accomplished in conjunction with potable water pumps, as described in paragraph 5.b.(12)(b).

(20) Davits. Davits rigged or unrigged, and stowed on deck, will have the bearing surfaces and matching davit socket bearing surfaces coated with MIL-PRF-16173, grade 2 preservative.

(21) Deck fitting. Flush deck fittings will have the threads coated with MIL-PRF-16173, grade 2, preservative and reinstalled.

(22) Anchors. Any bare ferrous metal surfaces and unpainted fittings anchors rigged or stowed on deck will be coated with MIL-PRF-16173, grade 1, preservative.

(23) Rigging, fittings and wire rope.

(a) Rigging, standing rigging, and related fittings will remain in place and will be cleaned and coated with rust resistant lubricant (MIL-PRF-18458). Threaded fittings such as turnbuckles, shackles, and ramp load binders will be turned sufficiently to ensure a coating of preservative on the mating surfaces.

(b) Wire rope. Wire rope on all of the craft will remain reeved and rigged. Wire rope on drums such as winches and similar gear will be inspected and coated with rust resistant lubricant (MIL-PRF-18458). The exposed surfaces of the drums will be cleaned and coated. Ensure wire ropes on the landing craft that are stowed through the voids or ramps are not overlooked. Ensure tension is maintained, with proper lay, as the wire rope is rewound onto the drums.

(24) Sheaves. All sheaves will be lubricated per the watercraft's applicable lubrication order.

(25) Steering systems. Unpainted surfaces of quadrants and linkages, exposed to the weather and elements will be coated with MIL-PRF-16173, grade 1 preservative. Exposed surfaces of hydraulic rams will be coated with a thin coat of lithium grease.

(26) Galley equipment. A light coat of MIL-C-10382, vegetable oil, will be applied to those surfaces of galley equipment vulnerable to corrosion, such as grill tops. Oven doors will be locked and wired open. Doors on refrigerators will be blocked and wired open for ventilation.

(27) The wire rope exposed to the elements including the unpainted surfaces of the sheaves, will be thoroughly cleaned and coated with rust resistant lubricant (MIL-PRF-18458). The wire rope within the rotate machinery house, from the house penetrations to the top layer on the drums will also be coated.

(28) Sanitary drains. All drain traps will be drained. Plugs will be removed to drain the systems and stored in a suitable receptacle adjacent to the fitted position.

(29) Fixed firefighting systems. Systems will be ready for service. Systems will be tested and certification stored in the appropriate vessel's files.

(30) Equipment removal. LCM, radio mounts, horns, life ring mounts, light masts, screen wipers, and well deck stanchions will be removed and stored within the appropriate vessel within the dehumidification boundaries.

c. Special Preservation Instructions

(1) Dehumidification. Critical areas of each craft will be placed under dehumidification per specific design craft. Sealing of the watercraft will be accomplished utilizing, as much as possible, installed doors, scuttles, covers, port lights, etc.

(2) Lubrication. Each craft will be lubricated per the applicable lubrication order, except in those areas requiring the application of contact preservatives.

(3) Hazardous materials. Materials considered hazardous, will not be stored aboard preserved watercraft.

(a) Paint, thinners, solvents, etc. Open or partially used containers of flammable materials will be removed from the craft by the preserving activity. Disposal will be by approved methods.

(b) Pyrotechnics. Pyrotechnics will be inventoried, packaged using an approved method (identified as belonging to craft), removed from the craft, and stored at the appropriate armory or ASP.

(c) The oxygen and acetylene cylinders will be removed and stored in an authorized storage configuration.

(4) Batteries. After all other preservation has been accomplished and the need for the installed batteries no longer exists, the battery cables shall be disconnected. The old batteries shall be removed and turned into the preservation facility supply section for disposition. New starting batteries (dry charged) shall be installed and secured in the battery storage trays. All interconnecting cables will be connected and coated with grease to prevent corrosion. The positive and negative terminals will be sealed in plastic. Electrolyte for the batteries to be used when the craft are activated shall be placed and secured in close proximity of the batteries.

(5) Machinery and miscellaneous equipment covers. Machinery and miscellaneous equipment will be protected from the elements with protective covers.

(6) Plywood blanks. Blanks are normally used in preservation procedures to introduce dehumidification to a vessel. They are normally sealed with pressure sensitive tape, glue, and strippable and bituminous coatings over large openings penetrating the dehumidified area which are not air tight. It is the responsibility of the storage activity/organization to lift the actual dimensions from the watercraft for each blank to be fabricated and to design, procure and install the simple quick-acting dogging devices or strong back securing devices.

(7) BII. BII boat sets are provided for each watercraft as a minimum authorized requirement for the operation, maintenance, health, safety, and welfare of the crew. All vessel operating equipment, supplies, repair parts, and accessory items will have been previously inventoried, replenished, re-preserved, and repackaged by the storage activity/organization. The storage activity/organization will also have had previously re-stowed on each vessel all items in their appropriate stowage brackets, bins, lockers, and storerooms, except accessory items normally stored on the exterior (fire hoses, nozzles, fire axes, spanner and dog wrenches), which shall be tagged with identification/location and stored inside the dehumidification zone. Items that are susceptible to dry rot or that can be adversely affected by the temperatures aboard the vessels will be removed and stored in a temperature controlled area. Refer to the appropriate Common Table of Allowances (CTA) for Army vessels, Table of Distribution and Allowances (TDA), vessel technical manuals (TMs), and BII boat set listings for the authorized items and quantities. All vessel technical manuals, lubrication orders, drawings, support publications, and operating logs and records will be inventoried, replenished, and stowed in lockers aboard the watercraft.

(8) Gaskets, packing, and fasteners. New gaskets, packing, seals, and fasteners in good condition will be used during reassembly of equipment upon completion of preservation. This procedure does not provide for openings in fuel, raw water, or fresh water systems to DH areas.

(9) Fresh water chlorination.: Chlorometric test kits, calcium hypochlorite technical (HTH) face shields, and rubber gloves will be stored on board the watercraft. The calcium hypochlorite technical (HTH) will be stowed in a cool dry place inside the watercraft.

(10) On dry stored watercraft, the packing will be removed from the stern glands and stowed in a convenient position alongside in the engine room ready for installation at activation.

d. COSIS Re-preservation

(1) When watercrafts are activated for routine cyclic inspection and maintenance, re-preservation is required. Re-preservation requires limited operations of machinery and must be accomplished before the watercrafts are returned to storage. The amount of re-preservation required, depends entirely upon the extent of de-preservation or activation.

(2) The man-hour requirements for re-preservation will not be appreciably different from initial preservation; however, the material requirements will be considerably less.

(a) Cost savings can be realized by reusing PVC piping, flex hoses, sensing elements, humidistat, plywood blanks, and protective covers.

(b) Preservation oil in the engine lubricating systems and antifreeze in the fresh water cooling systems will require replenishment only.

(c) Engine fuel systems will require preservation.

(d) Essentially, the re-preservation will follow the pertinent instructions set forth previously, in the initial preservation routine.

(e) Dry-docking for underwater hull cleaning and painting shall not be required if all underwater surfaces are washed down with fresh water to remove accumulated marine growth and slime. This can be accomplished with the fire hose; however, care shall be taken to ensure that the paint system is not damaged during wash down.

(f) Since the tray loaded starting batteries were not used, replacement will not be necessary. The interim 12 VDC batteries will be used for re-preservation, after which they will be removed from the watercraft and turned in for disposal. The next activation contact team will replace batteries that are disposed of.

(g) Specialized equipment will not require replacement.

(h) The lubricating oil storage tanks shall not need replenishing.

(i) On completion of re-preservation requirements, prepare DA Form 3256 (Preservation and De-preservation Guide for Marine Equipment).

(3) Detailed preservation instructions concerned with each particular design of watercraft are identified in the TACOM publication "Preservation Procedures for New Watercraft Assigned to the Army Strategic Mobility Prepositioned Fleet."

(4) Exposed, machined surfaces of propeller shafts, including splices, slip joints, constant velocity joints, and universal joints will be coated with type MIL-PRF-16173, grade 4, preservative.

e. Underwater hull protection. Prior to accomplishing the general preservation instructions contained in the following paragraphs, the underwater hulls will be cleaned and preserved. Accordingly, all watercraft will undergo dry-docking for required underwater hull repairs, overhaul of the sea valves and strainers, cleaning and painting, and renewal of the cathodic protection system (sea chest and hull zincs), shaft alignments, cutlass bearing renewal, etc. Dry-dock specification shall include:

(1) Indefinite items for underwater weld repair, hull plug welds and plate renewal, all of which will be determined after dry-docking.

(2) Routine overhaul of sea valves and strainers.

(3) Items for cleaning and painting per TB 43-0144, Painting of Watercraft.

(4) The cathodic protection system (zinc configuration) shall be type ZHC or ZSS (bolt-on) zincs and shall be installed per TB 43-0144.

NOTE

To alleviate a potential deterioration problem with the underwater paint system, all underwater surfaces must be washed down with fresh clean water immediately after each craft is removed from the water for dry storage or maintenance. It is important that all marine growth and slime be removed. Extreme care shall be exercised to prevent damage to the underwater paint systems during wash down.

f. General preservation instructions.

(1) Equipment, systems, and machinery of each watercraft will be processed per the following general instruction. Dehumidification will be processed per paragraphs (6) through (9) below. Once the watercraft are preserved

and subsequently stored either land cradled in dry storage or moored in wet storage, the interiors will remain in an unlighted condition to preclude or minimize common bacteria growth.

(2) Cooling systems. All engine fresh water cooling systems will be drained and refilled at the beginning of each preservation cycle with a 50/50 solution of water and military antifreeze (A-A-52624), ensuring the engines are in a ready- to-run status.

(3) Raw water systems. Engines' raw water systems, including piping, coolers, and engine mounted pumps, shall be drained and flushed with fresh clean water. This shall be accomplished by removing installed drain plugs, and/or breaking lines at convenient/accessible low points for the fresh water flush and blowing dry with compressed air. At the start of this evolution, the system sea valves shall be secured (wire closed) and not reopened until activation. After all systems/lines/pumps are drained, flushed, and blown dry, plugs shall be reinstalled and broken lines shall be reconnected, leaving the system intact and ready for service.

(4) Governors. Hydraulic type. Fill to operating level with MIL-PRF-21260, grade PE 15/40, preservative oil.

(5) Reduction gears.

(a) Hydraulic type. Prior to engine preservation, the hydraulic reduction gear systems will be inspected for fluid level and contamination. Add MIL-PRF-2104 combat tactical engine oil grade 30 to bring to operating level or, if contaminated, drain and flush with operating fluid (OE/HDO-30). Cleaned systems will be filled to operating level with approved fluid (OE/HDO30) and operated during the preservation cycle of the engines. Any exposed ferrous surfaces, control rods/linkages, and so forth, will be coated with MIL-PRF-21260, grade PE-15-40, preservative oil.

(b) Enclosed gears. Oil lubricated gears not otherwise provided for will be inspected for level of lubricant and for evidence of water and contamination of lubricant. Add lubricant specified by the applicable lubrication order to raise to operating level or if contaminated, drain the lubricant and flush the gear housing. The cleaned gear case will be filled to operating level with approved lubricant and operated under no load to ensure coating of all interior surfaces and components.

(c) Exposed gears. Non-precision exposed gears subject to the weather will be coated with MIL-PRF-16173, grade 1, preservative; all other exposed gears will be coated with MIL-PRF-16173, grade 2, preservative.

(d) Drive belts and pulleys. Drive belts will be left fully tensioned and ready for service. Pulley grooves shall be coated with a thin film of rust inhibiting lacquer resisting synthetic primer.

(e) Exposed drive chains. Exposed drive chains will be coated with MIL-PRF-16173, Grade 2, preservative.

(6) Hydraulic systems. Brake, ramp, or steering systems shall be filled to operating level with approved fluid required by the applicable lubrication order or the technical manual.

(7) Brakes. The brake disc and/or drum facings shall be coated with a thin film or rust inhibiting lacquer resisting synthetic primer.

(8) Air compressors. The operating lubricant will be drained and the compressor crankcase refilled to operating level with MIL-PRF-21260, preservative lubricating oil, grade PE-15/40. The air line will be disconnected from the compressor. The air cleaner will be removed, and while the compressor is operating, spray 4 or 5 ounces of MIL-PRF- 21260, grade PE-15/40, into the air intake. The compressor will be operated long enough to ensure coverage of all internal surfaces. The air cleaner and line will be reinstalled, leaving the compressor ready for service.

(9) Tanks

(a) Diesel oil day tanks. Upon completion of cleaning, each tank will be atomize sprayed with MIL-PRF-21260, grade PE-15/40, preservative. Excess preservative accumulating in the bottom of the tanks shall be removed, and the tanks closed, ready to be filled with diesel fuel upon activation.

(b) Diesel oil storage tanks. Diesel fuel oil storage tanks will be cleaned and atomize sprayed with MIL-PRF-21260, grade PE-15-40, preservative. Excess preservative accumulating in the bottom of the tanks shall be removed, and the tanks closed, ready to be filled with diesel fuel upon activation.

(c) Lubricating oil storage tanks. Lubrication oil storage tanks shall be filled with oil as specified in the applicable lubrication order or technical manual to place watercraft in a ready-for-service condition.

(d) Dirty oil and sludge tanks. Dirty oil and sludge tanks shall be drained, cleaned, closed up, and left in a ready-for- service condition.

(e) Raw water/ballast tanks. These tanks shall be drained and blown dry. In the case of large tanks, such as ballast tanks, they will be pumped, cleaned, and dried out. Reinstall access covers with new gaskets and leave any installed vents open. Depending on paint system condition, the raw water/ballast tanks may require the removal of corrosion and painting.

(f) Potable water tanks. Portable water tanks shall be inspected prior to preparation of Specifications for Underwater Hull Protection work specified in paragraph a above. For severely deteriorated tanks (needing more than touch-up painting), an item shall be included in the Underwater Hull Protection Specifications to sandblast the tanks and apply an epoxy coating per TB 43-0144. Potable water tanks (pressure tanks, hot water heater/tanks, and so forth), will be drained and blown dry with compressed air. Potable water storage tanks will be drained/pumped, dried, cleaned, and painted as required. Reinstall access covers (access covers on LCU 2000 class vessels are normally left open) and leave installed tank vents open. Preservatives will not be applied or introduced into the portable water systems. Chlorine for sanitization water and tanks or watercraft shall be placed aboard the respective craft in a cool dry place.

(g) Air tanks. Air tanks will be bled down. The valves for purging moisture from the tanks will be left open until activation. No other preservation is required.

(h) Fuel oil tanks clean and fog.

(i) Emergency generator tank (LCU, LT) will be filled to 80% capacity.

(10) Oil and separator vessels. These shall be drained. No other preservation required.

(11) Pumps (Other than engine mounted).

(a) Raw water pumps. Raw water pumps shall be drained and flushed with clean fresh water and then blown dry with compressed air. Drain plugs on all pumps shall be attached to the pump in a suitable storage receptacle. LCU 2000 electric fire pump will have flexible connection removed and stored adjacent to the pump with the fastening contained in a suitable storage receptacle.

(b) Fresh/potable water pumps. Fresh/potable water pumps shall be drained and blown dry with compressed air. Drain plugs shall be attached to the pump in a suitable storage receptacle. Do not drain and blow dry the engine cooling water pumps, these systems have anti-freeze protection.

(c) Fuel and lubricating oil pumps. No preservation required. Leave primed and ready for service.

(d) Pump packaging. Pump shaft packing shall be replaced when packing glands are taken up more than 50 percent.

(12) Oil purifiers and filters. No preservation is required. Leave primed ready for service.

(13) Heat exchangers. The raw water sides of heat exchangers shall be drained and blown dry with compressed air. Drain plugs shall be reinstalled.

(14) Refrigeration units. The refrigerant will be pumped down to the unit receiver. All receiver valves will be secured and tested for leaks. Cooling water will be removed from the unit as per this paragraph. Belts and pulleys shall be preserved per this paragraph.

(15) Electrical Equipment

(a) Rotating electrical equipment. Motors and generators can endure a lengthy period of exposure without deterioration. No preservation is required. Ensure that sealed motors exposed to the elements are properly sealed.

(b) Switch boards, panels, and controllers. No preservation is required. Tie doors on panels and controllers located within the dehumidified area in an open position. Panels fitted with removable disks will have the disks removed and enclosure doors closed. Ensure that sealed controllers on the exterior, exposed to the elements, are properly sealed and protected with Herculite covers.

(c) Receptacles. Non-watertight receptacles exposed to the elements will be sealed with glue and pressure sensitive tape.

(d) Horns, bells, buzzers and lights. All externally mounted horns, bells, buzzers and lights provided with waterproof protection will remain in place. Units not provided with waterproof protection will be removed, identified, and stowed in the dehumidified area.

(e) Gauges and instruments. No preservation required.

(f) Sound powered telephones will have the internals removed, labeled, and stored in a receptacle within the wheelhouse of the appropriate vessel.

(16) Sewage collecting, holding, and transfer (CHT) systems.

(a) CHT systems with raw or fresh water flush. While the vessel's power systems are still operational (early on in the preservation evolution), the system shall be operated per posted instruction: that is, flushing and pumping the collecting tank into the holding tank, then flushing the holding tank into a shore sewage receptacle, leaving both the collecting and holding tanks empty and ready for service. The grinder pumps shall be drained and filled with MIL-PRF-21260, PE-15/40, preservative oil.

(17) Valves

(a) Weather exposed valves. Valves will be turned to a fully open position. The stems will be coated with MIL-PRF- 16173, grade 2, preservative, and then closed. Unpainted ferrous metal surfaces remaining exposed will be coated with MIL-PRF-16173, grade 1 preservative.

(b) Sea valves and overboard discharge valves will be secured in a closed position with wire to prevent accidental opening. Sea strainers baskets will be cleaned and left in place with covers installed and secured, ready for service.

(c) Other valves within compartments, valves will be left in an open position unless preservation procedure/configuration dictates otherwise in which case the valve/valves would be closed. For example, the fuel oil day tanks supply valves shall remain closed until such time as the craft is activated.

(18) Capstans, winches and windlasses. The above deck portions of capstans, winches, and windlasses such as exposed gears and pinions will be preserved per this paragraph. Gear boxes (enclosed gears) and brake drums will be preserved per this paragraph. All exposed ferrous metal surfaces of shafts, linkages, and threaded adjustments shall be coated with MIL-PRF-16173, grade 1 preservative. Herculite covers shall be installed for protection from the elements.

(19) Piping Systems

(a) Raw water piping systems. All raw water systems (bilge and ballast, firefighting, sanitary, and engine cooling) shall be drained, flushed with clean fresh water, and blown dry. Lines or fittings broken or removed to effect draining and/or flushing shall be reinstalled leaving the system ready for service. This shall be accomplished in conjunction with the preservation of raw water pumps as described in this paragraph.

(b) Fresh water piping systems. All fresh water systems including potable, heating, and hot water shall be drained, and blown dry with dry compressed air. Lines and/or fittings removed to effect drainage shall be reinstalled leaving the system ready for service. This shall be accomplished in conjunction with potable water pumps, as described in this paragraph.

(20) Davits. Davits rigged or unrigged, and stowed on deck, shall have the bearing surfaces and matching davit socket bearing surfaces coated with MIL-PRF-16173, grade 2 preservative.

(21) Deck fitting. Flush deck fittings shall have the threads coated with MIL-PRF-16173, grade 2, preservative and reinstalled.

(22) Anchors. Any bare ferrous metal surfaces and unpainted fittings anchors rigged or stowed on deck shall be coated with MIL-PRF-16173, grade 1, preservative.

(23) Wire, rope, rigging and fittings.

(a) Rigging, standing rigging, and related fittings will remain in place and will be cleaned and coated with rust resistant lubricant (MIL-PRF-18458). Threaded fittings such as turnbuckles, shackles, and ramp load binders shall be turned sufficiently to ensure a coating of preservative on the mating surfaces.

(b) Wire rope. Wire rope on all of the craft will remain reeved and/or rigged. Wire rope on drums such as winches and similar gear will be inspected and coated with rust resistant lubricant (MIL-PRF-18458). The exposed surfaces of the drums will also be cleaned and coated. Precautions shall be taken to ensure wire ropes on the landing craft that are stowed through the voids and/or ramps are not overlooked. Ensure that tension is maintained, with proper lay, as the wire rope is rewound onto the drums.

(24) Sheaves. All sheaves shall be lubricated per the design watercraft's applicable lubrication order.

(25) Steering systems. Unpainted surfaces of quadrants, rods, and linkages, exposed to the weather/elements shall be coated with MIL-PRF-16173, grade 1 preservative. Exposed surfaces of hydraulic rams shall be coated with MIL-PRF- 21260, grade PE-15-40.

(26) Galley equipment. A light coat of MIL-C-10382, vegetable oil, will be applied to those surfaces of galley equipment vulnerable to corrosion, such as grill tops, and so forth. Oven doors will be locked and wired open. Oil burners of galley ranges will be drained. Doors on refrigerators will be blocked and wired open for ventilation.

(27) Sanitary drains. All drain traps shall be drained. Plugs will be removed to drain the systems and stored in a suitable receptacle adjacent to the fitted position.

(28) Fixed firefighting systems. Systems shall be ready for service. Systems will be tested and certification stored in the appropriate vessel’s files.

(29) Equipment removal. LCM, radio mounts, horns, life ring mounts, light masts, screen wipers, and well deck stanchions will be removed and stored within the appropriate vessel with the dehumidification boundaries.

g. Special preservation instructions.

(1) Batteries. After all other preservation has been accomplished and the need for the installed batteries no longer exists, the battery cables shall be disconnected. The cable lugs shall be cleaned and coated with a light coat of oil or grease. The old batteries shall be removed and turned into the preservation facility supply section for disposition. New starting batteries (dry charged) shall be installed and secured in the battery storage trays. The cables will not be connected. Electrolyte for the batteries to be used when the craft is activated in a hostile environment shall be placed and secured in close proximity of the batteries. Two each 12V dry charged batteries for use during biennial activation and test will be stored on each preserved watercraft. Electrolyte in sufficient quantity will be stored near each battery. Electrolyte must have at least 2 years of SL remaining.

(2) Dehumidification. Critical areas of each craft shall be placed under dehumidification per paragraphs (6) through (9) below, each of which pertains to a specific design craft Sealing of the watercraft shall be accomplished utilizing, as much as possible, installed doors, scuttles, covers, port lights, etc., augmented with tape, glue and strip coat, plywood, and duct seal.

(3) Lubrication. Each craft will be lubricated per the applicable lubrication order, except in those areas requiring the application of contact preservatives.

(4) Hazardous materials. Materials considered hazardous including, but not limited to, open or used containers of paint, thinners, solvents, or other flammable materials and pyrotechnics, will not be stored aboard preserved watercraft.

(a) Paint, thinners, solvents, etc. Open or partially used containers of flammable materials shall be removed from the craft by preserving activity. Disposal shall be by approved methods.

(b) Pyrotechnics. These shall be inventoried, boxed/packaged using an approved method (identified as belonging to craft) and removed from the craft for storage at the appropriate armory/ASP.

(c) The two oxygen and two acetylene cylinders normally supplied empty as part of the BII, shall be filled to capacity and placed in an upright position in the paint locker and bosun's store on the deck of the vessel. For safety reasons, the oxygen and acetylene storage bottles will be separated with one type stored in the paint locker and the other in the bosun's store. These cylinders shall be replaced every three years, during cyclic maintenance.

(5) Machinery and miscellaneous equipment covers. Normally, machinery and miscellaneous equipment exposed to the elements are enclosed and protected with dehumidified air and/or sealed with pressure sensitive tape, glue, strippable and bituminous coatings. In lieu of performing the above, machinery and miscellaneous equipment will be protected from the elements with covers manufactured from Herculite.

(a) The Herculite, a commercial trade name for Nylon Chloroprene, Color 36440 light gray, covers shall be provided by the activity or organization. Research reveals that Herculite is the best material to use for covering machinery and miscellaneous equipment exposed to the elements. The Herculite cover will breathe a small amount of air and will provide circulation within the cover.

(b) The Herculite covers will be manufactured with grommets and nylon draw strings to secure the cover to machinery and miscellaneous equipment.

(c) It is the responsibility of the storage activities and organizations to lift the actual dimensions from the watercraft for each cover to be fabricated by local vendors.

(6) Plywood blanks. Blanks are normally used in preservation procedures to introduce dehumidification to a vessel. They are normally sealed with pressure sensitive tape, glue, or strippable and bituminous coatings over large openings penetrating the dehumidified area which are not air tight. It is the responsibility of the storage activity/organization to lift the actual dimensions from the watercraft for each blank to be fabricated and to design, procure and install the simple quick-acting dogging devices or strongback securing devices.

(7) BII. Boat sets are provided for each watercraft as a minimum authorized requirement for the operation, maintenance, health, safety, and welfare of the crew. All vessel operating equipment, operating supplies, repair parts, and accessory items will have been previously inventoried, replenished, re-preserved, and repackaged by the storage activity/organization. The storage activity/organization will also have had previously re-stowed on each vessel all items in their appropriate stowage brackets, bins, lockers, and storerooms, except accessory items normally stored on the exterior (fire hoses, nozzles, fire axes, spanner and dog wrenches), which shall be tagged with identification/location and stored inside the dehumidification zone. At KNB, heat sensitive items will be marked and packaged by vessel accordingly and stored in the 10K building. Refer to the appropriate Common Table of Allowances (CTA) for Army vessels, Table of Distribution and Allowances (TDA), vessel technical manuals (TMs), and/or boat set listings for the authorized items and items

and quantities. All vessel technical manuals, lubrication orders, drawings, support publications and operating logs and records shall be inventoried, replenished, and stowed in lockers aboard the watercraft.

(8) Gaskets, packing and fasteners. New gaskets, packing, seals and fasteners in good condition shall be used during reassembly of equipment upon completion of preservation. This procedure does not provide for openings in fuel, raw water, or fresh water systems to D/H areas.

(9) Fresh water chlorination. It is the responsibility of the storage activity or organization tasked to prepare watercraft for storage to provide and store chlorometric test kits and calcium hypochlorite technical (HTH), face shields, and rubber gloves for use on board watercraft. The calcium hypochlorite technical (HTH) will be stowed in a cool dry place inside the watercraft.

(10) On dry stored watercraft, the packing will be removed from the stern glands and stowed in a convenient position alongside in the engine room ready for installation at activation.

SECTION XIV. MEDICAL EQUIPMENT

5.15 SCOPE

This section describes the policy and procedures for the preparation, preservation, storage, and maintenance required to place Medical Equipment Sets (MESs), Medical Materiel Sets (MMSs), Medical Recommended Stockage Lists (MRSLs), and Dental Equipment Sets (DESs) in APS. AR 40-61, Medical Logistics Policies, governs all aspects of the Medical Assemblages Program.

a. Major assemblages. The medical assemblages stored in APS contain an aggregation of supplies and equipment. Each assemblage is designed and developed for a specific purpose and identified by a single NSN. The NSN, nomenclature, and descriptive data of all assemblages in APS are placed on the exterior container for quick and easy identification. A packing list and list of initial shortages is furnished with each assemblage. Packing list can be found inside the packed containers.

b. Initial preservation, packaging, and packing. The initial preservation and packing of items will be done at an assembly depot, APS land-based site, or the Combat Equipment Battalion-Hythe. Packaging will be in accordance with military packaging requirements prescribed in MIL- STD 2073-1 E(4), Standard Practice for Military Packaging. The methods used for packaging provide ready accessibility to facilitate use or to maintain the assemblage in a serviceable state. All major medical assemblages are packed in reusable containers.

c. Long-term storage (LTS). Medical equipment stored in assemblages will be prepared for LTS and packed in accordance with appropriate military specifications for packaging and will be subjected to a cyclic surveillance program as prescribed in Appendix M of AR 702-18, Materiel Quality Storage Standards Policy for SL Materiel. This equipment is packed to maximum military protection, which will provide adequate protection to equipment for maintenance cycles not to exceed five years.

d. Maintenance of medical assemblages.

(1) All MESs and MMSs, MRSLs, and DESs that have been placed in APS-3 LTS will require COSIS every 24-30 months unless the sets have been used prior to the scheduled COSIS date. The same equipment pre-positioned at land- based sites will be scheduled for reconstitution per USAMMA established fielding schedules unless the sets have been used prior to the scheduled reconstitution date. USAMMA has the responsibility to reconstitute all APS sets stored in land-based sites, and afloat. USAMMA is responsible for directing of all medical assemblages in APS. USAMMA will reconstitute sets based on the most recent unit assemblage listing (UAL). Combat Support Hospitals will undergo reconstitution/upgrades per USAMMA established fielding schedules. Serviceability inspections and performance testing of equipment will be performed during the reconstitution of the medical assemblages.

(2) APS-3 exclusionary items will require “push packages” to be shipped upon notification of handoff. USAMMA will maintain asset visibility to the component level detail.

(3) USAMMA is responsible to order replacement stores, provide disposition for excess, cross-leveling, and procurement of any new requirements.

e. Storage of medical sets.

(1) CH storage. No additional preservation will be required for MESs and MMSs, which are packed at assembly depots or at APS sites to military packaging specifications.

(2) Weather deck storage. No medical assemblages will be stored on the weather deck.

(3) Non-CH storage. All hospital unit sets and any APS-3 afloat will be packed for LTS in accordance with the following specification.

(a) Conventional mod med sets. These medical equipment sets are packed at assembly depots or APS sites. Packaging is in accordance with level A military packaging requirements, which provide maximum protection

for material under the most severe worldwide shipment, handling, and storage conditions. Components packed within the MESs can be packaged in level A, B, or commercial packaging in accordance with ASTM-D3951, Commercial Packaging, meeting military packaging specifications.

(b) Deployable Medical Systems (DEPMEDS). DEPMEDS materiel sets are packed at assembly depots or APS sites. Packaging is in accordance with appropriate military packaging specifications. The use of a static-free breather dehumidification system will provide adequate protection to materiel packed within DEPMEDS shelters/containers repositioned in a field environment for a period of up to 5 years provided the surveillance and desiccant change procedures are followed. Components packed within DEPMEDS shelters can be packaged in levels A, B, or commercial packaging in accordance with ASTM-D3951 meeting military packaging specifications.

f. Maintenance of DEPMEDS containers.

(1) USAMMA on-site personnel are responsible for ensuring that DEPMEDS containers to be stored are correctly prepared for loading. Accountable Officers are responsible for the surveillance of DEPMEDS containers in APS storage.

(2) Ensure dunnage, beneath ISOs and MILVANs, support all four lower ISO fittings, while off-loaded.

(3) Medical logistics personnel are responsible for the maintenance of medical materiel stored in each ISO shelter/MILVAN prior to placing in storage. During maintenance cycles, inspect all medical materiel for damage. Recharge the dehumidification systems as required. Humidity indicators shall be inspected at intervals no longer than monthly.

(4) Procedure for recharging the Static-Free Breather System. Several procedures can be used on DEPMEDS modules, however, use only the following procedures when recharging the static-free breather system. If container does not have static-free breather system installed, use only those steps, which apply.

(a) Step 1: Seal external static-free breather tube opening with ASTM-D5486, type IV, tape.

(b) Step 2: Close vent cover on personnel door (ISO shelter only).

(c) Step 3: Remove old caulking material from around door and open.

(d) Step 4: Open breather drum and remove nylon bag with saturated desiccant.

(e) Step 5: Remove mesh bags containing draw down desiccant.

NOTE

Replace desiccant in the static-free breather system as quickly as possible, preferably on a day with low RH.

(f) Step 6: Place large open mesh nylon bag in breather drum. Fill bag with 50 pounds of dry silica gel desiccant (MIL- D-3716, type 1, grade H, NSN 6850-00-616-9146). Evenly distribute the desiccant over the trivet area providing good contact around the inside of the drum. Close and tie the top of the bag with cord.

(g) Step 7: Replace drum lid and secure it in place. Ensure flexible ducting is securely attached to drum adapter plate and the module adapter plate.

(h) Step 8: Fill 4 open mesh nylon bags with 25 pounds each bagged desiccant (MIL-D-3464, NSN 6850-00-264-6572) as a static load to initially dehumidify the air (100 pounds total). Tie filled bags at both ends and suspend horizontally within the container. If bags cannot be suspended within the container, arrange bags allowing the maximum flow of air around desiccant. Under no circumstances, pack desiccant in containers prohibiting air flow around the desiccant bag. If the container does not have a static-free breather installed, use 200 pounds of bagged desiccant.

(i) Step 9: Close and secure personnel door.

(j) Step 10: Seal doors using procedure in paragraph f(5), step 11 for ISO shelters or paragraph f(6), step 9 for MILVANs.

(k) Step 11: If the container is an ISO shelter and was expanded for any reason, follow the procedures in paragraph f(5) to seal the container. Door vent cover on the ISO shelter must remain closed during the draw down.

(l) Step 12: The draw down phase requires 48 to 72 hours to complete. Check the four-spot humidity indicator. On the ISO shelter this requires opening the personnel door vent cover. The indicator shall show a reading of 30% or less. If the reading is greater than 30%, re-close the vent cover (ISO shelter only), wait another 24 to 36 hours, and check again.

(m) Step 13: When the readings are 30% or less, activate the static-free breather by removing the tape from the exterior static-free breather tube opening. After removing the tape from the breather vent, cover the vent opening with a 4- by 4- inch piece of wire screen or nylon mesh material. Tape the material in place using

ASTM-D5486, type IV, tape to prevent insects from entering the breather tube. On ISO shelters the door vent cover where the static-free breather vent is located must remain partially open allowing for airflow.

(5) Procedures for the preparation of shelters, expandable 1-sided, NSN 5411-01-124-1377 and 2-sided, NSN 5401- 136-9838 for long-term storage are as follows.

(a) Step 1: Cover the ventilation filters inside the cargo doors, utilizing MIL-PRF-131 barrier material cut to size 23-1/4 by 23-1/4 inches. Secure the barrier materiel with 2-inch wide ASTM-D5486 type IV, tape.

(b) Step 2: Jack up the module to a sufficient height to seal cracks between module floor and lower ISO fittings at all four corners of the module with silicone sealant, type MIL-A-46106.

(c) Step 3: Apply a 6-inch strip of Herculite material, type 1, class 3, NSN 8305-00-226-1065, over the full length of the rubber seal along the top edge, leaving approximately 1/2-inch slack. This slack is required to allow for side panel stress when modules are being transported. Secure the Herculite material with 3-inch tape NSN 7510-00-926-8939, 3M, number 481.

(d) Step 4: Seal openings at the four corners between the top and bottom ISO fittings utilizing 3-inch strip of Herculite material leaving 1/2-inch slack to allow for side panel stress, secure Herculite material with tape referenced in Step 3.

(e) Step 5: Apply a base coat conforming to MIL-PRF-6799, type II, class 1, NSN 8030-00-721-9380 over the tape and the Herculite. This base coat shall be a minimum of 12 mils thick (wet measure). It can be applied with a brush or a paint roller. Extend this coating a minimum of 1-inch beyond edge of tape. After allowing the base coat to dry, apply a top coat conforming to MIL-PRF-6799, type II, class 6, NSN 8030- 01-181-6269.

(f) Step 6: Load ISO shelter with required medical materiel.

(g) Step 7: Install the static-free breather using the following procedures.

1. Using a Number 2 Phillips screwdriver, remove the retaining screws and ventilation filter from inside the personnel door. With rubber gasket in place, replace the filter with the adapter plate furnished with the static-free breather. The plate is to provide a mount for the outside vent adapter and RH indicator plug. Place the 4-1/2 inch portion of the adapter tube inside the shelter. Cover the exterior tube opening with a 4- by 4-inch piece of wire screen or nylon mesh material. Utilize tape or hose clamp to secure the screen. This prevents insects form entering the breather tube.

2. Open the vent cover on the personnel door. Utilizing A-A-1936 contact adhesive, glue a 5- by 5-inch one-eighth inch thick rubber gasket of ASTM-D1056, grade 5BE7, NSN 9320-00-824-8816, or equivalent, to the inside center of the vent cover. This is necessary to close off the free breather during the draw down phase of dehumidification.

3. Position the free breather drum on the floor of the shelter near the door and secure in place using web straps or heavy wire.

4. Open the breather drum and remove the drum lid adapter plate, 6 feet of flexible ducting, hose clamps, and hardware. With the rubber gasket in place, mount the adapter plate to the lid of the free breather drum with the bolts and nuts provided. Connect the flexible ducting between the drum adapter plate and the module adapter plate and secure both ends with the hose clamps provided. Close the vent cover on the personnel door.

5. Step 8: Charge the static free-breather system following the procedures in paragraph f(4).

(h) Step 9: Close and secure personnel door.

(i) Step 10: Seal around doors using the following procedures.

1. Insert nylon rope, NSN 4020-00-263-3483 or equivalent, into gaps around doors. This rope will keep the silicone sealant from contacting the neoprene door gasket. Insert single strands or double widths according to the width of the gap. Leave a 2- to 3-inch length of rope loose at a bottom corner to aid future removal.

2. After inserting rope, apply silicone sealant, type MIL-A-46106, over rope to form a complete seal. Ensure that sealant does not contact rubber door gasket. Otherwise, damage to the gasket may result when removing the sealant.

(j) Step 11: Complete draw down procedures in accordance with paragraph f(4), steps 12 and 13.

(6) Procedures for installing a static-free breather into a MILVAN.

(a) Step 1: Using a 3-inch hole saw, cut a hole in the MILVAN's right side, nine inches from the metal door frame, and nine inches down from header at the top of MILVAN. A 1/2-inch portable electric drill may be used for this procedure.

NOTE

Preferred method for cutting 3" and 1" holes in MILVAN wall is to use a hydraulic knock out set if available.

(b) Step 2: From inside the MILVAN, place adapter plate through the 3-inch hole and mark location for the installation bolt holes. Drill four each 9/32-inch diameter holes through the MILVAN wall. With gasket in place, attach the adapter plate to the MILVAN wall with four each 1/4-inch by 3/4-inch bolts. The same adapter plate used in the free breather drum lid is utilized for this application. The 1-inch length of metal tube will extend to the outside. Seal the external tube opening with ASTM-D5486, type IV, tape. Seal contact area between tube and external MIL VAN wall with caulking compound.

(c) Step 3: Using a 2-inch hole saw, cut a hole in the 1/4-inch plywood inner liner inside the MILVAN, 24 inches from top, directly below the adapter plate.

(d) Step 4: Using a 1-inch hole saw, cut a hole through the outer wall centered inside the 2-inch hole that was cut in the plywood inner liner in Step 3.

(e) Step 5: Install the 4 spot humidity indicator (NSN 6685-00-618-1822) in the 1-inch hole. Seal contact area between indicator and wall with silicone sealant.

(f) Step 6: Load MILVAN with required medical materiel.

(g) Step 7: Place free breather into the MILVAN. Place the breather drum on the floor of the MILVAN near the wall vent. Secure the breather drum in place with heavy wire or nylon web straps. Thread the wire or straps through the strap loops attached to the breather drum. Connect the flexible ducting hose between the breather and wall adapter plates. Secure at each end with hose clamps.

(h) Step 8: Follow procedures in paragraph f(4) to charge the static-free breather system.

(i) Step 9: Close and secure MILVAN doors. Utilizing caulking gun (NSN 6120-00-293-3208), apply a bead of silicone sealant, type MIL-A-46106, around the outside edge of the rubber door seals. Smooth the compound flush with the rubber seal. In extreme cold weather, the caulking compound may require warming prior to use.

(j) Step 10: Complete draw down procedures in accordance with paragraph f(4), steps 12 and 13.

(k) Step 11: Fabricate a 14- by 11-inch rain cover for the external breather tube. This cover may be fabricated from a variety of materials. A thin sheet of steel or aluminum is preferred, but weather-resistant fiberboard or 1/4-inch exterior grade plywood may be used. Secure cover in place at an angle over the breather tube utilizing ASTM-D5486, type IV, tape.

(7) Table 5-6 is a list of items required for recharging each static free breather system.

Table 5-6 Materials for Recharging Static Free Breather System

Quantity	Materiel	NSN/Part Number
1 each	4 spot color-change humidity indicator disc	3456P – fits SAE AS26860 type humidity indicator assembly
2 each*	Multi-purpose silicone sealant,MIL-A-46106	Dow Corning #732
100 pounds	Bagged desiccant, MIL- D-3464	6850-00-264-6572
50 pounds	Silica desiccant, MIL-D-3716, type 1, grade H	6850-00-616-9146
1 each	Bag, nylon, 58” x 36”	Fabricated item
4 each	Bag, nylon, 22” x 60”, with ties	Fabricated item
* Additional silicone sealant needed for ISO shelters along with nylon rope, NSN 4020-00-263-3483		

SECTION XV. AVIATION & MISSLE EQUIPMENT

5.16 DETAILED PRESERVATION REQUIREMENTS

a. Store items per equipment TMs and load drawings.

b. Aircraft. Presently aircraft are not authorized for APS storage; however, aviation support equipment is authorized.

c. Tool kits and sets.

(1) Non-CH storage. Not applicable.

(2) CH storage. Kits and sets will be biannually inspected for condition and completeness. Components will be cleaned and protected as required. Non-electrical metal components will be wiped with a rag dampened with preservative oil. Components will be returned to and properly positioned in containers or tool box as appropriate.

d. Hydraulic Jacks.

(1) Non-CH storage is not applicable.

(2) CH storage.

(a) Inspect for leaks and damage. Repair as required.

(b) Clean jack with mild detergent and dry thoroughly.

(c) Fully extend jack and lubricate all bare metal surfaces with a clean rag dampened with the type of hydraulic fluid that the jack is serviced with.

(d) Retract jack.

e. Aviation Ground Power Unit (AGPU). All towing, servicing, and preservation of the AGPU will be in strict accordance with TM 1-1730-229-13.

(1) Non-CH storage is not applicable.

(2) CH storage.

(a) Perform PMCS in accordance with TM 1-1730-229-13.

SECTION XVI. CONTAINERIZED MATERIALS
INTER-MODAL TRANSPORTABLE CONTAINERS

5.17 GENERAL INSTRUCTIONS

a. All ASL/Shop Stock items including tools, TMDE, and other related items will be consolidated in inter-modal transportable containers. Items will be, as a minimum, packaged to the highest level as specified in the FEDLOG Packaging Segment. Items already packed level B need not be repacked solely to bring it up to level A. They will remain packaged in this manner or may be uploaded, as directed by AMC, USAMMA, ARCENT, MTMC, and/or ASC for consolidation purposes. Heavier items (70 to 200 lbs.) may be packed in weather-resistant, triple-wall, ASTM-D5168, Class CBWR, fiberboard boxes, or in wood boxes (wire bound, nailed, or plywood). All items over 200 pounds shall be packed in wood boxes. Limited quantities of ASL and Shop Stock are classified as HAZMAT. All HAZMAT will be segregated, stowed, and secured per Title 49 CFR 176.5 and the International Maritime Dangerous Goods Code.

b. Critical surfaces are those providing closeness of fit or surfaces involving motion while in contact with another surface or surfaces. Items that have critical surfaces are considered critical items. Examples of critical items are automotive intake and exhaust valves, camshafts, crankshafts, and antifriction and friction bearings. Examples of non- critical items are axe heads, pry bars, track pads, and tow cables.

c. All containerized items will be properly blocked and braced within the container to prevent movement and damage while afloat.

d. All ASL, Shop Stock, BII, and miscellaneous items which are part of APS Program inventories will be tagged, labeled, or stenciled with official identification of the item including nomenclature, NSNs, and line item numbers (LIN) when available and applicable. Appropriate packing lists will be included. A minimum of two lists will be placed on the outside of the container and three lists will be placed in the container.

e. In general, petroleum, oils, and lubricants (POL) will be unit packed and palletized prior to being shipped to the storage location or port for loading. POL products not containerized when received will be properly consolidated in barges or inter-model containers prior to being placed in storage.

f. Meals Ready to Eat (MRE) will be palletized with 48 cases per pallet. The palletization pattern is contained in MIL-STD-147. More specifically, each pallet will contain 4 tiers of 12 cases. When loaded in inter-modal containers, pallets will be stacked two high. Unitization of these loads may be with strapping or wrap. If a wrap is used, the top shall be left open to facilitate air circulation.

g. Due to the uniqueness of loading barbed and concertina wire, special framing must be applied to accommodate stacking, if required.

h. Construction materials shall be containerized in inter-modal containers whenever practical and possible for loading aboard APS-3 vessels. Loading configurations will be developed at the consolidation point or at the port Standard consolidation practices will be utilized to develop the load pattern. The goal is to minimize the amount of containers that must be used.

SECTION XVII. SUPPLY CLASS V

5.18 GENERAL INSTRUCTIONS

a. Ammunition and explosives will be maintained in accordance with established regulations including DA Pam 742-1, AR 702-6, and guidance contained in the Munitions History Program (MHP). Specific directions for approving ammunition for prepositioning afloat are contained in DA Pam 742-1.

b. All supply class V will be packaged in accordance with appropriate packaging drawings and palletization procedures. Packaging drawings may be obtained by contacting CCDC Armaments Center, Rock Island or AMCOM packaging office mailbox address: usarmy.redstone.amcom.mbx.immc-packaging-data@army.mil if not available by other means and palletization procedures reference paragraph e. below for link; palletization procedures can be located in the U.S. AMC drawing index 1948-75-5.

c. Follow all special supply policies and procedure for all Joint Munitions Command (JMC) and Aviation and Missile Command (AMCOM) managed supply Class V that is prepositioned afloat. POC addresses are: JMC – HQ JMC, ATTN: AMSJM-QAS, CCDC Armaments Center Rock Island, and AMCOM - HQ AMCOM, PEO MISSILES & SPACE, ATTN: SFAE–MSL-LO, Redstone Arsenal, AL 35898-5239.

d. Maintain all APS-3 ammunition and explosives (A&E) under environmental controls in paragraph 2-2b.

e. Supply class V that is prepositioned at land-based sites will be stored in accordance with appropriate storage drawing procedures. These procedures can be located in the U.S. AMC Drawing Index 19-48-75-5, https://www3.dac.army.mil/DET/dapam/toc.html.

f. Load all APS-3 A&E, if possible, on M3 series flatracks (container roll in/out platforms (CROP)) and roll in a container. Some missile systems are too big for CROPs.

CHAPTER 6
QUALITY ASSURANCE

SECTION I. GENERAL

6.1 POLICY

a. When required inspection, calibration, and maintenance have been performed and materiel placed in storage, this section applies until equipment is issued. The functions outlined herein are the minimum for control and effective results.

b. There will be an established and identifiable in storage inspection and maintenance program for all APS materiel. The program will provide for the necessary inspection, test, and surveillance actions set forth in the equipment's technical manuals and this manual.

c. When equipment is properly preserved and placed in storage in the prescribed readiness status, maintenance will, in the majority of cases, only be accomplished at the end of the storage cycle. Certain materials may "age out" or components fail during test or exercises, and because of this, maintenance skills and resources above the organizational level must be accessible. Maintenance is also required to accomplish essential modifications as the need arises. A combination of cyclic maintenance, 30-day visual surveillance, special exercising requirements, and dehumidified storage is designed to ensure that equipment meets all operational requirements for reporting operational readiness in accordance with AR 220-1, Army Unit Status Reporting and Force Registration-Consolidated Policies.

d. For watercraft, the COSIS program will ensure the exterior surfaces and deck-mounted equipment are maintained in good condition. All watercraft will be sealed and dehumidified with the RH set at 40% +/- 10%. External inspection will occur on a monthly basis to include removal of all protected covers for equipment inspection. Covers will be replaced and secured after inspection. All signs of DH sealing, leaks or corrosion will be annotated and corrective action undertaken. Internal inspection on wet stored vessels will occur on a monthly basis. All ingress of water will be annotated and corrective action undertaken. DH seals will be inspected and corrected where necessary. Vessels stored in a warm state of preservation (per chapter 5-13), will have all main engines and bow thruster propulsion shafts rotated during quarterly maintenance checks. The dry stored vessels (LCM8, ST, SLWT, MWT, CF) will have screw shafts rotated at least 2.75 revolutions, leaving the shaft 90 or 270 degrees from its start point. Cutlass bearings will be lubricated per the system technical manual. All vessels stored in a long-term state of preservation (per chapter 5-14), will have main engine and bow thruster propulsion shafts rotated IAW with guidance herein for dry stored vessels. A strap wrench or chafing gear will be used when turning the shafts to prevent permanent damage. LCU2000 bow thruster drive shafts and main propulsion shafts will be rotated at least 2.75 revolutions leaving the shaft 90 or 270 degrees from its start point. Large tug main propulsion shafts will be rotated at least 2.75 revolutions leaving the shaft 90 or 270 degrees from its start point. Quarterly propeller shafts on dry stored LCM8, ST and SLWT will be rotated at least 2.75 revolutions leaving the shaft 90 or 270 degrees from its start point, while lubricating the cutlass bearings. Maintenance on watercraft is unlikely to be required within each scheduled 3-year cycle unless activated for exercise, contingency, or storm/unusual damage occurs. Maintenance may be required to accomplish essential modifications where applicable. In this instance a team from Combat Equipment Battalion - Hythe or a Shipyard contractor may be used to accomplish the MWO new watercraft maintenance cycle.

e. The COSIS program for modular causeway system ISOPAKs will ensure that the 220 ft. end rakes will be removed from the 40 ft. section and inspected every 36 months. All signs of corrosion will be annotated and corrective action undertaken. Corroded areas shall be cleaned, prepared, and repainted with the applicable type and color of paint compatible with existing system. A pressure drop test IAW TM 55-1945-205-24-1-1 will be conducted during this maintenance cycle, and all deficiencies will be corrected. A convention for safe containers (CSC) inspection will be conducted and all ISOPAKs will be certified every 30 months. For modular causeway system ISOPAKs, the COSIS program will ensure the exterior of ISOPAKs are inspected monthly. All signs of corrosion will be annotated and corrective action undertaken. Corroded areas shall be cleaned free of corrosion and repainted with the applicable type and color of paint compatible with existing system. Once within every three year period, the two 20 ft. ends will be removed from the 40 ft. mid piece of all ISOPAKs in storage at Kuwait Naval Base (KNB) and Yokohama North Dock (YND) and all operational parts will be tested, repaired where applicable and re-preserved.

f. At YND, diver services will be obtained/procured to clean the hulls of wet stored vessels each six months to prevent excessive airline growth accumulation.

g. At KNB, the vessels will be lifted on the Syncrolift and high pressure water blasted to clean the hulls of wet stored vessels each six months to prevent excessive marine growth accumulation with the exception of the 115 ton floating crane, where diver services will be obtained/procured to clean the hull each six months to prevent excessive marine growth accumulation. Divers can be obtained for wet stored vessels if Syncrolift is unavailable for any reason.

SECTION II SURVEILLANCE

INSPECTION

6.2 OVERVIEW

a. A materiel surveillance program shall be administered to maintain an effective COSIS program. Visual inspections are to be simple and unencumbered by disassembly actions or other time-consuming requirements (DA Form 2404 will be used to record faults). The primary purpose of the inspection is early detection of deficiencies that may be indicative of problems that are more serious or that may lead to more serious problems if undetected or not corrected. Visual inspection of each item in storage is required at least every 30 days.

(1) If tires are flat, they shall be repaired immediately. If this is impossible, flats will be noted on the inspection report and repaired at the first opportunity.

(2) Leakage of coolant (e.g., keel coolers on LCU 2000), oil, or grease that is not sufficient to warrant immediate maintenance action shall be noted on the inspection check sheet and be a special item for review during subsequent inspection.

(3) Particular attention shall be paid to condensation, water leaks, and plugged scuppers body drain holes. Coolant and lubricant levels shall be checked the first 30 days after storage. Checks during subsequent inspections are not required unless there is visual evidence of leaks or adequate reason to suspect contamination or internal leaks.

b. Surveillance includes inspection of CH capabilities to detect evidence of malfunction of dehumidification machinery, controls, or recording devices, and damage to or failure of structures or covers, and reporting of it for corrective action

c. Surveillance also includes those actions necessary to prevent and detect security deficiencies and recommend corrective actions relative to incidents of pilferage and sabotage.

d. Surveillance of equipment requires knowledge of the visual characteristics associated with materiel failure or deterioration. The following are some of these characteristics.

(1) Leakage or seepage of lubricants. This may be caused by overfill or excess lubrication, or internal pressures resulting from clogged vents or defective seals or gaskets. Thorough analysis is required before conclusions are reached and repair is requested.

(2) Appearance of red, brown, black, or white precipitates around or on the surface of metallic items. The precipitate may or may not be accompanied by the visual evidence of moisture. This is usually evidence of corrosion in process. Recognition of the appearance of corrosion is contained in TB 43-0213, Corrosion Prevention and Control for Tactical Vehicles, including Rust Proofing Procedures For Tactical Vehicles and Trailers (see also Table 6-1, pg. 6-4). This TB also contains some repair procedures. Report all repetitive corrosion problems to ASC for TACOM equipment, copy furnish TACOM-WARREN, Packaging, AMSTA-LCL-IA, Warren, MI 48397-5000.

(3) The visual or scent evidence of fungus, mildew, or microbiological attack on materials. A strong musty odor may be evidence of such attacks.

(4) Evidence of insect or rodent infestation in organic materials such as food, fabric, cellulosic paper, and fiberboard.

(5) Effect of natural environmental elements such as ozone and ultraviolet light. Deterioration induced by ozone is indicated by cracking of surfaces of rubber items such as tires, pontoons, and hoses. Cracking will be most severe at points of stress such as bends. The effect of ultraviolet light is found in the fading of paints and discoloration and crazing of plastic material.

(6) Soft or flat tires can be caused by manufacturing defects, leaking tubes, or defective valves. The major cause of premature tire failure is porosity (e.g., air migration, slow leaks, and permeation), which allows some air to escape. Some tires will continually lose air pressure while others require that the tire get hot. It is imperative to maintain proper air pressure in all tires.

(7) Deterioration of supply class III materials used in preservation of equipment often can be seen. The mixture of water in oil (emulsification) may also be seen as milky or tan. Dulling, hardening, or a complete loss of coating may evidence drying or evaporation of preservation. Questions concerning preservative supply class III products or lubricants and fuels shall be addressed to the AFSC.ASC. Questions concerning preservative

supply class III products or lubricants and fuels shall be addressed to TACOM, CCDC GVSC, Petroleum and Water Business Area, Packaging, AMSTA-LCL-IA, Warren, MI 48397-5000, DSN786-4207 thru the TACOM War Reserve Office, AMSTA-LC-CIPRW, Warren, MI 48397- 5000.

(8) Delaminating, cracking, or complete breaks in barrier materials, caulking, and/or tape.

(9) Leakage of any refrigerant from air conditioning must be immediately repaired to comply with the Clean Air Act and host nation environmental laws and regulations. All repairs must be accomplished by the Clean Air Act, Section 608/609 certified technicians or equivalent, using approved refrigerant recycling equipment. For APS3 Stocks afloat, where feasible, the defective AC refrigerant must be extracted and captured.

e. Watercraft stored at Yokohama North Dock and Kuwait Naval Base will have a designated contractor performing COSIS and maintenance on a continual basis.

f. Inter-modal containers will be checked weekly for evidence of leakage and/or pilferage. Deficiencies in the containers will be corrected immediately and ASC and/or USAMMA notified of the problem and action taken. Containerized supplies shall have sample inspections as determined by the ASC or USAMMA and Table 3-5. No ammunition or medical container aboard ships will be opened without explicit direction from DA G-4 or USAMMA Commander.

g. Humidity indicators on desiccated containers will be checked monthly subsequent to CH failure for evidence of moisture content in packages and saturated desiccant. Report any discrepancy.

h. Absorbed Glass Mat (AGM) and activated flooded lead acid batteries will be maintained in accordance with ASC Battery Maintenance Management Plan. A cold battery (below 40-degrees F) will not readily accept a charge. When a fast charger is connected to cold battery, the charging rate will be low at first, and then increase as the battery temperature increases. It is recommended to recharge the M1 tank battery six-pack after each maintenance cycle of approximately 6 months. Battery charger model 2937-4419 will charge 1, 2, 4, or 6 military batteries as they are configured in the vehicle. The M1 tanks are to be charged a minimum of 3 hours. After the 3-hour minimum charge the batteries are to be tested with the Medtronic’s Battery Tester "MICRO 400" or equivalent. The M1 batteries after a minimum of 3 hours shall TEST "GOOD" using the MICRO 400 tester. If the M1 batteries have been deeply discharged for some reason, run the battery charger for 10 hours maximum. Battery charger model 29374419 may also be used to charge a trailer battery like the M-1000 Trailer, Transport, H.E. 700 Ton. The battery may be charged using the 12-volt selection on the charger model 2937-4419 or run the APU for 30 minutes. For on-going surveillance diagnostics the ASC Battery Maintenance Management Plan suggest the 490PT for conductance testing or equivalent load testing equipment. The 490PT is recommended for both afloat and land base storage use.

i. Weapons containers and weapons cabinets will be checked on a daily basis, or as directed.

j. Fire control devices shall be checked for deterioration every 180 days.

k. Surveillance of supply class V and storage locations shall be performed IAW DA Pam 742-1 and applicable missile Supply Bulletins and Technical Manuals.

l. Delamination of ballistic glass or any condition likely to degrade protection level. Periodic inspections performed according to the applicable Technical Manual will identify those items with an expiring SL, which will require replacement or extension.

m. Maintenance of ammunition and munitions will not be conducted on board ship.

Table 6-1. Stages of Corrosion

Stages of corrosion	Description	Painted surfaces	Exterior machine surface (functional and nonfunctional)	Interior machine surface (functional and nonfunctional	Remarks
I	Discoloration staining; no direct visual evidence of pitting, or other surface damage.	This condition does not require immediate corrective action.	This condition does not require immediate action other than reprocessing as necessary	This condition does not require immediate action other than reprocessing as necessary	Use as is, except in the case of elevating cylinders subjected to functional wiping action. Remove corrosion using crocus cloth
II	Loose rust, black or white corrosion accompanied by minor etching, and pitting of surface. No scale or tight rust.	Clean by any applicable process. Touch up with paint as originally applied.	Clean, exercise, and reprocess	Clean, exercise, and reprocess.	In the case of elevating cylinders subjected to functional wiping action, remove corrosion by use of crocus cloth.
III	Rust, black or white corrosion accompanied singularly or in - combination with etching, pitting, or - more extensive surface damage. Loose or granular condition.	Clean by any applicable process. Touch up with paint as originally applied.	Clean, exercise, and reprocess	Exercise and reprocess	This condition would have minor effect on fit or wear of paint or component but would permit use without reprocess. Does not apply to such items as instruments (electrical or manual) and critical surfaces that are necessary to effect a seal against pressurized liquids.
IV	Rust, black or white corrosion progressed to the point where fit. wear, function life of the item have been affected. Powdered or scaly condition with pits or irregular areas of material removed from surface of item.	Clean by any applicable process. Touch up with paint as originally applied.	Replace or rework parts and components involved.	Replace or rework and components involved.	This condition will require action as indicated.

SECTION III EXERCISING

6.3 REQUIREMENTS

a. Exercising equipment in storage. The primary purpose is to determine the degree of functionality of the item, prevent accelerated deterioration of component surfaces and seals through distribution of lubricants and oils over surfaces normally lubricated during equipment operation, and ensure that the operational capability of the item is maintained. See Table 6-2 for general guidance for non-cyclic maintenance exercising. See table 6-3 for general guidance for APS-3 specific maintenance cycles.

NOTE

Prior to slave starting any vehicle, make sure everything that can be turned off is turned off. This is imperative to prevent power spikes, which can damage components (e.g., diodes in the CTIS Control Assembly will be damaged by power spikes).

b. General Exercising Requirements. Exercising equipment will be integrated into, and made a part of, the cyclic maintenance program. Constraints aboard ships and warehouses limit, and in some cases eliminate, the ability to fully exercise equipment. Low ceiling heights, close storage configurations, and inaccessibility, are the main constraints. It is essential that the cyclic maintenance schedules include an exercising program to the fullest extent possible. Inability to completely exercise equipment during a cycle must be documented and maintained with that piece of equipment. If a system on an operational vehicle, e.g., hydraulic unit, is not used on a regular basis, that system will be exercised once every 90 days.

NOTE

APS-3 VERPs are scheduled every six months for all equipment stowed aboard ship; most hydraulics cannot be exercised aboard ship.

(1) The PMCS tables in the operator (-10) and organizational (-23 or 24) manuals will be used for vehicles being evaluated during the APS maintenance cycle.

(2) When the PMCS for a specific vehicle does not specify time (period of operation), speed, or distance, the following guidance will be followed.

(a) Perform “before” operations checks. Start engine and run for a period sufficient to bring engine and lubricants to normal operating temperature prior to start of testing. If there is no prescribed warm-up time, engines will be allowed to run until they reach normal operating temperature or a minimum of 20 minutes.

(b) During testing, the vehicle will be operated in all power ranges, forward and reverse. Speeds and engine rpm normal to operation of the vehicle will be attained during the testing. Make several right and left 90 degree turns. Make several hard braking stops without skidding. While exercising, and when it is safe and convenient, operate all other functional components and perform all during and after operational checks.

(c) Service and parking brakes will be tested in accordance with PMCS tables in the applicable TMs. Trailers having brake and light systems will be hooked up to a prime mover and subjected to brake and light testing. Any fluid on lines, drums, or tires prior to test shall be wiped clean. Visual inspection after testing will disclose whether the system is leaking at the points inspected.

(d) For all track vehicles, test brake holding capability in accordance with PMCS tables in the applicable TM or if not specified, use guidance in paragraph 7.4a(5).

(3) All brake systems will be visually inspected (lines, master cylinder, and drums) before and after test for evidence of fluid leakage. Any fluid on lines, drums, or tires prior to test shall be wiped clean to start. Visual inspection after testing will disclose whether the system is leaking at the points inspected.

(4) Check axles and constant velocity joints for evidence of lubricant leaks.

(5) Vehicle-mounted auxiliary and ancillary components, such as winches, pumps, engines, hoists, generators, etc., will be functionally tested every maintenance cycle. Cables (e.g., winches and wrecker hoists) will be unwound and examined for crushed sections and broken strands. The only approved exceptions are running tar through the asphalt spreader and concrete through concrete/ cement mixers to check the operation of the equipment. This type of operation will be waived through the waiver process (see Chapter 1).

NOTE

Leave the M9 ACE Main Winch Cable unpaid due to the weight causing the bearing to warp and seal crack resulting in an Inoperable winch drum.

c. Tank/automotive vehicles/power-driven equipment.

(1) Afloat. Each self-propelled vehicle in CH storage aboard vessels will require both battery terminals be re- connected to be started and exercised every six months during the afloat period. Engines will be allowed to operate at a high idle of 1500 RPMs until they reach normal operating temperature, minimum of 20 minutes. This allows adequate recharging of the AGM battery energy that was depleted during the start of the vehicle. With the transfer case in neutral, where appropriate, the transmissions must be manually run through all gearshift ranges. All vehicles will be activated to the extent necessary to power up all systems and subsystems and perform limited technical inspections (LTIs), serviceability/visual inspections and tests, and the required maintenance functions needed to maintain the equipment IAW AR 750-1, paragraph 3-2 throughout each maintenance cycle. Follow appropriate vehicle TMs and all warning plates and decals to ensure safe operation of equipment during exercising. Equipment that is preserved level A aboard the vessels will not be de- processed while afloat unless specifically instructed. Exercised equipment must have the battery terminals disconnected after the exercise.

(2) Land-based.

(a) Combat vehicles. Each vehicle will be exercised at least once every 36 months when stored in a CH environment. Combat vehicles in other than CH storage will be exercised at least once every 24 months for indoor storage, and 18 months for outdoor storage. If vehicles are stored in a non-CH environment, they will be processed to Level A requirements in accordance with appropriate military

specifications. All vehicles will be activated and road tested to the extent necessary to power up all systems and subsystems and perform necessary PMCS, serviceability and visual inspections and tests, and the required maintenance functions needed to repair the equipment at the appropriate maintenance level to established -10/-23 or -24 standards. Prior to return to storage, vehicles will be re-preserved.

(b) Tactical vehicles. Each vehicle in a CH environment will be exercised at least once during the storage period within the respective maintenance cycle. As a minimum, each vehicle in CH will be exercised once every 48 months. Vehicles processed to Level A and stored in a non-CH environment, as detailed on the appropriate EPDS, will be exercised every 36 months for indoor storage, and 24 months for outdoor storage. If EPDS is not available, contact the ASC for a copy of the EPDS. All vehicles will be activated to the extent necessary to power up all systems and subsystems and perform necessary PMCS, serviceability and visual inspections and tests, and the required maintenance functions needed to repair the equipment at the appropriate maintenance level to established -10/-23 or -24 standards. Prior to return to storage, vehicles will be re- preserved.

CAUTION

If an engine is not in continuous use, oil will run off cylinder walls, piston rings, main bearings, connecting rod bearings, crankshaft, gears, and other parts that normally get lubricated during operation. When the engine is started, before these surfaces get oil, the metal-to-metal contact will cause wear. To keep this wear at a minimum, ensure oil pressure is shown on the pressure gauge prior to starting the engine. This can be accomplished by using the starter to turn the engine with the throttle in the fuel OFF position or by covering the air intake with an air restrictor cover to prevent the engine from firing. Operator manuals shall be consulted to determine unique starting procedures for individual equipment.

NOTE

Only licensed drivers shall operate combat and tactical vehicles. Operators not licensed for specific vehicles can do more damage to equipment during exercising than would occur from not exercising. For example, driving an M1 tank with the parking brake on will destroy the transmission and not following the specific shut-down procedures will destroy the engine.

(c) Commercial equipment and non-developmental items (NDI) equipment. For equipment stored in a CH environment, the requirements are the same as for tactical vehicles in CH storage. For equipment in other than CH storage, the same requirements apply as for tactical vehicles in this type of storage environment, if preservation processing for storage requirements are available, and equipment is processed Level A. If no long-term protection requirements are available, follow the exercising requirements and cycles specified in the vehicle technical manuals. If no requirements are available for processing equipment for long-term storage, contact Headquarters, Field Support Command, ASC, ATTN: SIOEC-CO, Rock Island, IL 61299-6500.

(3) In addition to the general exercising requirements already indicated, the following exercising will be performed for the systems and subsystems identified and in the frequencies and time periods established.

(a) Weapons systems. Turrets and commander's cupolas will be rotated 360 degrees in each direction, a minimum of three rotations (each direction). Main guns will be operated through a maximum elevation/ depression cycle, a minimum of three cycles. Recoil mechanisms will be exercised in accordance with TB 9-1000-234-13 and the appropriate TMs. DA Form 2408-4 shall be annotated after the completion of a recoil exercise. All exercising will be accomplished in place and at a frequency level of 12 Months. The M109 self-propelled howitzer (SPH) requires elevation to maximum QE. The M119A2 Light Towed Howitzer will be inspected and recoil exercised every 90 days IAW TM 9-1015-252-24 and TM 9-1015-252-24P. If restrictions within the warehouse or vessel prevent complete rotation of turrets or complete elevation/depression of guns, they will be rotated or elevated to the maximum extent possible. Main guns will be elevated during rotation if such elevation maximizes turret rotation. The M109 SPH requires maximum elevation. The mast system for the PATRIOT AMG and OE-349/MRC will be exercised three cycles to full 30-meter extension at a frequency of once per 90 days. During every cycle, hold extension for 15 minutes to check for leaks. Additionally, the PATRIOT Radar cooling system will be exercised a minimum of 4 hours every 90 days.

(b) Thermal imaging systems. Power up thermal imaging systems and allow to cool down. If cool down

is not attained in 15 minutes, a cool down light will activate. A DA Form 2407 (Maintenance Request) shall be submitted to maintenance indicating thermal system failure. This requirement shall be performed during cyclic maintenance and time of issue.

(c) Hydraulic Systems. All afloat equipment hydraulic systems in storage will be exercised to the maximum extent possible (given the ship board limitations) every 180 days in conjunction with vehicle start up. CH stored land-based equipment hydraulic systems will be exercised completely in conjunction with the specified CH storage exercising requirements except the following equipment/systems, which will be exercised every 365 days.

NOTE

COSIS on the HIMARS and M270A1 Fire Control System and Launcher Loader Module will be perform by designated CLS Representative.

1. M60/M48 series armored vehicle launched bridge (AVLB) and bridge, armored-vehicle launched: scissoring type, class 60 and 70 will be subjected to three complete launch and retrieval cycles. Follow the PMCS guidance in the appropriate TMs and inspect before, during, and after exercising for failures. Inspections shall include the following:

(i) Engage the clutch assembly and activate the power take-off assembly and check for use of clutch lever operation to indicate proper adjustment of the clutch to ensure there is no clutch slippage.

(ii) Check for noise in the power takeoff assembly to indicate a defective clutch assembly, universal joint, or power take-off assembly.

(iii) Inspect for leaks in the hydraulic system, excessive noise, vibration, or chatter in the hydraulic system, abnormal or excessive heating in the hydraulic system, valve bank controls sticking, filter condition per indicator, high hydraulic pump noise level, hanging or sticking of swivel elbows on tongue cylinder, proper fluid level in hydraulic reservoir, and binding at pivot points during operation.

2. M728 vehicle boom hydraulics and the dozer hydraulic system will be subjected to two complete raise and lowering cycles. See vehicle TM.

3. Forklifts, engineer construction equipment, and other material handling hydraulic equipment will be subjected to two complete raise and lowering cycles. See vehicle TM.

4. M88 series vehicles spade and boom hydraulics will be subjected to two complete raise and lowering cycles. See vehicle TM.

5. Mine Clearance Launcher Hydraulics. Exercise the launcher completely through two cycles of launch and retrieve.

(d) Brake and clutch systems. Hydraulic brake systems on all vehicles will be exercised by pumping the brake pedal a minimum of four times during equipment start-up. This includes all trailer assemblies equipped with hydraulic braking systems. An auxiliary power source will be supplied to the trailers or the equipment de-processed and started and the brake system exercised by the power source. When the functional exercise is performed on vehicles, which have a spring brake, it (spring brake) must be disengaged prior to the check. In most cases, the spring brake is disengaged when the air pressure has reached the minimum operating level. If the spring brake is not disengaged, the brake system will not function correctly. On vehicles with an air-spring brake chamber caging system for the rear brakes (e.g., M939 series), the vehicles must be inspected to ensure the brakes are not caged prior to the functions check to allow operation of the rear brakes. Once the functions check is completed, the air tank/reservoirs must be drained on both air and air-over- hydraulic brake systems to prevent damage to the system. Perform operator PMCS of braking system of combat vehicles and tactical vehicles, according to the applicable technical manual, prior to exercising.

(e) APUs, generators, or other subsystems that contain lead-acid batteries. For subsystems that are preserved for long term storage and contain dry charged batteries no charging or any battery maintenance/servicing is required (see Chapter 7 for special handoff requirements). Subsystems that are operational and contain wet charged batteries must be charged every 12 months for indoor storage, and 36 months for outdoor storage. to extend the SL in climates above 10C, batteries charged/serviced (per paragraph 6.2h), etc

(f) M139 Volcano Mine Dispenser. Launcher rack circuits need to be conditioned annually. The hardware shall be assembled, installed, and tested per Section 2 of TM 9-1095-208-10-1. If any error code 8s (Rack Electronics) occur, the entire system shall be checked per Section 3 of TM 9-1095-208-

10-1. If the error code 8s is isolated to the launcher racks, the launcher rack capacitors shall be replaced per the TM. If replacing the capacitor does not eliminate the error code, then replace the circuit cards in accordance with applicable technical manual.

(g) 120MM mortar: Every 12 months the following shall be accomplished for the 120MM mortar:

1. Unlock and open the clamping support assembly (travel clamp) and perform the following:

(i) Buffer Mechanism. Exercise the buffer mechanism by pulling down (back) on both housing tubes at the same time and then releasing. Repeat two additional times (three times total).

(ii) Traversing Mechanism. Turn traversing handle and move traversing mechanism fully to the left and then fully to the right. Return to an approximate middle position.

(iii) Elevating Mechanism. Turn elevating handle to fully elevate mortar. Turn elevating handle to fully depress mortar.

(iv) Cross-Leveling Mechanism. Turn cross-leveling to fully extend. Turn cross-leveling handle to fully retract. Turn cross-leveling handle to return elevating mechanism to an approximate vertical position.

2. Reposition cannon tube in clamping support assembly by adjusting elevating, traversing, and cross-leveling mechanisms as necessary. Lock clamping support assembly. Reapply preservative/lubricating oil MIL-PRF-3150 to any unpainted surfaces, if needed.

(h) M870A3 Semi-Trailer. For land-based storage, with the gooseneck restrained, exercise the gooseneck once a year.

(i) The M56 and M58 smoke generators will be exercised per the TM 3-1040-282-10 PMCS and the TM 3-1040-285-10 PMCS, respectively.

SECTION IV MODIFICATION WORK ORDERS (MWO)

6.4 APPLICATION

a. MWOs that have been negotiated for equipment in storage will be applied in the following manner:

(1) Emergency and urgent MWOs will be applied while in storage, when possible, or at the first unscheduled issue, contingency, exercise, or scheduled maintenance cycle. Additionally, any Routine MWO that has the possibility to deadline (NMC) a piece of equipment will be completed.

(2) Equipment will not be disturbed for accomplishing routine MWOs unless it meets the criteria described in (1) above. These will be applied at the time of scheduled cyclic maintenance.

b. Advantage shall be taken of imminent inspections, scheduled maintenance, or projected military exercises in planning for the application and verification of MWOs

c. Emergency, Operational and technical SOUs will be completed if it has the potential to cause an NMC condition or deadline a piece of equipment. Additionally any safety message that has the same potential will be accomplished during COSIS. Maintenance actions resulting from the before mention SOUs and safety Messages will be accomplished aboard ship when possible, or during the next scheduled ship maintenance cycle when not possible. All SOU and Safety Messages requiring inspection/maintenance actions will be accomplished prior to handoff to the receiving unit.

d. For all of APS, ISR will immediately be updated with the correct status of equipment based on MWO, SOU and safety message requirements. This is to ensure proper daily/monthly readiness reporting.

Table 6-2. Non-Cyclic Maintenance Exercising Guide

System / Storage	Exercise	Maintenance	Visual Inspection
Combat / Control Humidity Indoor	36 Months	48 Months	30 Days
Combat / Indoor	24 Months	48 Months	
Combat / Outdoor	18 Months	24 Months	
Tactical / Control Humidity	48 Months	48 Months	
Tactical / Indoor	36 Months	48 Months	
Tactical / Outdoor	24 Months	24 Months	
Turret	12 Months	N/A	
APU/Gen Indoor	12 Months		
APU/Gen Outdoor	36 Months		
120mm Mortar	12 Months		
HIMARS / MLRS / PATRIOT System	12 Months		
M88, AVLB, MHE	12 Months		
CL VIII Biomedical Maintenance Significant Equipment / Land-Based Sites equipment	12 Months		

Table 6-3. Non-Cyclic APS-3 Maintenance Exercising Guide

Description	Type	Maintenance	Visual Inspection
Large Medium Speed Roll-On Roll-Off (LMSR)	Vehicles, equipment, & supplies	48 Months	30 Days
APS-3 container ship munitions & supplies	Munitions & supplies	24-30 Months	
Afloat	CL VIII biomedical maintenance significant equipment	IAW ship cargo maintenance cycle	

SECTION V. SUPPLEMENTAL ARMOR KITS STORAGE

6.5 REQUIREMENTS

a. The projected life of a Supplemental Armor/Add on Armor Operational Project is 20 years. To ensure that the kits can be economically and reasonably maintained dictates a higher than OEM packaging requirement. The primary storage location for armor kits is outdoor/open storage where the packaging of the kits is exposed to the elements. Traditional OEM/"best commercial packaging" lasts roughly 12 months. The cost and manpower to re-crate the kits every 12 month would bring an economic burden onto the government and strain storage

location C&A. Supplemental Armor Kits should have SPI developed IAW military packaging standards, using a short life reusable container that meets the most rigorous military requirements and can be used up to ten times. Kit components should be packaged in the order of installation where possible.

b. Non-CH storage

(1) The preservation for the Supplemental Armor Kits shall be as follows: Components that make up a complete armor kit shall be individually packed according to the kit SPI, or, if there is no SPI, in a close-fitting box conforming to ASTM-D6251. Overseas type III, class 2 style A. Blocking and cushioning shall be used as necessary to prevent movement of contents within the shipping container.

(2) Exterior container strapping: ASTM D3953, type 1 heavy duty, finish B (galvanized), grade 2, 1.25 or .75 inch applied IAW ASTM D4675 with two girth wise length straps and two horizontal straps positioned over the top and bottom battens.

(3) Stencil on the top front and front side battens “Remove lag bolts before opening” and “reusable container-do not destroy”

(4) Exterior container MIL-STD-129 marking on length and corresponding width panel.

(a) Include D.O.T “Glass Warning” labels on crates where glass is present.

(b) Marking that denotes crate number shall be place in the lower right-hand corner of the length and corresponding width panel.

(5) Affix a (10” X 12”) “Packing list enclosed” wet pack to the exterior of crate containing the packing list.

(6) In the event armor kits are received in OEM packaging that does not meet afore mentioned packaging specification. The TACOM item manager should be contacted for further instructions. If unable to contact the TACOM item manager:

(a) The armor kits shall be loaded into 20ft ISO containers that meet CID A-A-52032 if re-containerization cannot be accomplished below procurement cost of the containers required.

c. CH storage. Same as Non-CH storage.

d. COSIS/Surveillance

(1) The kits require an annual surveillance of the storage area to ensure there is no structural damage, deterioration, or animal incursion of the wooden crates the kits are stored in. If the kits are stored in a 20 ft. ISO container, the container doors will be opened, greased, exercised, and the kits will be visually inspected before the container is sealed.

(2) Each kit shall be inspected after five years of storage. Crates containing ballistic glass must be opened to check for delamination. Any compromised components will have to be removed, repair, and/or replaced.

(3) If the condition of the crate is found to no longer provide the level of protection to which it was originally created then the kit will have to be re-crated in a newly assemble crate.

SECTION VI. HIGH MOBILITY ARTILLERY ROCKET SYSTEM (HIMARS) & MULTIPLE LAUNCH ROCKET SYSTEM (MLRS M270A1)

6.6 REQUIREMENTS

a. The HIMARS and MLRS M270A1 launcher systems have unique hydraulic mechanisms, which require equipment exercising at a frequency level other than the specified maintenance cycle as listed in Chapter 6 of this TM. The PFRMS Office requested that APS-2 personnel perform specific COSIS on the following equipment: MLRS M270A1 Carrier/Chassis (Bradley Variant) and the HIMARS XM1140A1 Automotive Chassis (FMTV 5-Ton Variant). The requested COSIS maintenance checks will include specific checks that are Before, During, and After Preventive Maintenance Checks and Services (PMCS), to include specific Weekly PMCS checks. These COSIS checks will be conducted every (90) ninety days.

b. The COSIS maintenance checks for the MLRS M270A1 Carrier/Chassis will be conducted as specify IAW TM 9-1055-647-13&P. The COSIS maintenance checks for the HIMARS Chassis will be conducted as specify in IAW TM 9-1055-1646-13&P (see Encls 1 & 2 for Chassis COSIS Checks).

c. The COSIS program for the Launcher Loader Modular for both HIMARS and MRLS M270A1 systems will be conducted by the Lockheed Martin Field Service Representative (FSR) every (6) six months. A lockable storage area will be require to store system spares and test equipment used by the FSR for cyclic maintenance. Limited equipment availability and high dollar value spares necessitate the need for a secure storage area. In addition, the FSR will require a work space with a desk and internet access (if available) in close proximity to the equipment for use with test equipment. In the event that the APS is provided guidance

that any MLRS or HIMARS weapon systems are to be drawn from that location. The APS will promptly notify PFRMS.

d. HIMARS Carrier/Chassis COSIS Checks:

(1) HIMARS Chassis checks to be made every 90 days

(a) Preform Walk around visual inspection looking for any unusual conditions. Note any findings e.g. leaks, flat tires, cosmetic or structural damage.

(b) Start engine and let run for approximately 30 minutes.

(c) Verify all gauges are functional and operational

(d) Check batteries and terminals for corrosion and tightness.

(e) Perform a walk around visual inspection checking for any fluid leaks.

(f) Check all fluid levels to include anti-freeze, engine oil, and transmission fluid.

(g) Check all batteries and terminals for corrosion and tightness.

(h) Check door seals, commanders hatch seal, latches and operation of latch hardware.

(i) Check condition of seats, seat belts, and seat belt latches.

(j) Verify Safety features:

1. Brakes- full pedal, spongy half pedal
2. Lights (all)
   (i) Safety Flashers
   (ii) Turn Signals
   (iii) Brake lights
   (iv) Side markers
   (v) Inside cab lights
3. Horn
4. Warning Alarms
5. Check windshields for delamination or cracks
6. Windshield wiper blades and washer fluid

(k) Start engine and let warm up for approximately 30 minutes:

1. Verify all gauges are functional and operational
2. Check batteries and charging system for correct voltage output.
3. Cycle the Central Tire Inflation System (CTIS) from highway to sand and back to highway.
4. Engage transmission and verify that vehicle moves freely with no brakes binding or dragging.

(l) Drive vehicle for at least 4 to 5 miles using full range of transmission gears:

1. Monitor gauges and note any unusual conditions during road exercise
2. Check operation of heater, defroster, and Air conditioner unit.
3. Check operation of steering-does vehicle drift or pull left or right?
4. Check transmission operation forward and reverse
5. Check brake operation while driving in forward and reverse
6. Park vehicle on flat surface, and engage parking brake.
7. Perform a walk around visual inspection checking for any fluid leaks.

(m) Cab Safe Pressure Test:

1. Close all cab doors and latches
2. Start vehicle
3. Turn on vehicles high idle switch
4. Verify pressure gauge is set to zero and all compartments and latches are closed.
5. Engage CAFU switch and verify that the green indicator light on front panel is illuminated.
6. While CAFU is operating open vehicle door to verify that CAFU ramps up as engine RPMS

increase.

e. MLRS M270A1 Carrier / Chassis COSIS Checks:

(1) MLRS Chassis checks to be made every 90 days:

(a) Perform walk around visual inspection looking for any unusual conditions. Note any findings e.g., leaks, cosmetic or structural damage.

(b) Check all fluid levels to include anti-freeze, engine oil, and transmission fluid.

(c) Check wire and lead seal on engine compartment fire extinguisher.

(d) Open engine access compartment:

1. Check Air Cleaner Indicator

2. Check operation of Century Fault Lamp system

(e) Check all batteries and terminals for corrosion and tightness.

(f) Check door seals, commanders hatch seal, latches and operation of latch hardware.

(g) Check cab ventilation system.

(h) Check condition of seats, seat belts, and seat belt latches.

(i) Verify safety features:

1. Brakes

2. Lights (all)

(i) Safety flashers

(ii) Turn signals

(iii) Brake lights

(iv) Side markers

(v) Inside cab lights

3. Horn

4. Warning Alarms

5. Check Windshields for cracks

6. Windshield wiper blades and washer fluid

(j) Start engine and let warm up for approximately 30 minutes.

1. Verify all gauges are functional and operational

2. Check condition of drive sprockets, tracks and track pads

3. Check batteries and charging system for correct voltage output

4. Engage transmission and verify that vehicle moves freely with no brake binding or dragging

(k) Drive vehicle for at least 4 to 5 miles using full range of transmission gears including pivot steering.

1. Monitor gauges and note any unusual conditions during road excise

2. Check operation of heater and defroster

3. Check operation of steering

4. Check operation of transmission forward and reverse

5. Check operation of brakes while driving

6. Park vehicle on flat surface and engage parking brake

7. Perform a walk around visual inspection checking for any fluid leaks

(l) Check Cab Hinge Studs and Cab Lift Mechanism

(m) Check suspension system.

(n) Check operation of all louvers.

(o) Check operation of Auxiliary Power Unit (APU).

(p) Check operation of Environmental Control Unit (ECU).

(q) Ensure Hull drain plugs are installed.

SECTION VII. OBJECTIVE GUNNER PROTECTION KIT (O-GPK) & COMMON REMOTELY OPERATED WEAPONS STATION (CROWS)

6.7 REQUIREMENTS

a. Equipment with OGPKs installed require inside storage. If outside storage is the only option, the site will use a protect cover to prevent water and or mold damage inside the vehicle. When protective covers are used, the site shall perform routine surveillance ensuring that the cover fasteners are secured property and in serviceable condition. Per FMTV, these trucks were equipped with the M1114 turret ring and weapons station interface ring (NSN: 2510-01-578- 4322). This facilitates the installation of OGPKs and CROWS. The FMTVs shall now be able to mount crew served weapons.

(1) There are no major concerns with the storage of mounts and OGPKs in an enclosed/covered area.

(2) When installed on a vehicle and stored, it is recommend that the OGPK be covered to avoid pooling of water/snow.

(3) Any fasteners that removed in the course of storage/re-installation must be discarded and replaced by new fasteners.

(4) The OGPK and the turret rings are very heavy. So appropriate lifting procedures apply.

CHAPTER 7
ISSUE FROM STORAGE (PHASE III)

SECTION I POLICY

7.1 POLICY

a. Before equipment is handed off to a using unit, all necessary PMCS will be performed in accordance with operator's requirements outlined in the equipment's operator, maintenance, or sustainment manual. Equipment will be handed off IAW AR 750-1, paragraph 3-2.

SECTION II. GENERAL

7.2 REQUIREMENTS

a. There are three possible reasons to issue/unload APS materiel and supplies: cyclic maintenance, contingency, and training exercises. It is essential that during cyclic maintenance all serviceability checks and services are performed prior to preservation and placement of equipment back in storage. If failures are detected and cannot be repaired, the equipment shall be replaced. The replacement must meet the established maintenance standards stated in the equipment’s maintenance manuals. During contingency hand-offs and training exercises crew level checks and selected unit level checks must be performed prior to the issue to the using units or in conjunction with the using units. The rationale for fully performing these checks is that some storage conditions limits the maintenance checks, exercising requirements, and other essential inspections that must be performed to determine equipment functionality.

b. For afloat equipment the on-board crew will de-preserve and activate the equipment, undertaking all crew level checks and selected unit level checks prior to the handover/issue to the using units or in conjunction with the using units. If an emergency occurs, the on-board lead man may request that a "supplemental Offload Preparation Party (OPP)" join them.

c. Land-based equipment hand-off will normally be accomplished by the personnel assigned to that site. AMC materiel fielding teams could provide additional or special assistance.

d. During hand-off the application of MWOs, servicing equipment, reassembly, BII inventory, testing, calibration, and major repairs (including dry docking) and special systems checks not accomplished while in storage must be accomplished.

e. For APS watercraft forward stored at WES-KNB, and WEB-YND, activation and hand-off of the vessels and ancillary equipment can be accomplished within 96 hours of troop arrival at the site, when performed in accordance with established activation procedures for each vessel, as published in each site’s appropriate Battle Book. For full activation, 10 days are required to prepare vessels before troop arrival. Smaller scale activations will require less prep time; e.g., 6 LCU 2000s require 3 days prep time, etc.

SECITON III PLANNING

7.3 PRIOR TO HAND-OFF

a. Planning requires written handoff procedures, which include the following:

(1) A location record for all equipment that can be issued and personnel thoroughly familiar with the locator system.

(2) A flow chart to route equipment to servicing, work, and staging areas within the minimum amount of time.

(3) Inspection and inventory checkpoints to ensure that planned actions are accomplished.

(4) MHE, tools, special equipment, and instrumentation for test and calibration.

(5) Fully charged and activated batteries. Class IX such as fan belts, tires, inner tubes, checked for serviceability.

(6) Trained personnel to assemble, test, and ensure operational readiness.

(7) Equipment, fuel supplies, and operators for fueling point.

(8) A staging area for assembling and releasing equipment.

(9) Joint inventory of materiel between losing and gaining organizations.

(10) Procedures for transfer of accountability. A series of scan points, depending on the hand-off

operations, will be established to track accountability.

NOTE

No AOAP sampling of equipment will be performed on APS-3 materiel during hand- off unless directed by the gaining commander.

b. Following the joint inventory, the designated representative from the gaining unit will sign an ISR produced hand receipt transferring accountability from the APS accountable record to the gaining unit's accountable record. Equipment not handed off to a unit will be maintained on APS accountable records.

c. APS representatives will provide data disks to the gaining unit commander in order to update their STAMIS boxes, currently GCSS-Army.

SECTION IV. ACTIVATION AND DE-PROCESSING

7.4 ISSUE PRECEDENTS

a. Equipment removed from non-CH storage or container vessels will, in most cases, require more de-processing time even though the preservation proceedings herein have been designed to require minimum de-processing time. Generally, the equipment can be placed in service by removal of barrier materials and tapes. In most cases, contact preservatives need not be removed. The major de-processing effort will be in activation and purging of preserved engines and fuel and gun systems.

(1) Vehicles may have preservative oil in the fuel system and engine combustion chambers. The presence of this oil sometimes makes starting difficult. Preserved gasoline-fired engines can be started more easily and quickly if a supply of fresh fuel is connected directly to the fuel inlet side of the carburetor. If crankcase contains preservative oil, MIL-PRF- 21260, of the proper type and grade, the oil need not be drained.

(2) Weapon systems will be de-processed by the removal of preservation materials from the breech and muzzle ends and the VCI tube from the barrel. The barrel may be cleaned by light swabbing, if desired.

(3) MIL-C-10382 preservative compound applied to potable water tanker's internal tanks, piping, and/or faucets will be removed by flushing with hot water (160 degrees F.) or with steam before filling with potable water.

NOTE

Do not retain these materials for reuse

(4) Vehicles requiring replacement batteries or stored without batteries will have batteries installed.

CAUTION

Improperly connected batteries can damage vehicle electrical systems. Reversed polarity (positive to negative) can damage alternator.

(5) Dismount installed air-spring brake chamber storage brackets to prevent brake failure, where appropriate. Any time a vehicle is removed from storage, the brakes will be tested by stopping the vehicle, traveling at 15 mph maximum, five times. During this test, visually examine exterior of brake for evidence of leaking fluid.

(6) Fill fuel tanks with proper grade and type of fuel. Take special precautions during fueling to avoid spills and ensure tires exposed to fuel are immediately cleaned.

(7) Check all refrigeration systems to ensure systems are fully charged in accordance with the applicable technical manuals.

(8) Removal of preservative compounds is not required before issue of petroleum tank vehicles. Replacement filters will be provided to draw units in addition to new filters currently installed. The separator vessel will be stenciled with the month and year put into service.

b. Components previously disassembled/removed must be collected and reinstalled. Generally, the end item shall be activated before components are reinstalled. This permits the availability of on-board power for checkouts.

c. Issued equipment is subject to the tests and inspection specified in their applicable TMs. Of particular concern are the following:

(1) TOW missile systems. The TOW subsystem verification (M2A2ODS) will be performed prior to hand-off to the war fighter. See TM 9-1425-453-34-1 and TM 9-1425-453-34-2.

(2) M139 mine dispenser. See TM 9-1095-208-10-1.

(3) Night Vision Driver's Viewer, AN/VVS-2. The AN/VVS-2 must be tested and calibrated in a dark location prior to handoff per the procedure listed in TM 11-5855-299-12&P, Operator's and Unit Maintenance Manual for the Test Set, Electronics Systems, TS-4348/UV. The operator shall be familiar with the general operating procedures of the TS- 4348/UV contained in TM 11-5855-249-10, Operator's Manual Viewers, Driver's Night Vision, before performing calibration.

(4) Following activation and hand-off of watercraft, the services of a fully sanctioned U.S. Coast Guard company will be required to swing the compass of vessels prior to them leaving port.

(5) PATRIOT Missile System. The PATRIOT Radar will have a complete receiver and transmitter alignment to include TVM Uplink and transmitter synchronizer adjustments. See Appendix I of this manual.

d. For contingency off- loads and training exercises, medical equipment will be subject to the following:

(1) Seasoning of X-ray tubes. Seasoning of X-ray tubes prior to putting them in operation is mandatory if they have been in storage for periods greater than 180 days. Seasoning is required because, over time, metallic ions previously held by a getter inside the tube may become conductive pathways during an initial exposure and arc, destroying the X-ray tube after a few exposures. The recommended procedure follows:

(a) Set the X-ray tube current (mA) at the lowest or continuous fluoroscopic exposure (generally the leakage technique factor) and lowest kVp value selection.

(b) Make an initial series of timed exposures at ½ the maximum advertised kVp rating of the system; e.g., 65 kVp for a system rated at 130 kVp maximum. Allow sufficient operation time at each kVp selection to equal about ½ the maximum heat lead of the X-ray tube (mA x kVp = HU). Gradually raise the kVp in 5 kVp to 10 kVp increments until maximum rated kVp is reached. As maximum or rated kVp is approached, more time shall be spent at each kVp selection with additional cool down time between exposures. More exposure time shall be spent between 90 percent and 100 percent rated voltage than is spent between 60 percent and 90 percent rated voltage. This will gradually raise the HU values inputted into the X-ray tube, and may cause the tube housing to become warm to the touch.

(c) The longer the period that a tube has been idle, the longer the seasoning period. Tubes in storage for longer than 6 months will benefit from seasoning periods of 1/2 hour or longer.

(d) shall any instability in tube current (mA) appear during the seasoning process, STOP and reduce the kV selection until the instability disappears. If the lower kVp selection allows operation, continue the seasoning and heat loading to about 50% of the maximum rating. Allow for cool down after the exposure and then gradually raise the kVp to continue the process.

(e) Do not attempt to continue the seasoning process of any tube unit if the initial instability or "arcing" reoccurs at the same kVp level. Arcing inside the tube unit is usually audible as "cracking," "spitting," or "hissing" sound become louder and more frequent as the kVp is increased.

(2) Additional sterilizer parts. Due to long-term storage, several parts of the Sterilizer Surgical Field, NSN 6530-00- 926-2151, could fail to operate when first tested. The parts that are known to fail will be added to the initial fielding kit for the sterilizer. The kits and the spare parts are located with the medical maintenance set.

(3) Biomedical equipment specialists. At the time of issue, biomedical equipment specialists, MOS 68A, will be responsible for unpacking, testing, and calibrating medical equipment prior to use. The brigade, hospitals, and minimal care detachments must ensure that this MOS is attached and deployed with the equipment.

(4) For APS-3 "Push packages." Those component items with special storage and handling codes, which were excluded from the packed portion of the assemblage to maintain security, prevent deterioration, and avoid such damage to packed components as corrosive leaks, and items with a SL, will be sent as a "push package." All other APS sites shall maintain components on site.

(5) Battery powered equipment.

(a) Batteries used in medical equipment shall be tested and/or recharged as soon as possible to include batteries in medical equipment usable on line voltage (115 volts nominal) or batteries.

(b) Batteries in medical equipment shall be fully charged upon completion of training exercises.

e. Cyclic maintenance serviceability inspections and performance testing of medical equipment will be performed in accordance with applicable TMs or manufacturer's literature prior to reconstitution of the medial assemblages by medical equipment repairers. In addition, the following will be accomplished prior to

reconstitution.

(1) All medical equipment will be inspected, tested, and serviced. Applicable preventive maintenance, calibration verification, and electrical safety services will be performed to ensure medical equipment is IAW AR 750-1, paragraph 3-2 prior to being placed in storage.

(2) All X-ray equipment will be inspected for signs of visible damage. X-ray equipment will be energized to determine condition and operational usability.

(3) All electrically or battery powered medical diagnostic or treatment equipment will be operationally tested. Upon completion of determining equipment is fully mission-capable, batteries will be disconnected. Operator replaceable, commercial off the shelf (AA, A, C, D, 9 volt) batteries will be removed from equipment.

(4) Medical equipment requiring the use of water during testing (for example, field sterilizer and field surgical sinks) will be operationally tested. Ensure a capability to purge 100 percent of the residual water is available. Add a small quantity of environmentally safe anti-freeze after purging the system.

(5) Medical equipment containing critical rubber components will have 100 percent of the items inspected for cracking, flaking, and blooming.

(6) Any defective medical equipment will be repaired on site or replaced.

CHAPTER 8
RECORDS AND REPORTING

SECTION I GENERAL

8.1 REQUIREMENTS AND RECOMMENDATIONS

a. The requirement for records of many types has been specified throughout this manual. For the purpose of emphasis, record requirements are reiterated in this chapter. In a few cases, this manual specifies dual use of forms. In those instances where no existing form is available, local development of a form or worksheet is recommended.

b. APS projects are subject to many record and reporting requirements pertaining to inventory status, financial reporting, QA, and so forth. Therefore, all locations storing and maintaining APS projects shall maintain a logbook to be stored with each major item or assembly where applicable. A central COSIS and maintenance file will be maintained by each site that will contain completed DA 2404 inspection form(s) from all inspections and actions taken during inspections and maintenance actions undertaken on each major item or assembly. The COSIS file will also contain a packing list, current and projected COSIS schedules, material and person-hours required, and all other documentation that would provide an inspecting official with a clear understanding of the COSIS and maintenance history for each end item or assembly. Nothing in this manual alters or waives regulatory reporting requirements.

c. Actions and procedures required to conform to regulatory equipment records will be planned based on what is most efficient for the available resources and what system will provide the greatest assurance of accurate, timely entry of required data.

d. It is recommended that each site or vessel have a weatherproof room where equipment records can be maintained in an orderly and secure manner. As equipment is inspected, tested, exercised, or calibrated, resulting data can be channeled to personnel responsible for maintenance of equipment records. This will ensure that personnel making the entries are those familiar with what is required and how it is to be entered.

e. A central location is recommended for storing TMs required as part of the equipment records. This permits a degree of flexibility not possible when stored on or in each piece of equipment. Normally, the only publications stored with equipment are those required as a part of the logbook, and the operator's manual that is a part of the BII. All other publications will be brought with the deploying units' to-accompany-troops (TAT) materiel.

f. Records and reporting requirements for controlled, sensitive, CCI, ammunition and munitions will be performed according to the applicable regulations and in accordance with a scheduled maintenance cycle and/or surveillance inspection plan.

SECTION II DA PA, 750-8
THE ARMY MAINTENANCE MANAGEMENT SYSTEM (TAMMS)

8.2 REPORTING REQUIREMENTS

a. Maintenance reporting equipment will be according to DA Pam 750-8, AR 700-138, and as directed by ASC.

b. Requests for waivers or deviations from the requirements of Materiel Condition Status Reporting (AR 700-138, Chapters 2, 3, or 4) and requests for additions to or deletions from the equipment reportable items list will be submitted to Commander, USAMC Logistics Data Analysis Center, ATTN: AMXLS-RRS, Redstone Arsenal, AL 35898. ASC, PSCC will forward requests through HQ ASC, to Commander, AMC, ATTN: AMCLG-RS, to HQ DA. Functional staff proponents within ODCSLOG (DALO-SMR, DALO-AV, and DALO-SMM) will be responsible for the final decision. Request may be made by any service member or Department of the Army civilian employee through their MACOM to ASC, PSCC for final decision by HQ DA.

SECTION III HUMIDITY CONTROL
RECORDER CHARTS

8.3 USE AND RETENTION

a. Calibration and ecorder charts are necessary for quality control, surveillance, and equipment maintenance. Surveillance of hygrothermographs is required in accordance with manufacture’s specifications. When the CH is functioning properly and within the prescribed limits of RH, no action is required. However, corrective action must be taken immediately, as indicated by fluctuating RH levels (i.e., notification of facilities engineers or the locally based engineer contractors).

b. RH charts will be maintained for three years by the responsible facility engineer project inspection personnel.

SECTION IV. READINESS REPORTING

8.4 READINESS REPORTING

a. HQ AMC will report readiness on a monthly basis for APS in accordance with AR 220-1 utilizing input from subordinate activities and USAMMA.

b. Special reports are required whenever a significant change occurs due to extraordinary circumstances, such as windstorm, hurricane, tornado, or other critical incident. The report will be prepared as a partial report to show the changed condition.

c. HQ DA-SMR is the approval authority for all excused reporting requirements; e.g., training

APPENDIX A
GENERAL REFERENCES

A-A-1051
Paperboard, Wrapping and Cushioning

A-A-3174
Plastic Sheet, Polyolefin

A-A-1451
Twine, Fibrous

A-A-1898
Cushioning Material, Cellulosic, Packaging

A-A-1936
Adhesive, Contact, Neoprene Rubber

A-A-50177
Paper, Lens

A-A-50185
Cloth, Batiste, Cotton, Polishing

A-A-52408
Preservative Coating, Rubber: for Rubber Surfaces

A-A-52557
Fuel Oil, Diesel; for Posts, Camps and Stations

A-A-52465
Primer Coating, Synthetic, VOC Compliant (for Brake Drums)

A-A-52624
Antifreeze, Multi-Engine Type

A-A-59133
Cleaning Compound, High Pressure (Steam) Cleaner

A-A-59303
Talc, Technical

AR 40-61
Medical Logistics Policies and Procedures

AR 190-11
Physical Security of Arms, Ammunition, and Explosives

AR 190-13
Army Physical Security Program

AR 190-51
Security of Unclassified Army Property (Sensitive and Non-Sensitive)

A-1AR 220-1
Unit Status Reporting

AR 380-5
Department of the Army Information Security Program

AR 385-10
The Army Safety Program

AR 700-37
Packaging of Army Materiel

AR 700-48
Management of Equipment Contaminated with Depleted Uranium or Radioactive Commodities

AR 700-68
Storage and Handling of Compressed Gases and Gas Liquids in Cylinders

AR 700-138
Army Logistics Readiness and Sustainability

AR 702-6
Ammunition Stockpile Reliability Program (ASRP)

Army Regulation 702-11
Army Quality Program, dated 2 March 2007

AR 702-18
Materiel Quality Control Storage Standards

AR 710-1
Centralized Inventory Management of the Army Supply System

AR 710-2
Inventory Management Supply Policy Below the Wholesale Level

AR 710-3
Asset and Transaction Reporting System

AR 740-1
Storage and Supply Activity Operations

AR 740-26
Physical Inventory Control

AR 750-1
Army Materiel Maintenance Policy

AR 750-43
Army Test, Measurement and Diagnostic Equipment (TMDE) Program

ASQ Z1.4.
Sampling Procedures and Tables for Inspection by Attributes - T004E

ASTM-D928
Sodium Bicarbonate, Specification for

ASTM-D1974/D1974M
Standard Practice for Methods of Closing, Sealing, and Reinforcing Fiberboard Shipping Containers

ASTM-D3951
Standard Practice for Commercial Packaging

ASTM-D3953
Strapping, Flat Steel, and Seals

ASTM-D4057
Standard Practice for Manual Sampling of Petroleum and Petroleum Products

ASTM-D4176
Free Water and Particulate Contamination in Distillate Fuels (Visual Inspection Procedures)

ASTM-D4860
Free Water and Particulate Contamination in Mid-Distillate Fuels (Clear and Bright Numeric Rating)

ASTM-D5118
Standard Practice for Fabrication of Fiberboard Shipping Boxes

ASTM-D5168, CLASS CGWR
Practice for Fabrication and Closure of Triple-Wall Corrugated Fiberboard Containers

ASTM-D5486
Tape, Pressure Sensitive, Packaging for Box Closure and Sealing

ASTM-D5749
Specification for Reinforced and Plain Paper Gummed Tape for Sealing and Securing

ASTM-D6039/ D6039 M
Crates, Wood, Open and Covered

ASTM- D6251 / D6251M
Standard Specification for Wood-Cleated Panelboard Shipping Boxes.

ASTMD7478/D7478M
Crates, Wood: Lumber and Plywood Sheathed, Nailed, and Bolted

ASTM-F1267
Standard Specification for Metal, Expanded, Steel

DD Form 2927
Petroleum and Lubricants Sample Identification Tags

DA Form 2028
Recommended Changes to Publications and Blank Forms

DA Form 2404
Equipment Inspection and Maintenance Worksheet

DA Form 2407
Maintenance Request

DA Form 2408-4
Weapon Record Data

DA Form 2408-20
Oil Analysis Log

DA Form 3256
Preservation and De-preservation Guide for Marine Equipment

DA Form 7281

Command Oriented Arms, Ammunition, and Explosives (AA&E) Security Screening and Evaluation Record

DA PAM 385-24,
Army Radiation Safety Program

DA PAM 385-64
Ammunition and Explosives Safety Standards

DA PAM 700-48
Handling Procedures for Equipment Contaminated with Depleted Uranium or Radioactive Commodities

DA PAM 710-2-1
Using Unit Supply System (Manual Procedures)

DA PAM 742-1
Ammunitions Surveillance Procedures

DA PAM 750-8
User's Manual for the Army Maintenance Management System (TAMMS)

DLM 4000.25
Defense Logistics Management System (DLMS)

DLM 4000.25 Volume 2,
Supply, Chapter 17 - Supply Discrepancy Reporting

DoDM 4000.25-2
Military Standard Transaction Reporting and Accounting Procedures

DoDM 4140.27, Volume I
DoD Shelf-Life Management Program: Program Administration

DoDM 4140.27, Volume II
DoD Shelf-Life Management Program: Program Administration

DoDM 4140.65
Issue, Use, and Disposal of Wood Packaging Material (WPM)

DoDM 5100.76
Physical Security of Sensitive Conventional Arms, Ammunition, and Explosives

DTR 4500.9 Part II, Appendix K
Active Radio Frequency Identification (RFID) In-Transit Visibility (ITV) Data Requirements DTR 4500.9-R, Part II (cargo Movement).

ATP 3-35
Army Deployment and Redeployment

ATP 3-35.1
Army Prepositioned Operations

Global Combat Support System- Army
GCSS-A

TM 38-701
Packing of Materiel - Packing

INTERNATIONAL STANDARDS FOR PHYTOSANITARY MEASURES ISPM 15
Regulation of Wood Packaging Material in International Trade

MIL-PRF-81309
Corrosion Preventive Compounds, Water Displacing, Ultra-Thin Film

MIL-D-3464
Desiccants, Activated, Bagged, Packaging Use and Static Dehumidification

MIL-D-3716
Desiccants, Activated for Dynamic Dehumidification

MIL-DTL-117
Bags, Sleeves and Tubing

MIL-DTL-53072
Chemical Agent Resistant Coating (CARC) System Application Procedures and Quality Control Inspection

MIL-HDBK-138
Container Inspection Handbook for Commercial and Military Intermodal Containers MIL-I-22110

MIL-I-22110
Inhibitor, Corrosion, Volatile, Crystalline Powder

MIL-PRF-121
Barrier Material, Greaseproof, Waterproof, Flexible

MIL-PRF-131
Barrier Materials, Watervaporproof, Greaseproof, Flexible, Heat-Sealable

MIL-PRF-372
Cleaning Compound, Solvent (for Bore of Small Arms and Automatic Aircraft Weapons)

MIL-PRF-680
Degreasing Solvent

MIL-PRF-2104
Lubricating Oil, Internal Combustion Engine, Combat/Tactical Service

MIL-PRF-3150
Lubricating Oil, Preservative, Medium

MIL-PRF-6081
Lubricating Oil, Jet Engine

MIL-PRF-6799
Coatings, Sprayable, Strippable, Protective, Water Emulsion

MIL-PRF-10924
Grease, Automotive and Artillery

MIL-PRF-16173
Corrosion Preventive Compound, Solvent Cutback, Cold-Application

MIL-PRF-18458
Grease, Wire Rope and Exposed Gear

MIL- PRF-21260
Lubricating Oil, Internal Combustion Engine, Preservative and Break-in

MIL-PRF-22750
Coating, Epoxy, High Solids

MIL-PRF-23377
Primer Coating: Epoxy, High-Solids

MIL-PRF-23699
Lubricating Oil, Aircraft Turbine Engine, Synthetic Base, NATO Code Number 0-156

MIL-PRF-32033
Lubricating Oil, General Purpose, Preservative (Water-Displacing, Low Temperature)

MIL-PRF-44156
Kitchen, Company Level, Field Feeding (KCLFF), Components Thereof

MIL-PRF-46010
Lubricant, Solid Film, Heat Cured Corrosion Inhibiting

MIL-PRF-46146
Adhesives-Sealants, Silicone, RTV, Noncorrosive (for use with Sensitive Metals and Equipment)

MIL-PRF-46147
Lubricant, Solid Film, Air Cured (Corrosion Inhibiting)

MIL-PRF-46167
Lubricating Oil, Internal Combustion Engine, Arctic

MIL-PRF-46176
Brake Fluid, Silicone, Automotive, All Weather, Operational and Preservative

MIL-PRF-63460
Lubricant, Cleaner and Preservative for Weapons and Weapons Systems (Metric)

MIL-PRF-83282
Hydraulic Fluid, Fire Resistant, Synthetic Hydrocarbon Base, Metric, NATO Code Number H-537

MIL-PRF-85582
Primer Coatings: Epoxy, Waterborne

MIL-STD-147
Palletized Unit Loads

MIL-STD-2073-1
Standard Practice for Military Packaging

MIL-STD-3003B
Vehicles, Wheeled: Preparation for shipment and storage of; 24 SEP 2007

MIL-STD-3004
Quality Surveillance for Fuels, Lubricants, and Related Products

MMM-A-260
Adhesive, Water-Resistant, (for Sealing Waterproofed Paper)

NAS833
Plug-Protective, Flared Hose or Tube Assembly

NAS836.
Plug-Protective, Flared Tube, Hose Assembly or MS33649 Boss

O-B-41
Battery Water

SB 11-6
Communications-Electronics Batteries Supply And Management Data

SB 740-94-1- Storage Serviceability Standards for SBCCOM
Material Sets, Kits, Detectors and Alarms, CBR and Ancillary Items

SB 740-94-2- Storage Serviceability Standards for SBCCOM Material
Decontaminating Equipment and Decontaminating Agents

SB 740-94-5- Storage Serviceability Standards for SBCCOM Material
Mask, Chemical-Biological (All Types), and Ancillary Equipment

SB 740-94-6- Storage Serviceability Standards for SBCCOM Material
Filter Units, Gas Particulate and Ancillary Items

SB 740-94-8- Storage Serviceability Standards for SBCCOM Material
Riot Control Agent Dispersers and Ancillary items

SB 740-94-9-
Storage Serviceability Standards for SBCCOM Material Smoke Generators and Ancillary items

TB 9-1000-234-13
Exercising of Recoil Mechanisms and Equilibrators

TB 9-1300-278

Guidelines for Safe Response to Handling, Storage, and Transportation Accidents Involving Army Tank Munitions or Armor Which Contain Depleted Uranium

TB 9-6140-252-13
Recharging Procedures for Automotive Valve Regulated

TB 9-1300-278
Guidelines for Safe Response to Handling, Storage, and Transportation Accidents Involving Army Tank Munitions or Armor Which Contain Depleted Uranium

TB 9-6140-252-13
Recharging Procedures for Automotive Valve Regulated.

TB 43-0116
Identification of Radioactive Items in the Army

TB 43-0134
Battery Disposition and Disposal

TB 43-0135
Environmentally Safe Substances for Use with Communications-Electronics Equipment

TB 43-0137
Transportation Information for US Army Radioactive Commodities

TB 43-180
Calibration and Repair Requirements for the Maintenance of Army Materiel

TB 43-0142
Safety Inspection and Testing of Lifting Devices

TB 43-0144
Painting of Watercraft

TB 43-0197
Instruction for Safe Handling, Maintenance, Storage, and Disposal of Radioactive Items Licensed by US Army Armament and Chemical Acquisition and Logistics Activity

TB 43-0213
Corrosion Prevention and Control Including Rust proofing Procedures for Tactical Vehicles and Trailers

TB 43-0216
Safety and Hazard Warnings for Operation and Maintenance of TACOM Equipment

TB 43-0242
CARC Spot Painting

TB 750-25
Maintenance of Supplies and Equipment: Army Test, Measurement and Diagnostic Equipment (TMDE) Calibration and Repair Support (C&RS) Program

TB 750-651
Use of Antifreeze Solutions, Antifreeze Extender, Cleaning Compounds, and Test Kit in Engine Cooling Systems

TM 1-1730-229-13
Operator and Field Maintenance Manual for Power Unit, Aviation, Multi-Output GTED Electrical, Hydraulic, Pneumatic (AGPU) Wheel Mounted, Self-Propelled, Towable AC 400HZ, 3PH, 0.8 PF, 115/200V, DC 28 Volt, Pneumatic 60 LBS/Min at 40 PSIG, Hydraulic 15.2 GPM at 3300 PSIG

TM 4-43.31
Petroleum Laboratory Testing and Operations

TM 5-6635-350-13&P
Operator and Field Maintenance Manual (Including Repair Parts and Special Tools List) for Density Moisture Tester NSN: 6635-01-60401875

TM 9-1005-201-23&P

Unit and Direct Support Maintenance Manual (Including Repair Parts and Special Tools Lists) for Machine Gun, 5.56MM, M249 with Equipment NSN: 1005-01-127-7510 (EIC: 4BG)

TM 9-1095-208-10-1

Operator's Manual for Dispenser, Mine: M139 (NSN 1095-01-235-3139) (EIC: 3V8) with mounting Kits for 5-ton Vehicle (NSN 1095-01-252-2818) (EIC: 3V9) and M548A1 Vehicle (NSN 1095-01-331-6755) (Ground Volcano)

TM 9-1425-453-34-1

Intermediate Direct Support and Intermediate General Support Maintenance Manual for Bradley Fighting Vehicle TOW 2 Subsystem Consisting of: Missile Guidance Set (NSN 1420-01-329-8870), Launcher Assembly (NSN 1440-01-178-1141), Launcher Assembly (NSN 1440-01-167-7514), and Integrated Sight Unit (NSN 1240-01-216-6331)

TM 9-1425-453-34-2

Direct Support and General Support Maintenance Manual for Bradley Fighting Vehicle TOW 2 Subsystem Consisting of: Missile Guidance Set (1420-01-329-8870), Launcher Assembly (NSN 1440-01-178-1141), Launcher Assembly (NSN 1440- 01-167-7514), and Integrated Sight Unit (NSN 1240-01-216-6331)

TM 9-2330-339-13

Operator's, Unit, Direct Support, And General Support Maintenance Manual For Semitrailer, Tank: 5000 Gallon, Bulk Haul, Self-Load/Unload M967 (NSN 2330-01-050-5632) M967A1(2330-01-155-0046) Semitrailer, Tank: 5000 Gallon, Fuel Dispensing, Automotive M969 (2330-01-050-5634) M969A1 (2330-01-155-0048) Semitrailer, Tank: 5000 Gallon, Fuel Dispensing, Under/Over wing Aircraft M970 (2330-01-050-5635) M970A1 (2330-01-155-0047)

TM 9-2350-264-23-1/2, TM 9-2350-264-24-1/2, TM 9-2350-264-24P-1-1/1-2

Unit Maintenance Manuals, for Tank, Combat, Full-Tracked: 120-MM Gun, M1A1 (NSN 2350-01-087-1095) General Abrams

TM 9-2530-200-24

Unit, Direct Support and General Support Maintenance Manual Standards for Inspection and Classification of Tracks, Track Components and Solid-Rubber Tires (FSC 2530)

TM 9-2355-101-10

Operator Manual for Medium Mine Protected Vehicle, NSN 2355-20-001-9926 RG 31000 (EIC: 1ZB), NSN 2355-20-001- 9922 RG 31001 (EIC: 1ZC), NSN 2355-20-001-9932 RG 31003 (EIC: 1ZD), 31 August 2007

TM 9-2355-315-10

Marine Corps TM 11202C-OR Rev B, Operator Manual Commercial Off-The-Shelf (COTS) for Mine Resistant Ambush Protected (MRAP) Vehicle, Category I, RG31A2 (NSN 2355-01-552-5169), RG31A2M1 (NSN 2355-01-568-7688), RG31A2RTR (NSN 2355-01-572- 7980), 30 September 2009.

TM 9-2355-335-10

Operator Manual Commercial-Off-The-Shelf (COTS) for Mine Resistant Ambush Protected All Terrain Vehicle (M-ATV) M1240, NSN: 2355-01-575-9632, 2 October 2009.

TM 9-2355-441-10

Operator Manual for MaxxPro TM Dash Mine Resistant Ambush Protected (MRAP) Vehicle, Category I, 2355-01-620- 2131/2355-01-620-2132, 5 September 2014

YM 9-2355-444-10
Operator Manual for MaxxPro TM Dash Long Wheel Base Ambulance Mine Resistant Ambush Protected (MRAP) Vehicle, Category I, 2355-01-620-0199, 30 January 2015

TM 9-6140-200-13
Operator and Field Maintenance for Automotive Lead-Acid Storage Batteries

TM 9-2610-200-14
Operator's Unit, Direct Support, and General Support Maintenance Manual for Care, Maintenance, Repair, and Inspection of Pneumatic Tires and Inner Tubes

TM 11-5855-249-10
Operator’s Manual for Viewers, Driver’s, Night Vision, AN/VVS-2 (NSN 5855-00-629-5278), AN/VVS-2(V)1A (5855-01-096-08), AN/VVS-2(V)2 (5855-01-057-1880, AN/VVS-2((5855-01-096-0872), AN/VVS-2(V)3 (5855-01-105-7793, AN/VVS-2(V)4 (5855-01-235-5489)
TM 11-6140-203-14-1
Operator's, Organizational, Direct Support, and General
Support Maintenance Manual for Aircraft and Non-aircraft Nickel-Cadmium Batteries (General)

TM 38-400
Joint Service Manual for Storage and Materials Handling

TM 38-8145-709
Care of Supplies in Storage (COSIS) for Army Material

TM 43-0139
Painting Instructions for Army Materiel

APPENDIX B
SPECIFICATIONS AND NATIONAL STOCK NUMBER

Table B-1. Specifications and National Stock Numbers for Packaging Materials

SPECIFICATION	TITLE	NSN	ITEM DESCRIPTION
A-A-1051	Brushes, Acid, Swabbing	7920-00-543-7728 7920-00-5 14-2417	8-25 inch long; 1GR =144 each 5.75 inch lonQ;1GR=144 each
A-A- 1451	Twine, Fibrous	4020-00-233-5990 4020-00-231-5860	1,500 foot long Ball;12 ply 4,500 foot long Cone;8 ply
A-A- 1898	Cushioning Materials, Cellulosic, Packaging	8135-00-989-9889 8135-00-849-7847	200 foot x 24 inch x *V.* Inch Roll 100 foot x 36 inch x 1inch Roll
A-A- 1936	Adhesive, Contact Neoprene Rubber	8040-00-779-9595 8040-00-058-2399 8040-00-754-2685	1 pint can 1quart can 1gallon can
A-A-3 174	Plastic Sheet, Polyolefin	8135-00-584-0610 8135-00-618- 1783	100 foot x 96inchx 0.004 inch 100 foot x 192inch x 0.006inch
A-A-50 177	Paper Lens	6640-00-559- 1385	11inch x 7inch·1 HD = 100 each
A-A-50185	Cloth, Batiste, Cotton, Polishing	8305-01-152-3587	45 inches wide; order by yard of length
A-A-52408	Preservative Coating, Rubber. For Rubber Surfaces	8030-01-314-2213 8030-01-282-5626 8030-01-314-2214	1quart can 1gallon can 5gallon can
A-A-52465	Primer Coating, Synthetic, VOC Compliant (for Brake Drums)	8010-01-359-9245	1gallon can
A-A-52624	Antifreeze, Multiengine Type	6850-01-464-9263 6850-01-464-9137 6850-01-464-9096 6850-01-464-9152	5-galloncontainer;pre-diluted (60%) 5-galloncontainer; concentrated(100%) 55-gallon drum; pre-diluted (60%) 55-gallon mm; concentrated (100%)

Table B-1. Specifications and National Stock Numbers for Packaging Materials (Continued)

SPECIFICATION	TITLE	NSN	ITEM DESCRIPTION
A-A-59133	Cleaning Compound, High Pressure (Steam)Cleaner	6850-00-965-2087 6850-00-965-2330	25 pound drum 150pounddrum
A-A-59282	Ethyl Alcohol, Absolute	6810-00-127-4532	1gallon;99.5% ethyl alcohol
ASTM D3953 ASTMD5486, Type 4	Strapping, Flat Steel, and Seals Tape, Pressure Sensitive , Packaging for Box Closure and Sealing	8135-00-283-0669 8135-00-239-5293 Local Purchase Local Purchase Local Purchase	approx. 1,700 foot x o/4 inch strapping 2,000 each¥. inch seals per box 60 yards x 3inch roll 60 yards x 2inch roll 60 yards x 1inch roll
MIL-PRF- 83282	Hydraulic Fluid, Fire Resistant, Synthetic Hydrocarbon Base, Aircraft Metric, NATO Code Number H-537	9150-00-149-7431 9150-00-149-7432 9150-01-009-7709 9150-00-180-6290	1 quart can 1 gallon can 10 gallon drum 55 gallon drum
MMM-A-260	Adhesive, Water- Resistant, (for Sealing Waterproofed Paper)	8040-00-273-8703 8040-00-273-8704	4 each - 1 gallon cans 5 gallon can
O-B-41	Battery Water	6810-00-286-3783 6810-00-297-9540	4 each - 1 gallon bottles 5 gallon drum
SAE J2360	Lubricating Oil, Gear Multipurpose (80w-90Grade)	9150-01-035-5392 9150-01-313-2191 9150-01-035-5393 9150-01-035-5394	1 quart can 1 gallon can 5 gallon can 55 gallon drum
	Soap, Saddle (Leather Goods)	7930-00-170-5467	1 pound can

APPENDIX C
PETROLEUM SAMPLING PROCEDURES AND EQUIPMENT

C.1 GENERAL

a. Required sampling devices for each method shall be constructed using equipment identified in this appendix.

b. All sample containers must be absolutely clean and free of water, dirt, lint, washing compounds, naphtha, or other solvents, soldering fluxes or acids, corrosion, rust, or oil. New sample containers meeting all of the above criteria are not required to be cleaned. If a previously used sample container is utilized, the following cleaning procedures must be completed prior to using the container. Rinse container with Stoddard solvent or naphtha. Then wash the container with strong soap solution, rinse it thoroughly with tap water, and finally with distilled water. Dry either by passing a current of clean, warm air through the container or by placing it in a dust free cabinet at 104 degrees F (40 C) or higher.

c. Minimum sample size for liquid fuels taken from rolling stock is one gallon. Only UN/1A1 approved containers shall be used such as the type identified in Appendix C.

d. Refer to Appendix D, Table D-2 for minimum sample size requirements for packaged products.

e. DD Form 2927 (Petroleum and Lubricants Sample Identification Tags) shall be completed and attached to the sample container immediately after taking each sample. Package products, which require more than one container to make up one sample, shall all be tagged; however, all containers required to make up one sample shall be given the same sample number.

f. Equipment that has been sampled and subsequently resulted in a test failure shall be excluded from future sampling unless corrective action has been taken to bring the fuel in the specific piece of equipment to an on-grade condition.

g. Personnel involved with sampling of petroleum and petroleum-related products shall be familiar with their physical and chemical characteristics, including: potential for fire, explosion, and reactivity; toxicity and health hazards; and appropriate emergency procedures. The appropriate Safety Data Sheet (SDS), API, or ASTM International publication shall be consulted. Personnel shall comply with AR 385-10 and Federal safety regulations, including the use of personal protective equipment (PPE). Upon completion of any sampling activity, ensure the sample point is left in a safe, secure, and clean condition with the handling of any waste in accordance with local requirements. Refer to ASTM-D4057 for more information.

C.2 APIGRAVITY SCREENING PROCEDURES

a. The purpose of API screening is to ensure equipment intended to be loaded aboard APS-3 vessels contains JP8, or an adequate JP8/DF mixture to prevent microbial growth, and provide good cold temperature operability. Equipment tested for API Gravity with a reading 37.0 degrees API or above, in compliance with MIL-DTL-83133, will initially be considered as JP8, or having an adequate JP8/DF mixture to warrant sampling and laboratory testing. Equipment having an API Gravity less than 37.0 degrees API will be considered as not adequate for prepositioning until at least 1/2 of the volume of fuel is removed and replaced with JP8. API gravity screening shall be performed prior to laboratory sampling on all pieces of equipment except M1 tanks. Ml tank API screening shall be performed after the laboratory sample is taken.

b. API Gravity Screening is conducted by lowering a hydrometer into a hydrometer cylinder that has been filled with liquid fuel from 75 percent-85 percent full, and then reading the scale on the hydrometer.

(1) Inspect the thermo hydrometer to ensure none of the round beads at the bottom are loose. Also, check the thermometer to ensure there is no separation in the mercury column. Discard any thermo hydrometer failing the inspection.

(2) Clean the sampling device as indicated in the sampling procedures.

(3) Pump or pour fuel directly from the equipment into the hydrometer cylinder until it is approximately 75 percent -85 percent full. Position the hydrometer cylinder on a flat surface once filled. Remove any air bubbles on the top of the liquid surface by gently taping the palm of the hand on the top of the cylinder. Air bubbles on the liquid surface may also be removed by dabbing them with a paper towel.

(4) Lower the hydrometer gently into the liquid until it reaches a point where it will float all by itself. Using the stem, spin the hydrometer. Note: Spinning the hydrometer will help to center it in the liquid and will help prevent it from sticking to the side of the hydrometer cylinder.

(5) Position the eye slightly below the surface of the fuel and read the API where the fuel cuts across the scale divisions on the stem of the hydrometer. While leaving the thermo hydrometer in the fuel, read the temperature inside the body of the hydrometer.

(6) Using Table D-1, match the temperature observed on the hydrometer and determine the correction factor. Add or subtract the correction factor from the observed API on the hydrometer to arrive at the corrected reading. A reading equal to or greater than 37 degrees API will initially be considered as JP8, or having an adequate JP8/DF mixture to warrant sampling and laboratory testing.

C.3 LIQUID FUEL SAMPLING PROCEDURES

a. All-levels sample will be taken by submerging a stoppered beaker (copper weighted beaker) to the bottom of a storage tank, or bulk fuel compartment of a petroleum tank vehicle, then opening the sampler and raising it at a uniform rate so that it is no more taken 85 %full as it emerges from the liquid.

(1) Fill the copper weighted beaker and allow it to drain back into the storage tank. Also, rinse the sample container.

(2) Lower the weighted beaker to the bottom of the tank, and then jerk upward to remove the stopper. Raise the weighted beaker at a rate so that it is no more than 85 % full when it emerges from the liquid.

(3) Empty the product into sample container and repeat the sampling process until the container is approximately 90 degrees full. Close the cap on the sample container immediately.

b. Lower the weighted suction end of the tube connected to the vacuum sampler just below the top of the fuel level in the tank. Place the rubber grommet into a slop fuel can and pump the sampler. Draw approximately 100% of the volume of the sampler and tubing into the slop container to rinse the sampler.

NOTE

Do not rinse the vacuum sampler with fuel from the bottom of the fuel tank/cell.

c. Lower the weighted suction end of the tube connected to the vacuum sampler all the way to the bottom of the fuel tank/cell. Place the rubber grommet into the sample container and pump the vacuum sampler to draw fuel from the bottom of the fuel tank/cell. Fill the sample container to approximately 90% full. Close the cap on the sample container immediately.

NOTE

Newer equipment fuel screens are constructed so that vehicle operators cannot remove them. Removing the complete fuel cap/fuel screen assembly with a pipe wrench can access the fuel tank.

d. Smoke generator pump outlet.

(1) Attach the jumper cable cannon plug to the smoke generator electrical fuel pump.

(2) Connect the sampler to the fuel supply line (male-coupling half, quick disconnect) located next to the smoke generator electrical fuel pump and insert the sampler fuel hose into the sample container.

(3) Connect the jumper cable electrical clips to the M1 batteries to start pumping fuel into the sample container. Fill the sample container to approximately 90% full.

NOTE

This operation requires one person to operate the sampling device and one person to engage the smoke generator pump while the sample is being taken.

e. Fuel filter inlet will be taken by attaching a sampler to the fuel line before the filter separator inlet and drawing fuel from the lower fuel tank.

(1) Connect the sampler to the fuel supply line (female-coupling half, quick disconnect) located at the front of the pack and insert the sampler fuel hose into the sample container.

(2) Flush ½ to 3/4 of a gallon from the Bradley Fighting Vehicle fuel hose into a slop container by engaging the master power and engine accessory controls.

NOTE

This operation requires one person to operate the sampling device and one person to engage the master power and engine accessory controls while fuel is flowing into the sample container.

(3) Take sample by repeating procedures in step 2; however, fill sample container to approximately 90 % full. Close the cap on the sample container to approximately 90 % full.

C.4 CLASS 3 (P) SAMPLING PROCEDURES

a. Package containers smaller than 55 gallon drums are randomly selected by taking one or more packages in a given lot and submitting the sample in its original container. Procedures for calculating the required number of samples and required sample quantity for testing are provided in Appendix E.

b. Fifty-five gallon drums will be taken by inserting drum thief into the drum and taking an all-levels sample.

(1) Randomly select a drum from the lot and lay the drum on its side. Roll the drum 10 feet in one direction and then back to ensure mixture of the drum contents. Stand the drum upright so that the bung end is facing up.

(2) Wipe away any contaminants from the bung, and then remove the bung enclosure. Using a clean dry drum thief, cover one end of the drum thief with the thumb and lower it approximately 1 foot into the drum. Remove the thumb and allow product to enter the thief. Rinse the thief by rotating it so that product touches all areas of the thief that will be used to sample. Discard the rinse product.

(3) Take an all levels sample by slowly inserting the drum thief into the product and allowing the product to fill as the thief is lowered to the bottom. Place the thumb over the end of the thief, remove the thief and empty the contents into a clean one gallon sample can. Repeat the sampling process until the sample can is approximately 90 % full.

Table C- 1. Correction Factors for API Gravity

TEMP	FACTOR	TEMP	FACTOR	TEMP	FACTOR	TEMP	FACTOR
100	-3.1	80	-1.6	60	0.0	40	+1.7
99	-3.1	79	-1.5	59	+0.1	39	+1.8
98	-3.0	78	-1.4	58	+0.2	38	+1.8
97	-2.9	77	-1.4	57	+0.3	37	+1.9
96	-2.8	76	-1.3	56	+0.4	36	+2.0
95	-2.8	75	-1.2	55	+0.5	35	+2.1
94	-2.7	74	-1.1	54	+0.6	34	+2.2
93	-2.6	73	-1.0	53	+0.0	33	+2.3
92	-2.5	72	-1.0	52	+0.0	32	+2.4
91	-2.5	71	-0.9	51	+0.0	31	+2.5
90	-2.4	70	-0.8	50	+0.0	30	+2.5
89	-2.3	69	-0.7	49	+0.9	29	+2.6
88	-2.2	68	-0.6	48	+1.0	28	+2.7
87	-2.1	67	-0.6	47	+1.1	27	+2.8
86	-2.1	66	-0.5	46	+1.2	26	+2.9
85	-2.0	65	-0.4	45	+1.2	25	+3.0
84	-1.9	64	-0.3	44	+1.3	24	+3.1
83	-1.8	63	-0.2	43	+1.4	23	+3.2
82	-1.8	62	-0.2	42	+1.5	22	+3.2
81	-1.7	61	-0.1	41	+1.6	21	+3.3

Table C- 2. Petroleum Sampling Equipment

ITEM DESCRIPTION	PART NUMBER/NSN
ALL LEVEL SAMPLING	
COPPER WEIGHTED BEAKER	6695-00-359-9944
CORD, COTTON (ROPE)	4020-00-233-6556
BOTTOM SAMPLING	
VACUUM SAMPLER	6695-01-312-9091
(M1) SMOKE GENERATOR PUMP OUTFIT SAMPLER	
HOSE ASSEMBLY	4720-01-086-6824
JUMPER CABLES	
CONNECTOR PLUG, ELEC	5935-01-115-0215
WIRE, ELECTRICAL, 16 GAUGE	
CLIP, ELECTRICAL (RED)	5999-00-014-0432
CLIP, ELECTRICAL (BLACK)	5999-00-014-0431
(BRADLEY) BEFORE FUEL FILTER INLET	see TM 9-2350-284-24P-1
COUPLING HALF, QUICK MALE HOSE ASSEMBLY, NON-METALLIC	4730-01-115-3381 4720-01-122-4279
GENERALEQUIPMENT	
DRUM THIEF	6695-00-512-1816
HYDROMETER (39-51 API)	6630-00-245-8376
HYDROMETER CYLINDER	6640-00-244-4341
1 GALLON ROUND SAMPLE CAN W/BX	8110-01-436-7340
PETROLEUM AND LUBRICANT TAGS	DD Form 2927

APPENDIX D
CALCULATING SAMPLES SIZE AND REQUIRED SAMPLE QUANTITY FOR TESTING

D.1 CALCULATING SMAPLE SIZE

a. Regardless of the type of containerization, the number of packages for any product batch/lot is determined by counting the units of issue, i.e., if the unit of issue is BT (bottle) a box or case of 12 cans is counted as 12 items. Assuming there are 132 boxes of insect repellent, Lot #AAA, with 12 bottles in each box. The batch/lot size would be 132 x 12 = 1584.

D.2 REQUIRED SAMPLE QUANTITY FOR TESTING

a. Package products vary in both size and type of container. In order to test adequately any given product, a minimum amount of sample is required. Example: Some insect repellents come in a box of 12, with each individual plastic bottle containing 2 oz. The required sample quantity for testing the repellent is 8 oz. One sample would be 4 each 2-oz bottles, totaling the required sample amount of 8 oz.

b. Calculate the required amount of product required to make up one complete sample IAW Tables D-1 and D-2.

Table D-1 Number of Samples for Class III (P) Lot/Batch

Number of Packages in Lot/Batch	Number of Samples S-2 Level*
2 to 8	2
9 to 15	2
16 to 25	2
26 to 50	2
51 to 90	2
91 to 150	2
151 to 280	2
281 to 500	2
501 to 1,200	2
1,201 to 3,200	5
3201 to 10,000	5
10,001 to 35,000	5

*S2 level is extracted from ANZI 1.4. Number of samples is calculated from the Single Sampling Plan for Reduced Inspection using an AQL of 4.0.

c. Individual sample containers that make up the sample must come from the same batch/lot. Also, when more than one container is required to make up one sample, containers shall be taken from the same location. Containers drawn for different samples in the same lot/batch shall be randomly selected from a different location.

Table D-2. Required Sample Quantities for Testing

Type of Container	Size of Sample
Acid	1 qt
Anti-Freeze	1 gal
Cleaner, Lubricant	2 qt
Cleaning Compound	2 qt
Disinfectant, Food	2 pouches
Fuel Additive	2 qt
Grease	2.5 lbs
Hydraulic Fluids	3 qt
Insecticide, Aerosol	3 cans
Insecticide, Liquid	8 oz
Insulating Oil	2 qt
Lubricating Oil	3 qt
Solvents	1 gal

APPENDIX E
AOAP SAMPLING PROCEDURES AND SUPPLIES

E.1 TAKING ARMY OIL ANALYSIS PROGRAM (AOAP) SAMPLES.

a. When taking AOAP samples from your ground equipment, avoid contaminating the fluid sample by using clean sampling equipment and proper techniques. Often the reason for an abnormal sample is improper sampling techniques, which can cause contamination.

b. To make sampling easy, many components are equipped with a special sampling valve. These valves are installed according to instructions in equipment TM. To take a sample with a valve, you may need to start the engine to pressurize the system. Once the oil starts to flow, flush a small amount of oil from the line to clear out contamination, and then fill the sample bottle from the valve. Sampling oil from equipment that has no special sampling valve, then the equipment needed is listed in table E-1 below.

c. To obtain an oil sample using the pump method follow these steps:

(1) If the equipment has not been operated for the past 180 days, run the equipment to normal operating temperatures before sampling.

(2) Rest the tubing on the dipstick. Put a mark on the tubing where the dipstick ends. Measure about 10 inches beyond that mark before cutting the tubing.

(3) Loosen the T-handle on the pump. Insert the tubing about two inches into the pump head, making sure the tubing goes about 1/4-inch into the bottle. Tighten the handle just enough to grip the tubing firmly.

(4) Attach the bottle to the sampling pump. Remove the filler cap or dipstick from the oil reservoir.

(5) Insert the tubing into the reservoir. Be careful not to go past the mark you made on the tubing. If the tube touches the bottom or sides, sludge will be picked up, and the lab will request another sample.

(6) Hold the pump horizontally and pull the pump handle out slowly. Oil shall enter the bottle. Fill the bottle to the bottom of the bottle's neck or about 1/2 inch from the top. Push the vacuum relief valve (on top of the pump) to stop the flow. Be careful not to contaminate or get oil in the pump. If this occurs, clean the pump thoroughly before taking another sample.

(7) Unscrew the bottle from the pump and replace the bottle cap. Wipe off any oil with a clean rag.

(8) Remove the tubing from the reservoir. Loosen the T-handle and pull the tubing from the pump. Put the used tubing in an approved hazardous waste container.

(9) Replace the reservoir cover.

d. Whether the pump method or the valve method is used, the next steps are:

(1) On the sample bottle label, fill in the equipment's bumper number, component serial number, and hours and miles.

(2) Put that same information on the DD Form 2026 or the ULLS DA Form 5991E.

e. If you want more information on AOAP, read TB 43-0211, *AOAP Guide for Leaders and Users*. (Request your Publications Clerk order it.) It contains details on how AOAP works and answers frequently asked questions.

f. For further AOAP assistance, contact AOAP directly. Call DSN 645-0862, (256) 955-0862, or write to:

(1) USAMC Army Sustainment Command, Bldg. 3648C-1 (PS Magazine), Redstone Arsenal, AL 35898-5000

g. To ensure compliance with AOAP requirements, keep an adequate stock of sampling supplies on hand. This chart gives basic information about supplies needed to sample aeronautical and non-aeronautical equipment. If your equipment has a sampling valve, you do not need the oil sampling pump or tubing. It is recommended that a 90-day supply of expendables be stocked.

Table E-1. Sampling Supplies

Non-Aero NSN	Item	Aero NSN
8125-01-082-9697 (Note 1)	Sampling Bottle	8125-00-933-4414
4930-01-119-4030 N/A	Pump, Oil Sampling 3/8-in Plastic Tube 15-in long	N/A 4710-00-933-4415 4710-01-087-1629
30-in long 4720-00-964-1433	Nonmetallic tubing 1/4 in outside diameter	N/A
8105-00-290-0340	Shipping Sack	8105-00-290-0340
8105-00-837-7754 8105-00-837-7753	Plastic Bag	8105-00-837-7754
8125-01-193-3440	Mailer Kit (Note 2)	N/A

NOTES

(1) The 3 ounce non-aeronautical plastic sampling bottle will be used for submitting grease samples.

(2) The mailer kit, NSN 8125-01-193-3440, is leak proof and contains 24 non-aeronautical sampling bottles, plastic shipping sacks, and mailing cartons. It is used when shipping samples through the U.S. Postal Services.

APPENDIX F
ENGLISH-METRIC CONVERSION

Two tables describing English-metric conversion applicable to this manual are provided. For convenience in calculation, metric equivalents are expressed in two decimal places (nearest hundredth), wherever practical.

Table F-1. Standard English-Metric Equivalents

Volume (Liquids)	
1 fluid ounce =	29.57 milliliters
1 pint =	0.47 liter
1 quart =	0.95 liter
1 gallon =	3.79 liters Weight
Length	
1 inch =	2.54 centimeters
1 foot =	30.48 centimeters or 0.305 meters
39.37 inches =	1 meter

Weight	
1 ounce (avoirdupois) =	28.35 grams
1 pound (avoirdupois) =	453.59 grams or 0.454 kilogram

Table F-2. English-Metric Conversions

Volume (Liquids) Gallons = Liters	
1	3.79
5	18.95
50	189
55	

Weight Ounces = Grams	
1	28.35
10	283.50
(1000 grams = 1 kilogram)	

Volume (solids) Cubic feet = Cubic meter	
1	0.030
1.2	0.036
1.3	0.039
2	0.060
2.5	0.075

Cubic feet = Cubic meters	
6.0	0.18
6.5	0.195
8.4	0.25
9.0	0.27
10.0	0.030

Table F-2. English-Metric Conversions (Continued)

Volume (solids) Cubic feet = Cubic meter	
3.0	0.090
4.1	0.123
4.7	0.141
5.3	0.160

Cubic feet = Cubic meters	
12.0	0.36
30.0	0.90
60.0	1.80
66.5	1.995

Pounds = Kilograms	
1.0	0.45
2.2	1.0
10.0	4.54
11.0	4.99
50.0	22.70
52.0	23.61
65.0	29.61
75.0	34.05

Pounds = Kilograms	
100	45.4
125	56.75
144	66.37
150	68.10
200	90.80
500	227.0
1000	454.0
1700	771.8

Inches = Centimeters	
0.0258	0.07
0.03	0.08
0.0625	0.16
0.95(3/32”)	0.24
0.10	0.25
0.125(1/8”)	0.32
0.18 (3/16”)	0.48
0.375 (3/8”)	0.95
0.50	1.27
0.875 (7/8”)	2.2
0.90	2.29
NOTE: 10 millimeters equals 1 centimeter	

Inches = Centimeters	
1.0	2.56
1.5	3.81
2.0	5.08
2.6	6.35
3.0	7.62
4.0	10.16
5.0	12.70
10.0	25.40
60	127.0
100	254.0
144	365.76

Table F-2. English-Metric Conversions (Continued)

Feet = Meters	
1.0	0.305
3.28	1.0
25	7.62
50	15.24
150	45.73

Temperature Conversion
To Change degrees Celsius (C) to degrees Fahrenheit (F), multiply temperature by 1.8 and add 32 degrees F. To change degrees Fahrenheit (F) to degrees Celsius (C), subtract 32 from the temperature and divide by 1.8.

Degrees Fahrenheit = Degrees Celsius	
0	-18
32	0
35	2
46	8
100	38
212	100

APPENDIX G
ACRONYMS

ACOM: Army Command
AFSB: Army Field Support Brigade
AFSBn: Army Field Support Battalion
AIN: Ammunition Information Notice
AIOE: Associated Items of Equipment
AMC: Army Materiel Command
AMG: Antenna Mast Group
AMDF: Army Master Data File
AOAP: Army Oil Analysis Program
APS: Army Prepositioned Stock
APU: Aviation Power Unit
AR: Army Regulation
ARCD: Army Reserve Component Database
ARCENT: Army Central Command
ASC: Army Sustainment Command
ASL: Authorized Stockage List
ASTM: American Society for Testing and Materials
AWRAP: Army War Reserve Automated Process
AWRDS: Army War Reserve Deployment System
BD: Barge Derrick
BII: Basic Issue Item
BVFS: Bradley Vehicle Fighting System
CBU: Calibration Before Use
CCSS: Commodity Command Standard System
CEU: Computer Electronic Unit
CF: Causeway Ferry
CFR: Code of Federal Regulations
CGA: Compressed Gas Association
CH: Controlled Humidity
CHT: Collecting, Holding, and Transfer
CJCS: Chairman, Joint Chiefs of Staff
COEI: Component of End Items
COMSEC: Communications Security
CONUS: Continental United States
COSIS: Care of Supplies in Storage
COTS: Commercial Off the Shelf
CRG: Communications Relay Group
CSA: Chief of Staff Army
CSC: Convention for Safe Containers
CTA: Common Tables of Allowances
DA: Department of Army
DAC: Department of the Army Civilian
DA PAM: Department of the Army Pamphlet
DD: Defense Department
DDL: Digital Data Link
DEPMEDS: Deployable Medical Systems
DES: Dental Equipment Set
DH: Dehumidification
DLA: Defense Logistics Agency
DoD: Department of Defense
DODAAC: Department of Defense Activity Address Code
DODIC: Department of Defense Identification Codes
DSN: Defense Switched Network
DRRS-A: Defense Readiness Reporting System – Army
ECS: Engagement Control Station
ECS: Environmentally Compliant Solvents
EPP: Electric Power Plant

EPU: Electric Power Unit
FAU: Fuel Filtration/Additive Unit
FC: Floating Causeway
FLIPL: Financial Liability Investigation of Property Loss
FY: Fiscal Year
GAA: Grease Automotive and Artillery
GCSS-A: Global Combat System-Army
GSA: General Services Administration
HR: Hand Receipt
HRH: Hand Receipt Holder
HLPS: Heavy Lift Prepositioned Ship
IAW: In Accordance With
ICC: Information and Coordination Central
ICP: Inventory Control Point
ICW: In Coordination With
IFF: Identification Friend or Foe
IMRF: Instrument Master Record File
ISR: Inventory System of Record
ISOPAK: International Standard Operational Packages
IUID - Item Unique Identification
LCM: Landing Craft Mechanized
LDAC: Logistics Data Analysis Center
LCU: Landing Craft Utility
LIN: Line Item Number
LMP: Logistics Modernization Program
LO: Lubrication Orders
LS: Launching Station
LMSR: Large Medium Speed Roll-on/Roll-off
LSTS: Launching Station Test Set
LT: Large Tug
LTI: Limited Technical Inspections
LTS: Long-term Storage
MAB: Mobile Assault Bridge Ferry
MAC: Maintenance Allocation Chart
MCPE: Modular Collective Protection Equipment
MCS: Modular Causeway System
MER: Medical Equipment Repairs
MES: Medical Equipment Sets
MHE: Materials Handling Equipment
MLST: Medical Logistics Support Team
MMS: Medical Materiel Sets
MOS: Military Occupational Specialties
MRAP: Mine Resistant Ambush Protected
MRC: Major Regional Conflict
MRCTS: Missile Round Cable Test Set
MRE: Meals Ready to Eat
MRSL: Medical Recommended Stockage List
MSC: Major Subordinate Command
MTOE: Modified Table of Organization and Equipment
MWO: Modification Work Order
MWT: Modular Warping Tug
NAT: Not to Accompany Troops
NCM: Non-cyclic Maintenance NMC: Non-Mission Capable
NICP: National Inventory Control Point
NRC: U.S. Nuclear Regulatory Commission NSN: National Stock Number
OBSL: On Board Spares List
OCCM: On Condition Cyclic Maintenance
OCONUS: Outside the Continental United States
ODS: Ozone Depleting Substance

OEF: Operation Enduring Freedom
OIF: Operation Iraqi Freedom
OPP: Offload Preparation Party
OSHA: Occupational Safety and Health Act
OTSG: Office of the Surgeon General
PB: Property Book
PBIC: Property Book Identification Code
PBO: Property Book Officer
PBTC: Property Book Team Chief
PBUSE: Property Book Unit Supply Enhanced
PHRH: Primary Hand Receipt Holder
PMCS: Preventive Maintenance Checks and Services
POC: Point of Contact
POL: Petroleum, Oils, and Lubricants
PSCC: Packaging, Storage, and Containerization Center
QA: Quality Assurance/
QC: Quality Control
QASAS: Quality Assurance Specialist Ammunition Surveillance
QSL: Quality Status Listing
RFID - Radio-frequency identification
RH: Relative Humidity
RRT: Radio Relay Terminal RS: Radar Set
RSO: Radiation Safety Officer
SAMS-E: Standard Army Maintenance System – Enhanced
SARSS: Standard Army Retail Supply System
SDDC: Surface Deployment and Distribution Command
SDR: Supply Discrepancy Report
SDS: Standard Depot System SGD: Sagami General Depot
SICC: Service Item Control Center
SICO: System Integration and Checkout Procedures
SKO: Sets, Kits, & Outfits
SLWT: Side Loadable Warping Tug
SN: Serial Number
SOP: Standard Operating Procedure
SOR: Source of Repair
SOUM: Safety of Use Messages
SPCCP: Spill Prevention Control and Countermeasures Plan
SPI: Special Packaging Instruction
ST: Small Tug
TAC-S: Tactical Auxiliary Crane Ship
TAMMS: The Army Maintenance Management System
TAT: To Accompany Troops
TAV: Total Asset Visibility TBM: Tactical Ballistic Missile
TDA: Table of Distribution and Allowances
TM: Technical Manual
TMDE: Test, Measurement, and Diagnostic Equipment
TWPS: Transmitter Waveguide Pressurization System
TWUD: Tactical Weapon Control Computer Unit Diagnostic
UAL: Unit Assemblage Listing
UHF: Ultrahigh Frequency
UIT: Unique Item Tracking
USAPC: US Army Petroleum Center
USAMMA: US Army Medical Materiel Agency
VCI: Volatile Corrosion Inhibitor
VERP: Vehicle Exercise and Reprocessing Program
WEB-YND: Watercraft Equipment Base – Yokohama North Dock
WES-KNB: Watercraft Equipment Site – Kuwait Naval Base
WT: Warping Tug
WPM: Wood Packaging Material

For a full listing of Army abbreviations and acronyms, see the following website: https://www.arims.army.mil/ARIMS/App/MainPage.aspx.

APPENDIX H
RADIATION SAFETY POINTS OF CONTACT

This appendix identifies the AMC Major Subordinate Command's RSOs and Web sites.

U.S. Army Communications-Electronics Command
6630 Raritan Ave, Building 3200
ATTN: AMEL-SF
Aberdeen Proving Ground, MD 21005-1850
DSN648-3790/Commercial: 443-395-3790
DSN Fax 443-395-3836
https://cecom.aep.army.mil/gstaff/DS_US

U.S. Army Aviation and Missile Command
ATTN: AMSAM-SFO-R
Redstone Arsenal, AL 25898-5000
DSN; 788-3250/ Commercial: 256-842-3250
FAX: DSN 897-2111/ Commercial: 256-313-2111

US Army TACOM
ATTN:AMSTA-MSP-Z
Mail Stop 485
6501 E. 11 Mile Rd
Warren, MI 48397-5000
DSN 786-7635/6194; Commercial 586-282-7635/6194
FAX : DSN 786-5277
usarmy.detroit.tacom.mbx.lcmc-safety

U.S. Joint Munitions Command
ATTN: AMJM-MLT
1 Rock Island Arsenal, Rock Island, IL
61299-6000 DSN793-0338/2988
Commercial: (309) 782-0338

APPENDIX I
PATRIOT MISSILE SYSTEMS INTEGRATION AND CHECKOUT (SICO) PROCEDURES

I.1 PATRIOT MISSILE SYSTEM INTEGRATION AND CHECKOUT (SICO). The SICO process is divided into two separate stages. COMSEC must be available for SICO. Selected stage 2 activities (marked with an *) are performed as part of the non-cyclic maintenance exercising.

a. Stage 1- Equipment preparation: Power-off technical inspections will be conducted and results recorded on DA Form 5988E. The equipment will be emplaced and initialized per equipment technical manuals.

b. Stage 2 - Demonstration & Acceptance: The SICO will be conducted IAW the procedures below. The purpose of the SICO is to demonstrate that end items are in an operational status for short-notice handoff.

(1) System Baseline Tests. Final hard copy printouts of RS and ECS system baseline tests will be dated, signed, and maintained on location.

(a) ECS / ICC:

1. Load and run TWUD program in its entirety.

2. Hardcopy all ECS/ICC diagnostics results. Verify that all D&C indicators illuminate.

3. Establish communication with another ECS/ICC, utilizing all UHF radio stacks. Pass digital data between major end items to ensure equipment operability. Additionally, ICCs are to have modems loop-backed to ensure their operability.

4. Load K-7 / System Exerciser and verify communication with radar set.

5. Establish communication with Launching Station by fiber optic cable and radio. Verify digital data link is operable (Green DDL) on each ECS.

6. Integrate ECS/ICC with AMG and verify that interface is functioning properly.

7. Remote shut down of the RS, EPPIII, and all LS will be performed and verified.

8. A “retrieve and compare” will be performed.

9. A correlation with at least two ECS will be performed with the ICC.

(b) RADAR Set

1. Perform all radar diagnostics in fault localization and hard copy all tests and results.

2. Load K-7/System Exerciser and run in radiate (TBM mode) for two hours in the morning and two hours in the afternoon. Operational assessment and fault data TABs shall be called up and printed to HCU when any change in status occurs.

3. Verify TWPS is performing properly.

(c) Launcher Station:

1. The 15KW generator will be checked in accordance with pertinent TM.

2. Both fiber and radio communication with the ECS will be demonstrated. Green DDL, Fuel, and Operate functions will be verified. Missile Round Simulators will be used on all ports to verify missile count.

(d) AMG

1. Perform all AMG tests in accordance with pertinent TM.

2. Integrate AMG with a CRG, ICC, or ECS and verify that the AMG operates and masts rotate.

3. Verify that amplifier output is within specification; this requirement includes the final drive.

(e) CRG

1. Perform UHF radio integration with ECS/ICC and loop digital data thru all stacks to verify system operability.

2. Modems will be placed in loop-back to ensure their operability.

3. Integrate AMG with CRG and verify that interface is performing properly.

I.2 All equipment will be returned to storage configuration at SICO completion.

APPENDIX J
USAMMA MEDICAL LOGISTICS SUPPORT TEAM

J.1 USAMMA MEDICAL LOGISTICS SUPPORT TEAM (MLST) Representing the AMEDD Class VIII commodity is the USAMMA MLST. This 32-member team is manned by USAMMA. The Team members are a highly skilled group of medical logisticians that perform their MLST requirements in their day-to-day positions. The MLST has medical maintenance, ground maintenance, and supply personnel. The MLST can perform its mission in the most austere environments, and is equipped with TEMPER, ISO Tactical Shelters, automation, and communication equipment. Weight and cube requirements for the MLST's deployment is 45,000 pounds or 4,000 cubic feet, which will fit in one C-130 or one C-141.

J.2 The MLST is a Table of Distribution & Allowances (TDA) organization consisting of Medical Logistics (MEDLOG) personnel (military, Department of the Army civilians, and contractors) from the USAMMA.

J.3 The MLST normally requires augmentation from the gaining tactical unit (GTU) or a MEDLOG unit to complete its mission.

J.4 The MLST will normally deploy under the operational control (OPCON) of AMC LSE. The MLST supports the reception, staging and onward movement issue of APS unit sets and sustainment stock pre-positioned in the Area of Operations (AO) or pushed in from the AFLOAT program or Continental United States (CONUS).

J.5 The MLST will provide medical materiel and maintenance capability, equipment accountability, and transfer support of reception operations at aerial and seaports of debarkation in support of the APS transfer mission. This includes the introduction of additional Class VIII materiel not previously pre- positioned.

J.6 The MLST remains OPCON to the LSE until the establishment of a Theater Support Command (TSC).

J.7 The MLST coordinates with the senior medical Command & Control (C2) organization in the theater to determine priorities for transfer and onward movement of medical units.

J.8 The MLST will transition their mission to the theater MEDLOG battalion or Medical Logistics Management Center (MLMC). Upon completion of the APS transfer mission, the USAMMA MLST will receive assignment instructions from the Commander, USAMMA, in conjunction with the senior medical C2 organization in the theater. When the mission transition is completed, the MLST will be redeployed to CONUS. At the completion of the contingency/operation, the MLST may be redeployed to the AO to support the redeployment of US forces and medical materiel from the AO to follow-on CONUS or Outside Continental United States (OCONUS) locations.

J.9 They routinely execute the sustainment requirements for the USAMMA Strategic Capabilities and Materiel Directorate (SCMD), which manage Class VIII APS items. For further information on the MLST, refer to FM 3-35.1, or contact:

USAMMA
Chief, Force Sustainment Division
DSN 343-1964 or commercial (301) 619-1964

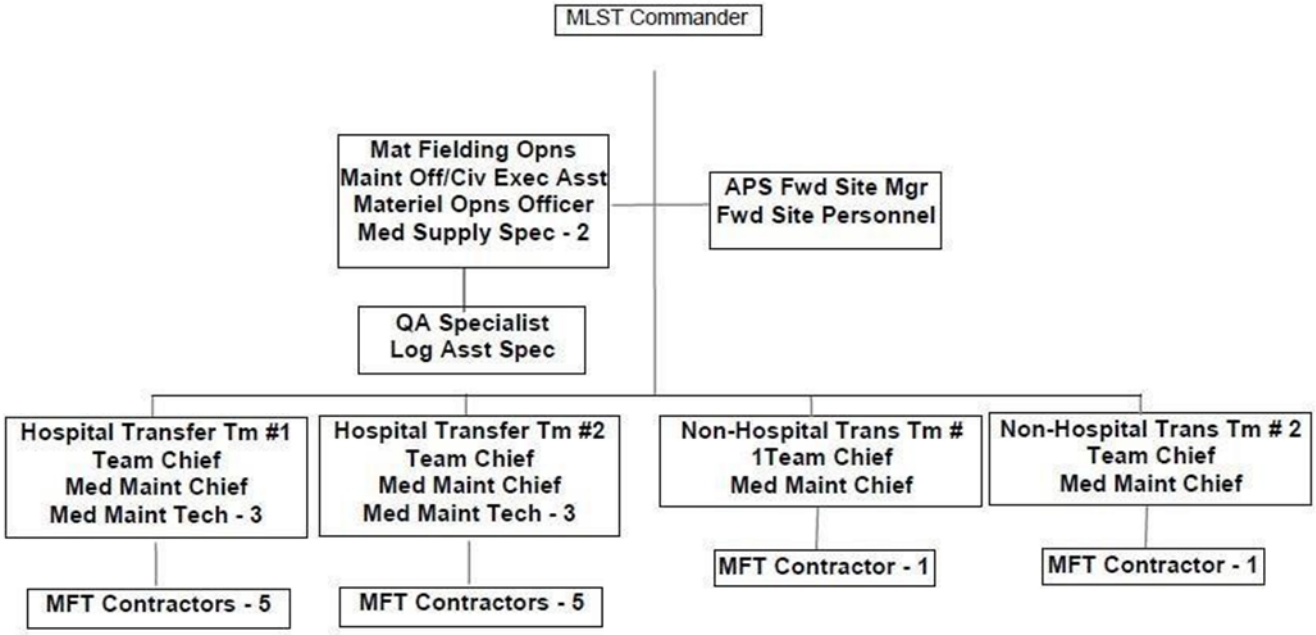

Figure J-1. MLST Organizational Structure

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	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

DA FORM 2028, FEB 74 REPLACES DA FORM 2028, 1 DEC 68, WHICH WILL BE USED USAPA V3.01

Figure J-2. DA Form 2028

TM 38-470

28 Jan 2022

By Order of the Secretary of the Army:

JAMES C. MCCONVILLE
General, United States Army
Chief of Staff

Official:

MARK F. AVERILL
Administrative Assistant
to the Secretary of the Army
2202552

DISTRIBUTION:
Distributed in electronic media only (EMO).

PIN: 079099-00