FORM NRC-2
(7-77)
10 CFR 40

Approved by GAO
R0203

U.S. NUCLEAR REGULATORY COMMISSION

APPLICATION FOR SOURCE MATERIAL LICENSE

Pursuant to the regulations in Title 10, Code of Federal Regulations, Chapter 1, Part 40, application is hereby made for a license to receive, possess, use, transfer, deliver or import into the United States, source material for the activity or activities described.

1. (Check one)
- ☐ (a) New license
- ☐ (b) Amendment to License No. _____
- ☒ (c) Renewal of License No. SUC-1275
- ☐ (d) Previous License No. _____

2. NAME OF APPLICANT
Seneca Army Depot

3. PRINCIPAL BUSINESS ADDRESS
Romulus, New York 14541

4. STATE THE ADDRESS(ES) AT WHICH SOURCE MATERIAL WILL BE POSSESSED OR USED
Seneca Army Depot, Romulus, New York 14541

5. NAME OF PERSON TO BE CONTACTED CONCERNING THIS APPLICATION
Mr. Thomas J. Stincic

6. TELEPHONE NO. OF INDIVIDUAL NAMED IN ITEM 5
315-585-4481 Ext. 261

7. DESCRIBE PURPOSE FOR WHICH SOURCE MATERIAL WILL BE USED
See Chapter 1.

8. STATE THE TYPE OR TYPES, CHEMICAL FORM OR FORMS, AND QUANTITIES OF SOURCE MATERIAL YOU PROPOSE TO RECEIVE, POSSESS, USE, OR TRANSFER UNDER THE LICENSE

(a) TYPE	(b) CHEMICAL FORM	(c) PHYSICAL FORM (*Including % U or Th.*)	(d) MAXIMUM AMOUNT AT ANY ONE TIME *(kilograms)*
NATURAL URANIUM			
URANIUM DEPLETED IN THE U-235 ISOTOPE	.0075% Alloy remainder depleted U-238	Depleted Uranium Alloy 0.71bs.-99.7% U-238	9 million pounds
THORIUM (ISOTOPE)			

(e) MAXIMUM TOTAL QUANTITY OF SOURCE MATERIAL YOU WILL HAVE ON HAND AT ANY TIME *(kilograms)*
9 million pounds

9. DESCRIBE THE CHEMICAL, PHYSICAL, METALLURGICAL, OR NUCLEAR PROCESS OR PROCESSES IN WHICH THE SOURCE MATERIAL WILL BE USED, INDICATING THE MAXIMUM AMOUNT OF SOURCE MATERIAL INVOLVED IN EACH PROCESS AT ANY ONE TIME, AND PROVIDING A THOROUGH EVALUATION OF THE POTENTIAL RADIATION HAZARDS ASSOCIATED WITH EACH STEP OF THOSE PROCESSES
See Chapter 2.

10. LIST THE NAMES AND ATTACH A RESUME OF THE TECHNICAL QUALIFICATIONS INCLUDING TRAINING AND EXPERIENCE OF APPLICANT'S SUPERVISORY PERSONNEL AND THE PERSON RESPONSIBLE FOR THE RADIATION SAFETY PROGRAM (OR OF APPLICANT IF AN INDIVIDUAL).
See Chapter 3.

11. DESCRIBE THE EQUIPMENT AND FACILITIES WHICH WILL BE USED TO PROTECT HEALTH AND MINIMIZE DANGER TO LIFE OR PROPERTY AND RELATE THE USE OF THE EQUIPMENT AND FACILITIES TO THE OPERATIONS LISTED IN ITEM 9. INCLUDE: (a) RADIATION DETECTION AND RELATED INSTRUMENTS (including film badges, dosimeters, counters, air sampling, and other survey equipment as appropriate. The description of radiation detection instruments should include the instrument characteristics such as type of radiation detected, window thickness, and the range(s) of each instrument).
See Chapter 4.

(b) METHOD, FREQUENCY, AND STANDARDS USED IN CALIBRATING INSTRUMENTS LISTED IN (a) ABOVE, INCLUDING AIR SAMPLING EQUIPMENT (for film badges, specify method of calibrating and processing, or name supplier).
See Chapter 5.

11(c) VENTILATION EQUIPMENT WHICH WILL BE USED IN OPERATIONS WHICH PRODUCE DUST, FUMES, MISTS, OR GASES, INCLUDING PLAN VIEW SHOWING TYPE AND LOCATION OF HOOD AND FILTERS, MINIMUM VELOCITIES MAINTAINED AT HOOD OPENINGS AND PROCEDURES FOR TESTING SUCH EQUIPMENT. Fumes and dust will be controlled by local collection system with face velocity of 150 linear feet per min. Exhaust system will be equipped with filters to preclude particles being discharged into the environment. A volumeter will be used to check airflow as a means of certifying the system.

12 DESCRIBE PROPOSED PROCEDURES TO PROTECT HEALTH AND MINIMIZE DANGER TO LIFE AND PROPERTY AND RELATE THESE PROCEDURES TO THE OPERATIONS LISTED IN ITEM 9, INCLUDE: (a) SAFETY FEATURES AND PROCEDURES TO AVOID NONNUCLEAR ACCIDENTS, SUCH AS FIRE, EXPLOSION, ETC., IN SOURCE MATERIAL STORAGE AND PROCESSING AREAS.

See Chapter 6, 8, 9.

(b) EMERGENCY PROCEDURES IN THE EVENT OF ACCIDENTS WHICH MIGHT INVOLVE SOURCE MATERIAL.

See Chapter 7, 9.

(c) DETAILED DESCRIPTION OF RADIATION SURVEY PROGRAM AND PROCEDURES. The Radiological Protection Officer has the authority to suspend operations if in his judgement a hazard exists. Chapter 9, SEAD regulation 385-1 outlines the local Radiation Survey Program & Procedures. Portions of the regulation which apply to this license application has been identified by a solid line in the left hand margin adjacent to the paragraph (s).

13 WASTE PRODUCTS: *If none will be generated, state "None" opposite (a), below. If waste products will be generated, check here* ☐ *and explain on a supplemental sheet:*

(a) Quantity and type of radioactive waste that will be generated.

(b) Detailed procedures for waste disposal.

Waste products will be disposed of IAW AR 385-11, TM 3-261.

14. IF PRODUCTS FOR DISTRIBUTION TO THE GENERAL PUBLIC UNDER AN EXEMPTION CONTAINED IN 10 CFR 40 ARE TO BE MANUFACTURED, USE A SUPPLEMENTAL SHEET TO FURNISH A DETAILED DESCRIPTION OF THE PRODUCT, INCLUDING:

(a) PERCENT SOURCE MATERIAL IN THE PRODUCT AND ITS LOCATION IN THE PRODUCT.

(b) PHYSICAL DESCRIPTION OF THE PRODUCT INCLUDING CHARACTERISTICS, IF ANY, THAT WILL PREVENT INHALATION OR INGESTION OF SOURCE MATERIAL THAT MIGHT BE SEPARATED FROM THE PRODUCT.

(c) BETA AND BETA PLUS GAMMA RADIATION LEVELS (*Specify instrument used, date of calibration and calibration technique used*) AT THE SURFACE OF THE PRODUCT AND AT 12 INCHES.

(d) METHOD OF ASSURING THAT SOURCE MATERIAL CANNOT BE DISASSOCIATED FROM THE MANUFACTURED PRODUCT. N/A

CERTIFICATE

(This item must be completed by applicant)

15. *The applicant, and any official executing this certificate on behalf of the applicant named in Item 2, certify that this application is prepared in conformity with Title 10, Code of Federal Regulations, Part 40, and that all information contained herein, including any supplements attached hereto, is true and correct to the best of our knowledge and belief.*

BY: Robert J. Hudak
(Signature)

ROBERT J. HUDAK, Colonel, OrdC
Commanding
(Print or type name)

Dated _____

(Title of certifying official authorized to act on behalf of the applicant)

WARNING: 18 U.S.C. Section 1001; Act of June 25, 1948; 62 Stat. 749; makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

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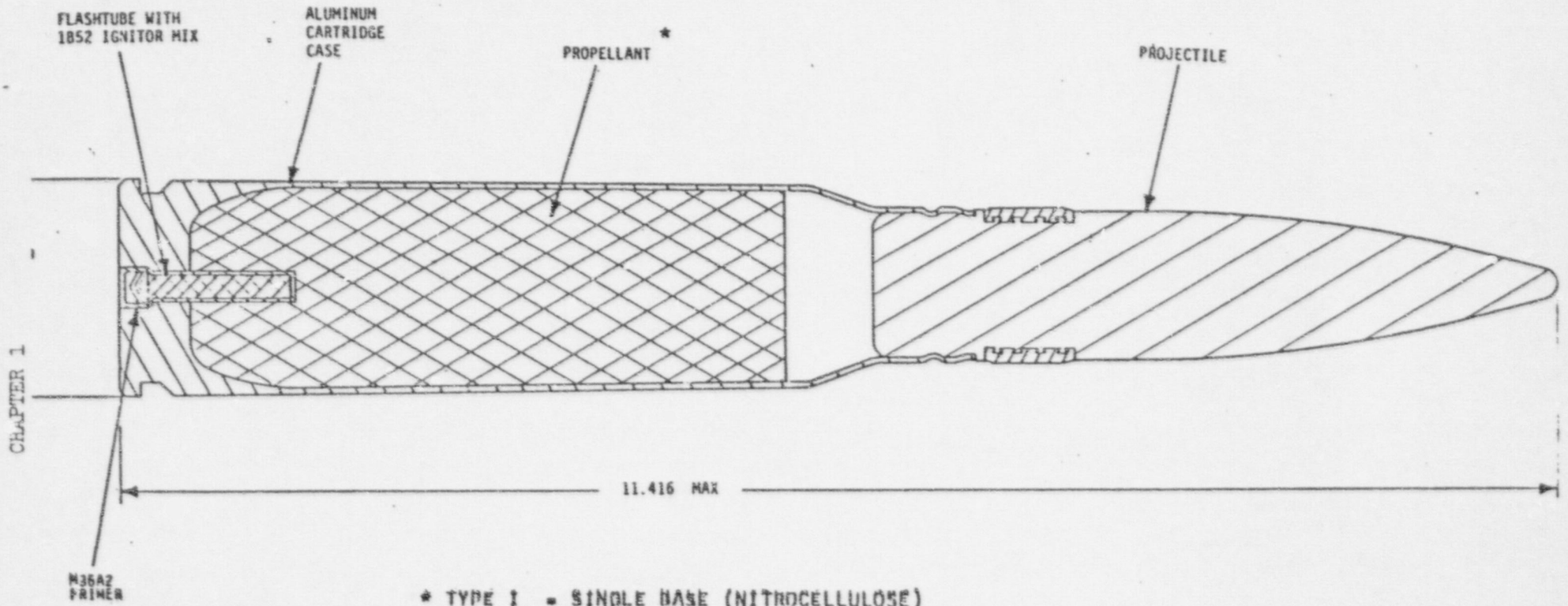


* TYPE I - SINGLE BASE (NITROCELLULOSE)
TYPE II - DOUBLE BASE (NITROCELLULOSE - NITROGLYCERIN)

FIGURE 2-1 BASIC CONFIGURATION, 30MM CARTRIDGE

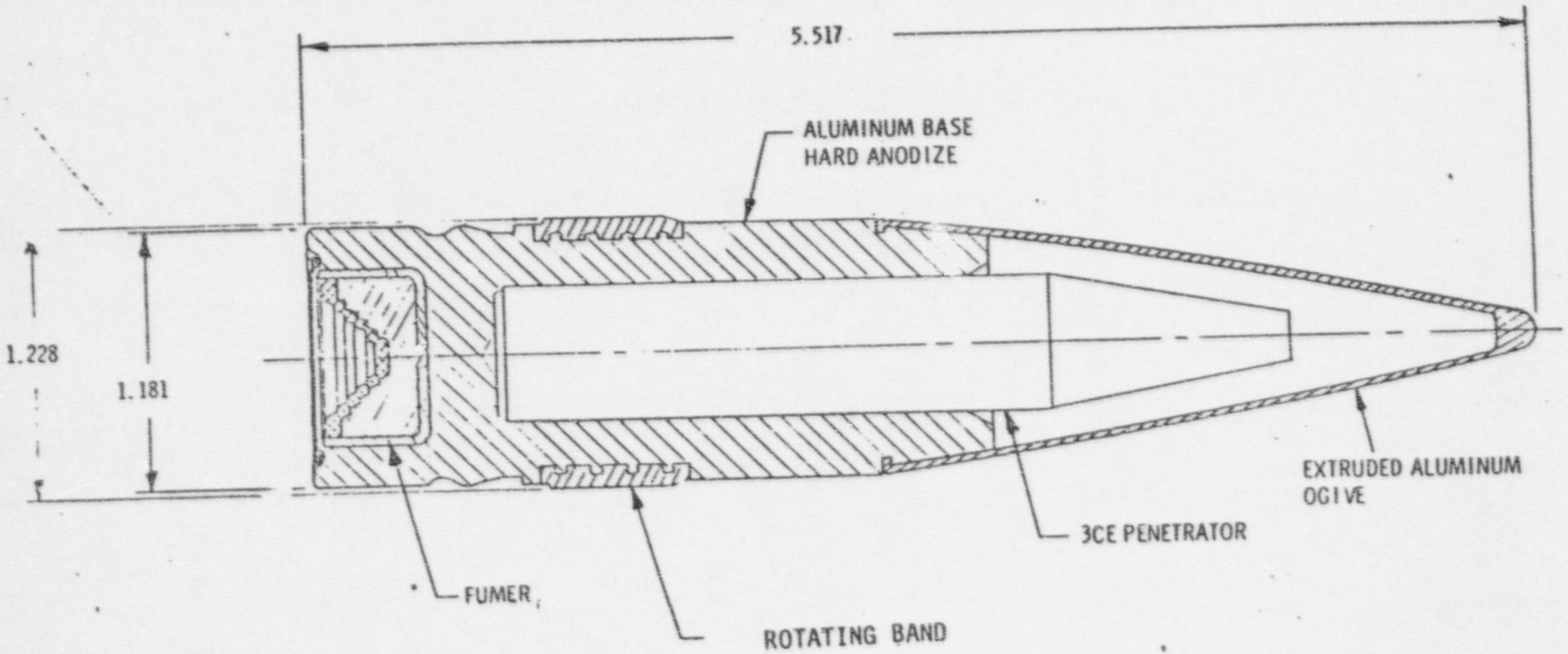


FIGURE 2-2 APIT PROJECTILE

CHAPTER 1

1. Source material, depleted uranium, as an integral part of a 30MM Armor Piercing Incendiary Tracer (APIT) Cartridge will be received at this installation and stored in igloo magazines as War Reserve Material. (Note: Cartridge, as used in the context of this license application, means the projectile, containing the depleted uranium core, and the cartridge case containing the propellant required to propel the projectile from a weapon. The projectile and cartridge case are a one piece unit with the neck of the cartridge case crimped around the projectile.)

2. Physical description - The 30MM APIT cartridge is basically cylindrical in shape, slightly tapering from the base to neck to accommodate the projectile. The projectile has an aluminum body referred to as a windscreen which holds the depleted uranium penetrator.

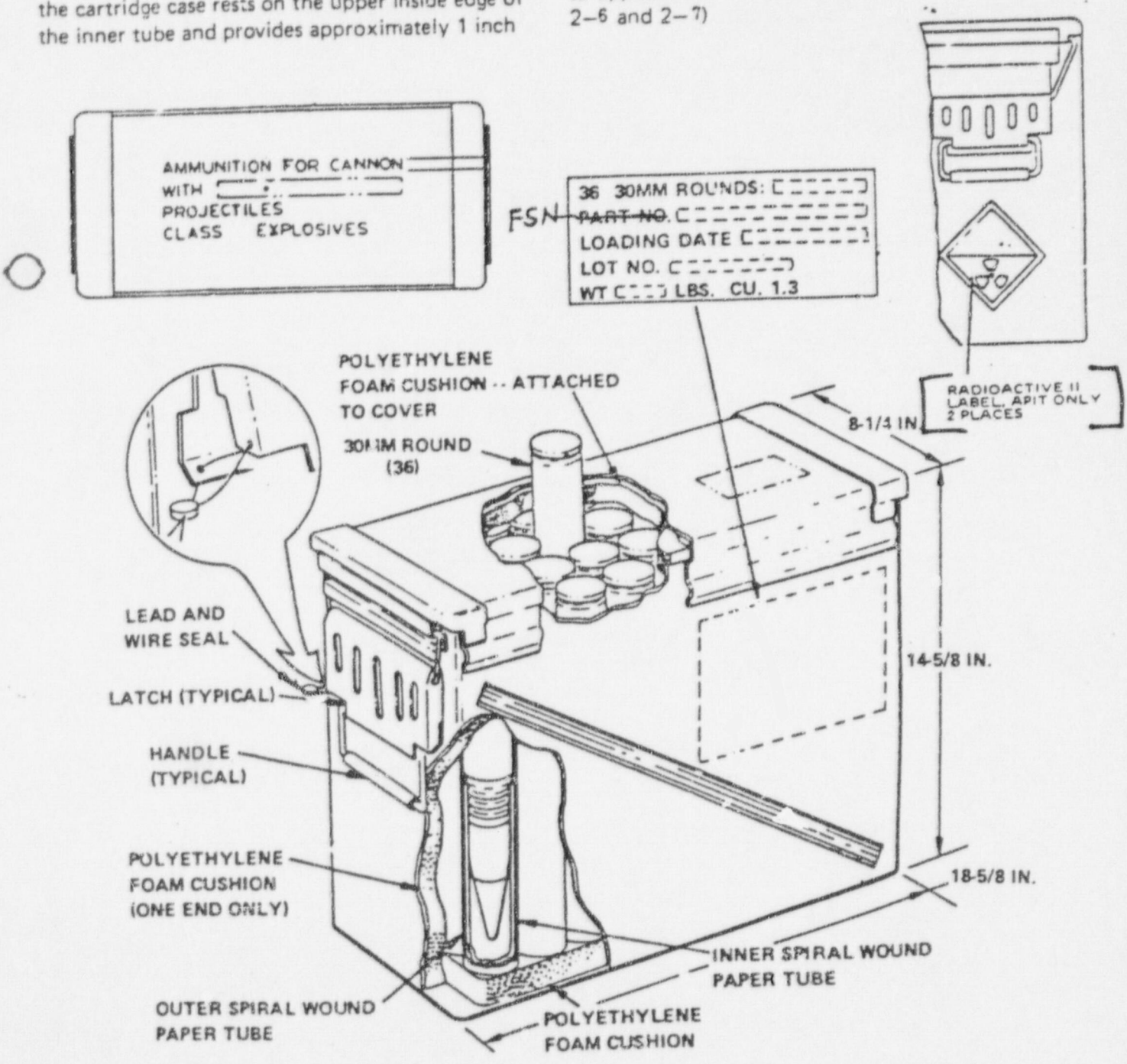
3. a. Packing - Each 30MM cartridge is packed separately in a tubular assembly consisting of two spiral-wound paper tubes telescoped together and glued. The outer tube has an inside diameter which fits the cartridge case, the inner tube has an inside diameter which fits the projectile. The shoulder of the cartridge case rests on the upper inside edge of the inner tube and provides approximately one inch clearance between the tip of the projectile and the bottom of the tube. Thirty-six individually packed rounds are packed in an M548 shipping container. A one-half inch polyethylene foam cushion is placed in the bottom and at one end of the container to provide a firm pack. A one and one-quarter inch thick cushion is glued to the inside of the cover to hold the cartridge in place when the cover is closed. Two metal/lead seals are affixed to opposite corners for security purposes. Inclosure 1 to this supplement provides a visual portrayal of the method of packing.

b. CNU-309/E, ALS container is a 15 inch wide, 51.5 inch long, 45.3 inch high steel walled box with a removable, top opening lid, which is secured to the box by a fastener located on the top and ends of the box (one on each end). Each container is designed to accommodate 600 rounds (588 actually loaded) linked together in a plastic tube belt. The box is mounted on a steel channel base which has forklift access openings and alignment holes to mate with dimples on the cover during stacking. Two angle iron guides are welded, horizontally across each side of the box providing stiffening and allowing adjacent containers to be secured together with locking pins inserted in holes in the guides. Four locking pins, two on each side, are attached to each end of the box by braided steel wire. A clip is installed in the end of each pin to insure that it does not vibrate out of the holes during transportation. The normal shipping configuration is two containers pinned together. Since the containers were designed for 600 rounds and are loaded with 588, there is a void in the top of the container that is filled with cushioning material. Strapping and dunnage are then used to band the two containers together in accordance with Air Force Drawing No. 785040 as required by Air Force Container Certification No. 7851.

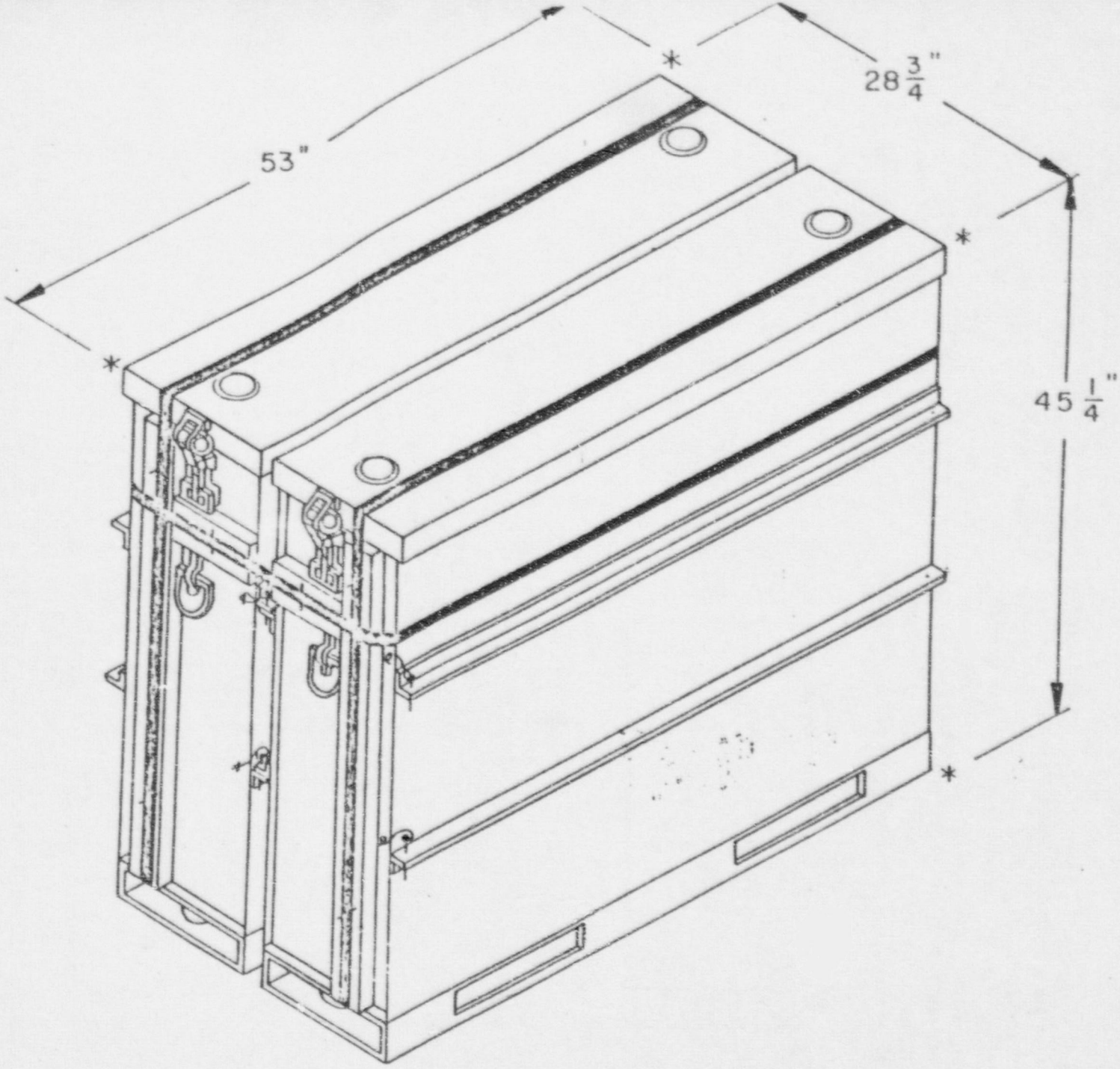
(c) CNU-332/E container is the same as the CNU-309/E container except for a few minor changes. Quantity of rounds per container is 575 plus sufficient empty LTCS or foam to take up the roid space. The cover is secure with four (4) each bolts; flat washer and retainer bolt. Torque cover bolts to 100 inch pounds after loading container with ammunition and filler. Reference Wayne H. Coloney Company, Inc. Drawing number 5073K107.

2– 15. PACKING

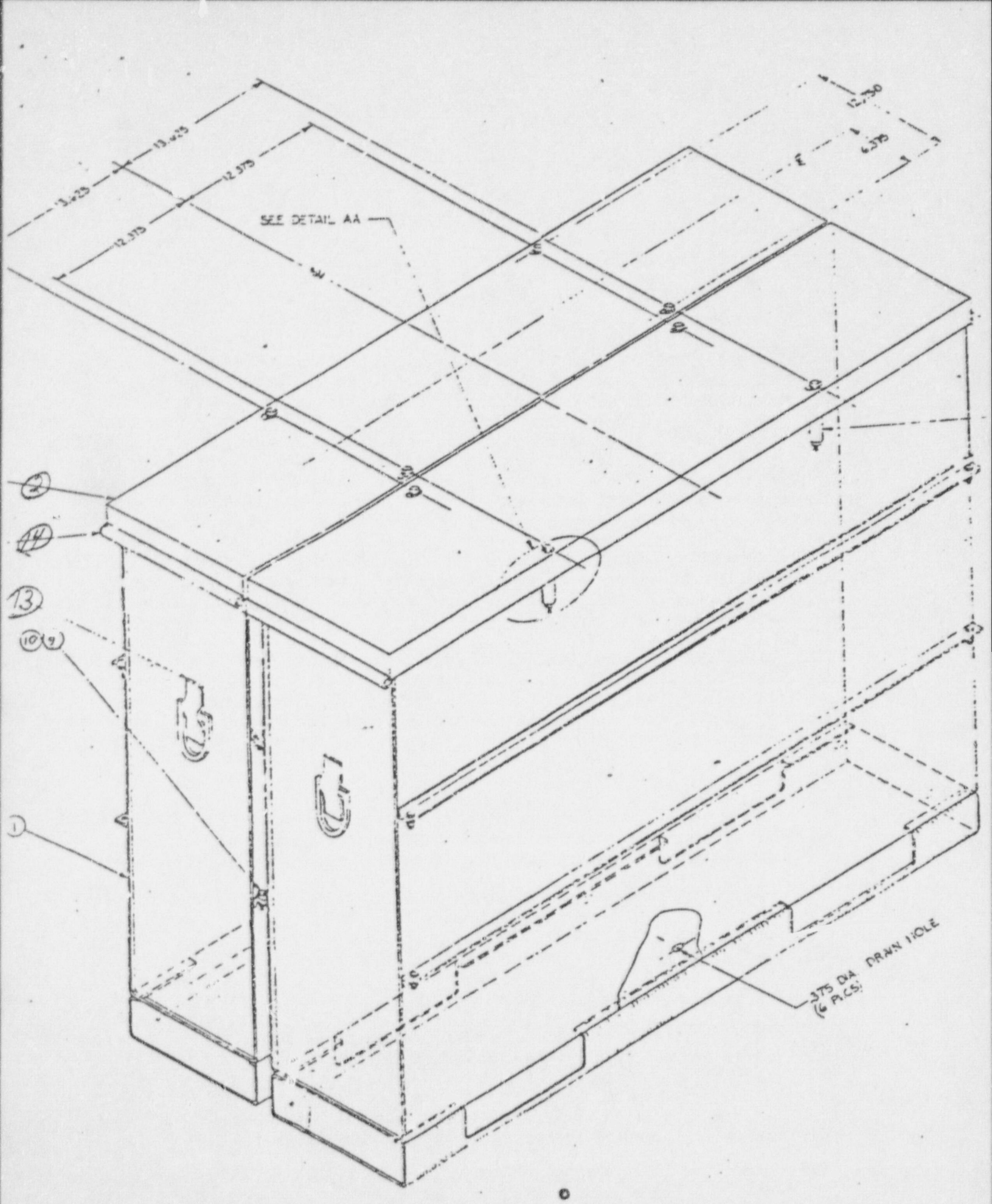
2– 16. Each 30MM ammunition cartridge is packed separately in a tubular assembly consisting of two spiral-wound paper tubes telescoped together and glued. The outer tube has an inside diameter which fits the cartridge case, the inner tube has an inside diameter which fits the projectile. The shoulder of the cartridge case rests on the upper inside edge of the inner tube and provides approximately 1 inch clearance between the tip of the projectile and the bottom of the tube. 36 individually packed rounds are packed in the M548 shipping container. A ½-inch polyethylene foam cushion is placed in the bottom and at one end of the container to provide a firm pack. A 1½-inch thick cushion is glued to the inside of the cover to hold the cartridge in place when the cover is closed. Two metal/lead seals are affixed to opposite corners for security purposes. (Figures 2–6 and 2–7)



M548 Shipping Container Outer Package/Markings



TWIN-PACK UNIT CN4-309/E



CN-332/E

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS ARMAMENT DIVISION (AFSC)
EGLIN AIR FORCE BASE, FLORIDA 32542

AD CONTAINER CERTIFICATION

AF-78-51
(REISSUED)

This Certification of Equivalency is issued pursuant to 49 CFR 173.7(a) of the Department of Transportation Hazardous Materials Regulations, under authority established in AFR 80-18 and AFSC/AFLC Regulation 800-29.

1. CONTAINERS. Two container configurations are authorized: (a) CNU-309/E 30mm Ammunition ALS Container, Wayne Colony Dwg No. 1444J050, assembled in pairs, strapped and dunnaged to AF Dwg No. 785040, Rev B, and (b) CNU-332/E 30mm Ammunition Shipping and Storage Container, Wayne Colony Dwg No. 1444J050, Rev R, assembled in pairs to Wayne Colony Dwg No. 5073K107-1.

2. COMMODITY. GAU-8, 30mm ammunition for cannon with explosive projectiles and ammunition for cannon with solid projectiles, configured in model and series designated as PGU-13, PGU-14, and PGU-15. Proper shipping name: Ammunition for cannon with explosive projectile.

3. TEST REPORTS. Rough Handling Test Report No. 43777-1, Wyle Laboratories, dated 5 Dec 77. ADTC/SD3T Test Report, dtd 11 Oct 78. AFALD/PTPD Test Report No. 79-12, dtd Jul 79. Vibration Test Report 44778-1, Wyle Laboratories, dtd 15 Sep 79. Radiation Measurements Report, AFWL/DYV dtd 18 Sep 79. Radiation Survey Report, AFWL/DY, dtd 3 Jan 79. WHCC Drop Test Report, dtd 6 Mar 80.

4. SPECIAL PACKAGING REQUIREMENTS.

a. Validate container packing and marking procedures to TO 11A13-14-7. CNU-332/E will utilize interior dunnage consisting of cushion described in AF Dwg 785040 or empty linked tube carriers described in WHCC Dwg 5073K107-1.

b. Container will be marked with Certification Control No: AF-78-51.

c. Container CNU-309/E will be unitized to AF Dwg 785040, Rev B. Container CNU-332/E will be unitized to Wayne Colony Dwg 5073K107.1.

5. SPECIAL TRANSPORTATION REQUIREMENTS.

a. Department of Transportation Exemption DOT-E-8101 (second corrected copy), dated 13 June 80, is incorporated by reference and made a part of this certification.

b. A copy of DOT-E-8101 exemption must be carried aboard each motor vehicle or vessel used to transport authorized containers.

c. DOD Hazard Classification for GAU-8 30mm Ammunition, AFISC/SEV letter, dated 25 Jun 79, is incorporated by reference and made a part of this certification.

d. Shipping documents will be marked: Packaged IAW 173.7(a) of 49 CFR by authority of Certification Control No. AF-78-51.

e. Containers will be loaded, blocked and braced on transport equipment IAW AF Dwg AF796129 for motor vehicles and Army Dwg 19-48-7062-SP5M7 for railcars.

6. REPORTING REQUIREMENTS. Any change to containers affecting configuration on performance will be coordinated for approval by the certifying office. Any incident involving loss of contents of the containers must be reported to the certifying office and as required by DOT-E-8101 exemption.

7. ADTC Container Certification AF-78-51, dated 19 Nov 79, is cancelled by this reissued certification.

NEAL P. CROSSON
Project Engineer
AD/SD3E

DAVID R. VOLZ
Transportability Agent
AD/SD3P

FRED H. CARLEY
Chief, Packaging and Transportation Division
Munitions SPO

DATE OF CERTIFICATION: 13 June 1980

DEPARTMENT OF TRANSPORTATION
RESEARCH AND SPECIAL PROGRAMS ADMINISTRATION
WASHINGTON, D.C. 20590

DOT-E 8101
(SECOND CORRECTED COPY)

1. The U.S. Department of Defense, Washington, D.C., is hereby granted an exemption from those provisions of this Department's Hazardous Materials Regulations specified in paragraph 5 below to offer packages prescribed herein of a Class B explosive containing a low specific activity radioactive material in the same outside shipping container with a Class A explosive for transportation in commerce subject to the limitations and special requirements specified herein. This exemption authorizes the use of the EXPLOSIVES A placard only when 30mm GAU-8 (PGU-14/B) armor piercing ammunition, containing a depleted uranium metal projectile, is loaded in the same shipping container with PGU-13/B ammunition, which is Class A explosives, relieves the need to label and mark the packages as containing radioactive material, and provides no relief from any regulation other than as specifically stated.

2. BASIS. This exemption is based on The Department of Defense's application dated August 28, 1978, and supplemented by letters dated June 6, 1979, and June 4, 1980, submitted in accordance with 49 CFR 107.103 and the public proceeding thereon.

3. HAZARDOUS MATERIALS (Descriptor and Class). Ammunition for cannon with solid projectile, Class B explosive; Ammunition for cannon with explosive projectile, Class A explosive.

4. PROPER SHIPPING NAME (49 CFR 172.101). Ammunition for cannon with explosive projectile.

5. REGULATION AFFECTED. 49 CFR 173.87, 173.392(c)(7), 173.392(c)(8).

6. MODES OF TRANSPORTATION AUTHORIZED. Motor vehicle, rail freight, and cargo vessel.

7. SAFETY CONTROL MEASURES. Packaging prescribed is the USAF designated CNU-309/E and CNU-332/E, 30mm Ammunition Shipping and Storage Container, appropriate drawings thereof on file with the Office of Hazardous Materials Regulation (OHMR). Each shipping container used under this exemption must be approved in accordance with 49 CFR 173.7(a) by container certification AF-78-51.

8. SPECIAL PROVISIONS

a. A RADIOACTIVE placard is not required on shipping containers transported under this exemption nor are the packages required to be marked or labeled as containing radioactive materials.

b. Shipping documents must be marked: "Packaged IAW 173.7(a) of 49 CFR by authority of Certification Control No. AF-78-51", in addition to other information required by Subpart C of 49 CFR Part 172.

c. The control and loading of materials transported under this exemption shall be carried out with minimum delay and stowage shall be as far as practicable from crews quarters or other regularly occupied areas and in no case closer than 20 feet to these areas unless it can be demonstrated that the radiation dose rate in these areas does not exceed 0.75 millirem per hour.

d. A copy of this exemption must be carried aboard each motor vehicle or vessel used to transport packages covered by this exemption.

e. Persons who receive packages covered by this exemption may reship them pursuant to the provisions of 49 CFR 173.22a.

9. REPORTING REQUIREMENTS. Any incident involving loss of contents of the packages must be reported to the OHMR as soon as practicable.

10. EXPIRATION DATE. November 30, 1980.

Issued at Washington, D.C.:

J. R. Grothe for

13 JUN 1980
(DATE)

Alan I. Roberts
Associate Director for
Hazardous Materials Regulation
Materials Transportation Bureau

Address all inquiries to: Associate Director for Hazardous Materials Regulation, Materials Transportation Bureau, Research and Special Programs Administration, U.S. Department of Transportation, Washington, D.C. 20590. Attention: Exemptions Branch.

Dist: FHWA, FRA, USCG

DEPARTMENT OF TRANSPORTATION
RESEARCH AND SPECIAL PROGRAMS ADMINISTRATION
WASHINGTON, D.C. 20590

DOT-E 8101
(EXTENSION)

In accordance with 49 CFR 107.105 of the Department of Transportation (DOT) Hazardous Materials Regulations DOT-E 8101 is hereby extended by changing the expiration date in paragraph 10 from November 30, 1980 to August 31, 1982.

This extension applies only to party(s) listed below based on the application(s) received in accordance with 49 CFR 107.105. All other terms of the exemption remain unchanged. This extension forms part of the exemption and must be attached to it.

J. R. Grothe for

Alan I. Roberts
Associate Director for
Hazardous Materials Regulation
Materials Transportation Bureau

19 SEP 1980
(DATE)

Dist: FHWA, FRA, USCG

EXEMPTION HOLDER	APPLICATION DATE
US Department of Defense Washington, DC	June 4, 1980

The source material in cartridges will not be used in any processes. The cartridges will, however, be involved in certain physical operations. Discription of operation identifies the maximum number to cartridges involved , the hazard and the controls governing the operation. (The Radiological Protection Officer has the authority to suspend operations if, in his judgement, a hazard exists.)

2. Detailed discussion of operations involving cartridges is as follows:

a. Transportation - This installation will be involved in the transportation of the cartridges only with in the installation. Normal procedures for transporting ammunition will be followed. Local Standing Operating Procedures has been revised to address the specific requirments which must be satisfied when dealing with cartridges containing depleted uranium. All vehicles or aircraft (Military or Commercial) transporting radioactive materials will be monitored for radioactive contamination immediately after unloading. This will be done under the supervision of the installation RPO.

b. Storage - Cartridges will be stored in accordance with standard munitions storage practices. Specific requirements identified at Inclosure 3 of this supplement will also be met.

c. Inventory - Records of receipt, physical inventory, transfers and disposals will be rigidly maintained. These records will be maintained in the Directorate for Supply, PP&C Division, Stock Control activity. Normal inventory cycle (annual) will be followed. Film badges will be required by personnel engaged in receipt, shipping, inventory and inspection.

d. Inspection - A monthly health physics survey of all operations will be preformed by the Radiological Protection Officer. Static storage will be surveyed semi-annually. Other inspections to be performed by Quality Assurance personnel are as follows:

(1) Receiving Inspection (Initial Receipt) - Performed upon receipt of 30MM ammo from manufacturer, depot, or using organization. Two (2) out of each thirty-six (36) containers received will be inspected. The top two (2) layers in each container will be inspected, plus random radiological sample of external surfaces of containers.

(2) Annual Inspection (Periodic) - Will be performed as outlined in T011-1-10. Sample size will be determined using table 5-2 T011A13-14-7. The Inspection will consist of visual inspection for defects listed in Table 5-1 T011A13-14-7.

(3) Pre-Issue Inspection - Will consist of a minimum ten precent (10%) of each lot for each issue transaction. Items will be inspected for defects listed in table 5-1 T011A13-14-7. Only the top layer in each container will be inspected. Any defect is cause for rejection.

(4) Returned Munitions Inspection - Munitions returned from using activities will be visually inspected for defects. Inspection of munitions issued but not used (seals intact) will consist of a visually inspection of external configuration IAW Table 5-1 defects for containers. Munitions installed or loaded will be usually inspected for defects in table 5-1. Special attention will be given those rounds cycled thru the gun system.

(5) Magazine Inspection - Will be conducted Semi-annually to assure that the cartridges are stored accordingly to proper storage procedures. The igloo will be visually inspected, inside and outside, and at least once per year the lightning protection system will be tested.

(6) Safety in Storage Inspection - Will be conducted on unserviceable stocks in the igloos to assure that such stocks are segregated from serviceable stocks. Demil/Disposition authority will be requested as soon as possible.

e. Demilitarization - Past experience with similar caliber rounds indicates that the projectile can be separated from the cartridge case without danger of fire. Although the risk of fire is very remote, operations will be limited to the minmum number of cartridges required for a safe and efficient operation. Dosimetry and monitoring equipment will be readily available to assure safe radiation levels are maintained. Waste material generated by the demilitarization operation will be disposed of in accordance with AR 385-11 and TM 3-261.

DESCRIPTION OF OPERATIONS

OPERATION	MAX AMT OF CARTRIDGES PER OPERATION	HAZARD	CONTROL
Transportation a) Receipt b) On Post c) Chipment	52, 000 52, 000 52, 000	No internal/external radiation hazard. Slight internal hazard if punctured.	Compliance with Title 49 CFR. Normal explosive safety practice, e.g. selection and training of drivers and handlers. Radiation monitoring of unusual situations.
Storage	245,000 ctgs. per igloo	No internal/external hazard except in the event of a fire or explosion.	Normal explosive safety procedures to minimize risk. Igloos are designed to prevent sympathetic detonation. Combustible material will be kept at a minimum to minimize fire hazards.
Inventory	245,000 ctgs. per igloo	No internal/external hazard.	Limited to count of exterior containers.
Inspection	1176 ctgs. per operating bay. 3500 ctgs. per holding bay	No internal/external hazard.	Design of munitions and regular radiation surveys will preclude any problem due to aging. Personnel will use normal protective clothing, i.e., coveralls and gloves.
Demilitarization	20,000 ctgs. per bldg.	Low internal/external hazard.	Local ventilation systems of the type described in block 11(c) will be used to prevent possible airborne contamination.

2A

Storage Requirements: The following general requirements are for storage of 30MM ammunition.

a. Packing material, empty boxes, tools, handling equipment, or any miscellaneous material shall not be stored in a magazine containing explosives.

b. Paints, oils, and other flammable materials shall not be stored in a magazine containing explosives.

c. 30MM ammunition shall be stored and stacked accoring to type, lot number, quantity-distance requirements, and compatibility group.

d. Containers of different lots shall be stacked separately, and the separation between lots clearly defined.

e. Stacks shall be arranged to permit free circulation of air.

f. Dunnage shall be constructed and arranged so that stacks will not lean, fall, sag, or shift.

g. Sealed containers shall not be opened except for issue or inspection.

h. Incomplete packages shall be securely closed and marked to identify contents and quantity. Only one lite box will be permitted for each lot and condition code per storage structure and shall be stored on the top and fromt of the stack.

Inside Storage: Perferred storage is in earth covered magazines.

a. Dunnage shall provide a minimum clearance of 2 inches from the floor.

b. Heat shall not be provided by stoves or open fires.

Table 5–1. Classification of Visual Defects Chart

COMPONENT	CHECKPOINT	DEFECT CLASSIFICATION	CORRECTIVE ACTION
Shipping and Storage Container M548	Heavy corrosion.	Major	Reject, clean, paint or replace.
	Markings incorrect, missing or obliterated.	Major	Compare contents with another container. Restore markings as required. Obtain information from records or like items in stock.
	Broken latches.	Major	Reject, replace with top from like item, if possible.
	Large dents, holes, or buckled.	Major	Reject.
	Gasket damaged/inadequate or insufficient pressure (caused by deep groove from lip of container)	Major	Remove damaged gasket. Clean gasket groove thoroughly, rotate gasket 180°. Press gasket firmly into retainer. If gasket is not reusable, replace.
	Lead seal missing or improperly positioned.	Major	If seal is missing, verify quantity and re-inspect rounds. Report all shortages/ damages to applicable authority. Replace/reposition seal as required.
	Inadequate packing material.	Minor	Fill as required.
	Burrs or sharp edges on metal containers.	Minor	Remove sharp edges or burrs with abrasive or fine cut file. Touchup exposed metal with primer and paint as required.
	Inadequate paint coverage.	Minor	Clean surface as required with abrasive. Prime and paint. Restore markings as required.
DELETED			
Cartridge, 30MM, HEI, PGU–13/B	Fuze missing, damaged, or loose (Surface scratches are acceptable)	Major	Reject.

Table 5–1. Classification of Visual Defects Chart (Cont)

COMPONENT	CHECKPOINT	DEFECT CLASSIFICATION	CORRECTIVE ACTION
Cartridge, 30MM (Except Dummy, PGU–16/A)	Suspended lots.	Critical	Reject.
	Heavy corrosion or rust.	Major	Reject.
	Cracks in cartridge case.	Major	Reject.
	Dents greater than 1/16-inch in depth or 1/4-inch in length anywhere on cartridge case body.	Major	Reject.
	Primer loose or protrudes.	Major	Reject.
	Primer exhibits evidence of firing pin impact.	Major	Reject.
	Nicked, dented or damaged extractor groove.	Major	Reject.
	Projectile not properly aligned (tipped) in cartridge.	Major	Reject.
	Loose projectile or partial crimp.	Major	Reject.
	Plastic rotating band(s) loose or missing.	Major	Reject.
	Plastic rotating band(s) cut or gouged.	Major	Reject.
	Lot number missing or illegible on cartridge case.	Minor	Restore.
	Lot number faded or partially obliterated.	Minor	Remove by wiping with a soft, dry cloth. Do not polish.
	Foreign matter on cartridge case.	Minor	Restore markings using like item.
	Markings other than lot number missing or illegible on cartridge case.	Major	Reject.
*Cartridge, 30MM, Dummy, PGU–16/A	Aluminum nose loose.	Major	Reject.
	Projectile loose.	Major	Any protrusion is cause for rejection.
	Using a straightedge check that projectile retainer bolt is flush with or slightly below base of cartridge.		

*Applicable to rounds to be loaded in gun system.

Table 5–1. Classification of Visual Defects (Continued)

COMPONENT	CHECKPOINT	DEFECT CLASSIFICATION	CORRECTIVE ACTION
*Cartridge, 30MM, Dummy, PGU–16/A (Cont)	Cracks in cartridge case.	Major	Reject.
	Dents greater than 1/16-inch in depth or 1/4-inch in length anywhere on cartridge case body.	Major	Reject.
	Nicked, dented or damaged extractor groove.	Major	Reject.
	Projectile not properly aligned (tipped) in cartridge.	Major	Reject.
	Loose projectile or partial crimp, as applicable (Earlier production rounds are not crimped).	Major	Reject.
Shipping and Storage Container, CNU–309/E	Markings incorrect, missing, or obliterated.	Major	Compare contents with another container. Restore markings as required. Obtain information from records or like item.
	Broken or missing latches.	Major	Reject. Replace or repair as necessary to restore function.
	Angle iron guides broken or bent.	Major	Reject. Straighten, weld, or replace as necessary.
	Damaged, loose, missing gasket.	Major	Reject. Repair or replace as necessary.
	Cover warped or bent to prevent proper seal.	Major	Reject. Replace with like item.
	Lead seal missing or improperly positioned and banding material is missing, broken, or shows signs of tampering.	Major	Verify quantity and reinspect rounds. Report all shortages/ damage to applicable authority. Replace/reposition seal as required.
	Missing or broken tie down rings.	Minor	Repair or replace as necessary.
	Damaged or missing drain plug.	Minor	Replace with like item.
	Damaged fork slots.	Minor	Straighten and weld as required.

*Applicable to rounds to be loaded in gun system.

Table 5–1. Classification of Visual Defects (Continued)

COMPONENT	CHECKPOINT	DEFECT CLASSIFICATION	CORRECTIVE ACTION
Shipping and Storage Container, CNU–309/E (Cont)	Missing or broken pins.	Minor	Replace with like item or suitable substitute.
Link tube carrier	Alignment of fabric loops on tubes.	Major	Realign.
	Linked tube carriers broken, split, cracked, or otherwise damaged.	Major	Reject. Replace with like item.
	Fabric loops missing or broken.	Major	Reject. Replace with like item.
	Projectile windscreen missing.	Critical	Reject. Notify appropriate personnel.
Cartridge, 30MM, APIT, PGU–14/B or API PGU–14A/B and PGU–14B/B	Projectile windscreen loose. Windscreen rotates or lateral movement at centerline of cartridge felt at tip of windscreen.	Major	Accept windscreens that turn under pressure when held between thumb and first finger only but does not have discernible lateral movement at tip of windscreen without applying pressure. Reject those windscreens that have lateral movement.

CHAPTER 3

SENECA ARMY DEPOT
ROMULUS, NY 14541

RADIOLOGICAL PERSONNEL TRAINING AND EXPERIENCE RESUME

NAME: Thomas J. Stincic

1. Type Training:

a. Principles and Practices of Radiation Protection.

b. Radioactivity Measurement Standardization, Monitoring Techniques and Instruments.

c. Mathmatics and Calculations Basis to the Use and Measurements of Radioactivity.

d. Biological Effects of Radiation.

TYPE	WHERE TRAINED	DURATION	OJT	FORMAL
A,B,C,D	DARCOM Ammunition School	2 weeks 1-12 Aug 77	Yes	Yes
A,B	DARCOM Ammunition School	2 days 16-17 Feb 78	No	Yes
A,B,C,D	Oak Ridge Associated Universities	1 week 23-27 Jan 78	Yes	Yes
A	Defense Nuclear Agency/ DOE Nevada Test Site NUWAX-79	3 days 18-20 Apr 79	Yes	NO
A,B,C,D	Kirkland, AFB NETEX	1 week 16-20 July 79	Yes	Yes
A,B,C,D	Eberline Corp Santa Fe, NM	1 week 7-11 Apr 80	No	Yes

2. Experience:

ACTIVITY	SITE	DURATION	RESPONSIBILITY
SW Munitions Storage	Seneca	2 Years	Alpha Team Chief

B. Richard Roane - Alternate RPO - BS, Electrical Engineering, 1962 and Masters Degree, Electrical Engineering, 1964 from Auburn University, Alabama.

TYPE OR TRNG	SITE	DURATION	OJT	FORMAL
1) Liquid Scintillation & Gas Proportional Counters	New Cumberland Army Depot, New Cumberland PA	1 week		Yes
2) Nuclear Weapons Maint. Officer	Sandia Base New Mexico	8 weeks		Yes
3) Nuclear Emergency Team Operations	Sandia Base New Mexico	3 weeks		Yes

EXPERIENCE:

ACTIVITY	SITE	DURATION	RESPONSIBILITY
Chief, Depot Alpha Tesm	Seneca Army Depot	5 years	Monitor Special Weapons Operations

CHAPTER 4

1. The source material cartridges will be stored in typical depot igloo-type magazines. The igloo structure, designed for the storage of high explosives, includes 16 inches of concrete at the base of the wall, tapering to 6 inches of concrete at the tip of the arch. The exterior of the igloo is covered with a minumum of 2 feet of earth cover. The physical positioning of igloos within a block is designed to prevent the propagation of an explosion from one igloo to another. The exterior of each storage site will be posted with a signs bearing the radiation symbol and the words CAUTION - RADIATION AREA, CAUTION RADIACTIVE MATERIAL.

2. The following equipment will be used for monitoring and other radiation detection procedures.

a. AN/PDR 27 (7 ea): This is a portable, battery powered Beta/Gamma detector. It will detect and measure gamma up to 500 milliroentgens and detects beta. The radiac detector consists of two cylinders bolted together as one unit. The cylinder contains a type JAN -5979 Geiger-Muller tybe and a type JAN-5980 Geiger Muller tube. The longer tube is provided with a removeable beta shield. When the shield is removed a 0.0005 inch thick mica window is exposes.

b. AN/PDR-54 (PAC-3GN) (7 ea): This is portable, battery operated alpha detecting and measuring device. The detecting element is a gas flow proportional type probe with a 61 square centimeter active area. The gas used in propane and the probe covering is aluminum plated mular approximately 0.00025 inch thick. The instrument reads from 0 - 100,000 CPM in three scales. By masking part of the probe face, higher readings are possible.

c. High volume air samplers (3 ea): Type of samplers are Staplex TF1A-27. Two of the samplers are 110V, the other is a DC Battery Operated type.

d. Standard Army Film Badges are available on a one per individual basis.

e. Gas Proportional Lab Scaler/Counter (2 ea): Type in Nuclear Measurement Corporation Gas Proportional Counter Model PC-5, which is an ionization chamber type device in which radiation is detected by the ionization of specially selected gases by collision with radiation particles or reaction with high energy electromagmetoc rays (X-rays or gamma rays).

CHAPTER 5

Equipment calibration criteria are as follows:

a. AN/PDR-27. Calibrated on a 90 day cycle, against an M3A1 Radioactive source set, Cobalt 60 source, covered by BML 19-1826-02, Edgewood Arsenal. Calibration will be performed by Army Calibration or Quality Assurance personnel.

b. AN/PDR-54. Calibrated on a 90 day cycle, against an AN-UDM-6 radio Calibration performed at Seneca Army Depot by qualified personnel from the Quality Assurance Directorate. Calibration (DU-23a) Department of the Army License No.954.

NOTE: a & b will be calibrated at 2 points on the scale. Potentiometers will be adjusted as a normal practice to bring readings within 15% of a truce level (20% will be maximum).

c. High volume air samplers. No calibration required.

d. Film badges are furnished by Lexington Blue Grass Army Depot.

e. Gas Proportional Lab Counter/Scaler. Calibrated prior to each days use. The Nuclear Measurements Corporation PC-5 Proportional Counter systems are calibrated with a U238 source. The certified PC-5 reading of the isotope standard is repeatable when the system is in calibration. Should isotopic standardization not be repeatable at any time, repair is indicated and will be performed.

CHAPTER 6

1. The proposed procedures to protect health and minimize danger to life and property, by operation, are as follows:

a. Transportation - Transportation within the installation will be kept to a minimum. Drivers carrying source material cartridges will be instructed to use extreme caution and will be advised of the procedure to follow in the event of an accident/incident. Procedure will include immediate notification of appropriate personnel, e.g. firefighters, RPO, security and QA personnel. In addition, drivers will be instructed to keep unauthorized personnel out of the immediate area of the accident. Because, under normal condition, there is little or no radiation hazard involved, concern is primarily with normal explosive hazards. Personnel involved in the operation will have to meet the criteria established for ammunition handlers. Other transportation considerations are:

(1) Issue - All shipments of source material cartridges will be made in full compliance with Title 10 CFR and applicable Dept. of Transportation requirements.

(2) Receipt - Upon receipt of carrier, personnel will make a visual check to determine whether or not there are any broken, improperly applied, or missing seals. If seals are improperly applied or not intact, carrier will be moved to the suspect carrier point and thoroughly inspected by Quality Assurance personnel to assure that the material has not been tampered with before proceeding with the offloading. QA personnel will perform a random wipe test on receipts. If a reading in excess of those allowed by Table 4-1, Radioactive Contamination Guide AR 700-64, the decontamination procedures outlined in Appendix G of SEAD regulation 385-1 will be enforced by the RPO.

b. Storage - Storage crews will be provided with normal protective equipment associated with industrial operations. Experience with similar types of small caliber ammunition (w/o DU) has shown that there is little or no hazard involved. Credible hazards that do exist are fire and explosion. Supervising personnel will be thoroughly familiar with action to take, according to established procedures, in the event of an incident. To minimize fire hazard, the cartridges will be stored in earth covered igloos which are designed to self-seal in case of fire. All combustible material except for packing material will be removed from igloos. Quanity distance limits will be used to prevent sympathetic detonation of the source material cartridges by an external detonation. Quantity distance criteria also insures protection to personnel and property against the explosion of ammunition.

c. Demilitarization - Experience with similar caliber rounds indicates there is relatively little risk involved in the demilitarization of this item. During demil operations; the projectile is separated from the cartridge case and the DU penetrator remains encapsulated in its aluminum windscreen. The encapsulated pentrators will be shipped to a licensed recipient for recovery or disposal.

d. Waste - Quantities of waste material cannot be projected in advance of operations. Radioactive waste products will be disposed of in accordance with AR 385-11 and TM 3-261. There will be no sale to the general public. If source material recovery is directed, source material will only be shipped to an NRC licensed recipient.

2. Bioassay services are available from the U.S. Army Environmental Hygiene Agency.

CHAPTER 7

Emergency procedures.

a. Security - Source material cartridges will be stored in a limited access area which is covered by 24 hour security patrols. Access to storage locations will be limited to only a few selected individuals. Theft of any source material cartridges will be reported in accordance with Part 20, Title 10 CFR.

b. Firefighting - In the event operating personnel are present during incipient stage of a fire, they will make an attempt to extinguish it. If control of the fire is not possible, personnel will evacuate the area and notify firefighters immediately. Personnel will evacuate to a point 2,000 feet upwind of the fire. Firefighting personnel will wear self-contained breathing apparatus and will use Metal X extinguishing apparatus to fight the fire. Effluents will be monitored to determine if additional immediate actions are required. Incident site will remain controlled until released by D/QA, Safety and RPO for normal use.

c. Explosion - In the event of an explosion involving source material (DU) cartridges, the area will be cordoned off and access will be limited to emergency personnel. Directorate for Quality Assurance, Safety and Directorate for Supply, Ammunition Division personnel will ascertain extent of damage and, if possible, isolate ammunition subjected to the explosion. A radiological survey of the explosion site will be conducted by the RPO with assistance from the depot Alpha team. If the levels of contamination exceed those established in Table 4-1 of AR 700-64, decontamination procedures as outlined in SEAD Regulation 385-1 and TM 3-220 will be enforced. If maximun permissible concentrations are not exceeded, QA and Ammunition Division personnel or explosive ordance personnel will enter the area and remove those cartridges subjected to the explosion and place them in segregated storage. Immediate disposal instructions will be requested from higher headquarters.

d. Monitoring - In the event of a fire or explosion air samples and water run off samples will be taken at a distance of 2,000 feet. If air and water samples reveal a radioactive concentration in excess of 5,000 times the MPC (air - 3 X 10 - 12 or water - 4 X 10 - 5) the NRC will be notified immediately. If samples contain a radioactive concentration in excess of 500 times the MPC, the NRC will be notified within 24 hours of the incident.

TABLE -1
RADIOACTIVE CONTAMINATION GUIDES

Contaminated Items and Indications for Actions	Fixed or Removable	Contamination Level: Alpha Fixed Dpm per 100 cm2	Alpha Removed Dpm per 100 cm2	Beta-gamma 1/ mrad/hr @ 1 In.	Beta-gamma 1/ Dpm per 100 cm2	Method of Measurement
1. Clothing, including shoes:						
a. Personal. Should be replaced, decontaminated or stored for decay if above:	F	200		0.2		Probe
	R		None		None	Smear**
b. Anticontamination.						
(1) General. Should be replaced and/or decontaminated if above:	F	1000		0.2 ~~0.5~~		Probe
	R		200		1000	Smear**
(2) Laundry. Should not be released to public laundry if above:	F	200		0.2 ~~0.4~~		Probe
	R		50		200	Smear**
(3) Respirators. Should be decontaminated after use if above:	F	200		0.2 ~~1.0*~~		Probe
	R		None		None	Smear**
2. Containers. Prior to nonradioactive use, should be decontaminated if above:	F	200		0.3		Probe
	R		None		100	Smear**
3. Laboratories and Work Areas:						
a. Uncontrolled Area. Require controls and posting or decontamination if above:	F	200		0.20		Probe
	R		20		100	Smear**
b. Controlled Areas:						
(1) Hoods:	F	1000		2.0		Probe
	R		200		2000	Smear**
(2) Glove Boxes:	F	5000		2.5		Probe
	R		1000		5000	Smear**
(3) Workbench Surface:	F	1000		0.5		Probe
	R		200		400	Smear**
4. Skin:						
a. Body. Continue decontamination if above:	F	200		0.06		Probe
	R		None		None	Smear**
b. Hands. Continue decontamination if above:	F	400		0.06 ~~0.3~~		Probe
	R		None		None	Smear**
5. Equipment*** ~~Vehicles~~:						
a. Used in controlled area. Should be decontaminated above:	F	5000 ~~[illegible]***~~	1000	2.0***	10,000	Probe
	R		~~2230***~~	0.2	~~22,000***~~	Smear**
b. Used in noncontrolled area. Should be decontaminated above:	F	~~***~~	100	~~0.5***~~	1,000	Probe
	R	500	~~220***~~		~~2,200***~~	Smear**

1/ Measured through not more than 7 milligrams per square centimeter of total absorber and average not more than one square meter.

F Fixed
R Removable
* In contact with any outside surface of the mask.
** Smears analyzed with a calibrated counting system.
*** ~~Based on Title 49, CFR, Part 173.397 or Graziano's Tariff.~~
Uranium natural, Uranium depleted, Uranium 238, levels for Alpha contamination should be increased by a factor of ten.

Incl 1 to Suppl 7

CHAPTER 8

Extracts from Standard Operation Procedure (SDSSE-RA-600-18) Shipping & Receiving Inspection

Page 5/33 - 13 -(S) All incoming DU loaded vehicles must be monitored for radioactive contamination within 3 hours if vehicle arrives during duty hours, and within 18 hours if vehicle arrives during non-duty hours.

Page 6/33 - 5a -(S) Film badge will be worn by the inspector during monitoring and inspection of the vehicle.

6b -(S) In the event that the radiation level exceeds 0.5 mr/hr at the three foot distance, the truck will be moved to the suspect vehicle inspection station. The C, ASD (Ext 304 or 552) and RPO (Ext 261) will be immediately notified by telephone.

7c -(S) Trucks fueled with LP Gas shall not be used to transport ammunition and explosives within the ammunition area.

Page 7/33 - 9c -(S) In the event the radiation level exceeds 10 mr/hr on the container surface, the trailer will be closed and moved to the suspect vehicle inspection station. The C, ASD (Ext 304/552) and the RPO (Ext 261) will be immediately notified by telephone.

9d -(S) (O) In the event visual inspection reveals containers damaged to the extent ammunition or explosives are exposed, the load will be monitored using an AN/PDR 54. If the radiation level exceeds 500 cpm, the trailer will be closed and moved to the suspect vehicle inspection station. The C, ASD (Ext 304/552) and RPO (Ext 261) will be immediately notified.

Page 8/33 - 11a -(O) Prepare three envelopes to contain the swipe samples. List on each envelope, the name of the carrier (Whitten, etc), carrier's trailer number, and the date. Number the envelopes one thru three.

11b -(O) Prepare three self-adhesive labels with the same information as above. Number the labels one thru three.

11c -(O) Obtain three filter paper circles.

11d -(O) Select three containers for monitoring, one forward, one at the middle, and one at the rear of the load.

11e -(O) At the first container, place the label marked "Number 1" on the top of the container. With the filter paper circle, rub the top and sides of the container (100 sq cm rubbed area), place the rubbed circle into the envelope marked "Number 1" and tuck envelope flap in.

Page 8/33 -11f -(O) Repeat the above process for container number 2.

11g -(O) Repeat the above process for container number 3.

Page 9/33 -11h -(O) As required, use the above process and take additional swipes of containers which exhibit higher radioactivity than other containers in the load. Number those samples 4,5, ect. as required.

13b -(O)Envelopes with swipe samples will be delivered to the Calibration Lab (Bldg 321) for analysis.

14/4-If an explosion or incident occurs, the operation will cease immediately, and the RPO (Ext 261), Dir/QA (Ext 252) and the C, ASD (Ext 304) will be notified. If emergency equipment (Firetruck or ambulance) is needed, dial 117. The operation will resume only upon the direction of the RPO.

Page 10/33-14-5-The RPO or shipping inspector has the authority to suspend operations if in his or her judgement, a hazard exists.

14-6-If a container of DU ammunition is dropped, the operation will be stopped, the RPO (Ext 261) and C, ASD (Ext 304) will be notified. Prior to the start of operation, the RPO will assure area has been monitored for radiation level.

14-8-Two number 2 fire symbols and two radiation caution symbols will be posted on all vehicles transporting DU materiel not destined for off depot movement.

14-17-The RPO or his designated representative will monitor empty vehicle for radioactive contamination prior to vehicle release from depot.

Page 14/33-1b - (S) During spotchecks, shipping inspector will assure that RPO or his representative is present monitoring the operation and area for excess radiation.

Page 17/33-6x - All vehicles loaded with explosives or ammunition will exit thru Post 2 only.

Page 21/33- 9 - Perform a swipe test of the load.
a. Six swipes per railcar
b. Three swipes per conex container

Page 23/33- 11- When a suspect car is being processed, security personnel will be posted to monitor Conrail traffic and stop operations when trains are in the vicinity.

12 -C, ASD will notify Provost Marshal and Transportation of discrepancies involving sensitive items.

13 -When opening or inspecting suspect railcars, not more than two qualified personnel shall be permitted at the site.

Special Safety Requirements for Handling Depleted Uranium Ammo

1. In the event of an accident or incident involving (DU) Ammunition occurs, the operation will cease immediately and the RPO (Ext 261), Ammo C, (Ext 422) D/Supply (Ext 308/203), will be notified. If emergency equipment is required (Fire Truck and Ambulance) dial 117. The operation will resume only upon the direction of the RPO.

2. Personnel to be briefed by RPO and or supervisor about the characteristics and special handling requirements of depleted uranium (DU) ammunition prior to start of operation.

3. If container of DU Ammunition is dropped, operations will be stopped and D/Supply, RPO and C/ASD notified. Prior to start of operation again, suspect container will be monitored for radiation level. If dropped in excess of 30 feet, package must be segregated, tagged and contents reported as unserviceable for disposition.

4. The radiation caution symbols will be posted at each work site in addition to the appropriate fire sysmbol, when ammunition containing depleted uranium (DU) is involved.

5. When an incoming shipment is identified as containing DU munitions, the carrier will be monitored with appropriate radiation detection instruments to determine if radioactive contamination level identified in AR 700-64 exist.

6. The Radiological Protection Orricer has the authority to suspend operation, if in his judgement, a hazard exist.

7. Film badges will be worn by operating personnel when (DU) ammunition is being received or being outloaded for shipment from storage location.

8. When carriers loaded with senistive or pilferable type ammunition items are left unattended and awaiting outshipment or unloading, the Provost Marshal's Office will be furnished the following information:

a. Location of carrier.
b. Serial No. or license plate number of carrier as appropriate
c. Commodity in carrier
d. Serial Number of seals on the carrier

CHAPTER 9

RADIOLOGICAL PROTECTION

1. Purpose. The purpose of this program is to establish procedures to ensure the safety of individuals involved in the handling and storage of radioactive material and other equipment that produce ionizing radiation.

2. Scope. This chapter is applicable specifically to the Medical Officer, Radiological Protection Officer (RPO), Director of Special Weapons, Director of Supply, Radiological Control Committee, and to any depot element involved in the handling and storage of radioactive material.

3. Policy. Seneca Army Depot will provide a safe, healthful environment for all personnel working with or handling radioactive material. All provisions of Department of the Army regulations, Department of Transportation, and Nuclear Regulatory Commission rules will be followed.

4. Definitions. a. Radiological Protection Officer (RPO): An [illegible]al appointed by the Commander to provide overall supervision of the [illegible]al Protection Program and to provide consultation and advice on the [illegible] hazards associated with ionizing radiation and the effectiveness [illegible] measures to control these hazards. He must be technically qualified by virtue of education, training and/or experience to assure a capability commensurate with the assignment.

b. Radiation Control Committee (RCC):

(1) A group of persons appointed by the Commander to advise him on policy and actions necessary to ensure safety of personnel and property from hazards of radiation.

(2) The committee will consist of the Commander or his designated representative, the Radological Protection Officer, Medical Officer, the Safety Manager, and other persons who are knowledgeable in the safe use of radiation, as are deemed necessary.

(3) The committee membership will be kept up-to-date. Training and experience resumes for each member of the committee will be kept on file by the Radiological Protection Officer. In those cases where the committee membership list and resumes are on file at the Nuclear Regulatory Commission (NRC), the NRC will be advised of membership changes by letter forwarded through the Commanding General, DARCOM, ATTN: DARCOM-SF.

c. Ionizing Radiation: Electromagnetic or particulate radiation capable of producing ions directly or indirectly in its passage through matter. Alpha and beta particles, gamma rays, x-rays and neutrons are examples of ionizing radiation.

d. Controlled Area: A defined area in which the exposure of personnel to ionizing radiation is under the supervision of an individual in charge of radiation protection.

e. Occupationally exposed individual: An individual whose work is performed in a controlled area and whose duties might involve exposure to ionizing radiation.

f. User: An individual assigned to an activity, section, division, or other organizational unit which has been delegated the responsibility for the use, operation, or storage of radiation sources.

5. Responsibilities. a. Radiological Protection Officer (RPO) is responsible for the following:

(1) All aspects of radiation protection in the storage, handling, reporting, disposition, and shipment of radioactive material.

(2) Inspection and monitoring as necessary to ensure that persons working with radioactive materials are complying with the designated safety measures and are not working under unsafe conditions.

(3) Investigation of radiation incidents.

(4) Guidance as to the types of protective clothing and equipment needed and when they are to be used.

(5) Instruction of personnel working in the storage area and/or handling the radioactive material.

(6) Familiarity with applicable regulations.

(7) Preparation of reports of overexposure and radiological incidents. A written report to the Nucleonics Branch, Lexington Army Depot, will be submitted within 24 hours following incident and to DRCSF-P (DARCOM-R 385-25).

(8) Ensuring that no individual under nineteen (19) years of age shall be occupationally exposed to ionizing radiation in excess of that allowed to any individual in the population at large (1.25 rem/calendar quarter or 3 rem/year).

(9) Keeping Commander and other SEAD organizations informed of any incident that occurs locally.

(10) Designating storage areas for personnel monitoring devices when not being worn.

(11) Maintaining this regulation current in accordance with SEAD Suppl 1 to AR 310-2, and maintaining records in accordance with AMCR 385-25, para 6c(2)(e), and para 33.

b. Radiation Control Committee is responsible for:

(1) Recommending to the Commander policies on the safe use, handling, storage, transport, receipts, shipment and disposal of sources of radiation.

(2) Reviewing the radiation safety aspects of proposals for the procurement and use of sources of radiation; the modification of existing radiological operations and operating procedures, and providing recommendations to the Commander for appropriate actions.

(3) Reviewing application(s) for Nuclear Regulatory Commission (NRC) licenses or Department of the Army authorization.

(4) Reviewing and approving the qualifications of users of radiation.

(5) Reviewing reports of radioactive incidents and accidents to determine the cause and recommending appropriate actions for the Commander.

c. Medical Officer is responsible for:

(1) The preparation and maintenance of exposure records, DD Form 1141, as outlined in para 6b(3) below.

(2) Rendering physical examinations to individuals as required by AMCR 385-25, para 13 and 14.

(3) The establishment and training of an emergency medical team in support of and as outlined in the Depot's NAIC Plan.

d. Nuclear Accident/Incident Control Officer is responsible for the establishment and training of the Installation Nuclear Accident/Incident Control Team.

e. The Safety Manager/Radiological Protection Officer is responsible for the monitorship of this program as a part of his normal inspection processes.

f. Supervisors of operations involving radioactive material are responsible for:

(1) Knowing the exact location of all sources of radiation for which they are responsible.

(2) Assuring that their personnel have received adequate instruction and/or experience prior to using or being exposed to radiation.

(3) Controlling contamination.

(4) Preparing, prior to the start of any operation involving radioactive material or possible exposure to radiation, an adequate SOP for review by the RPO prior to final approval in accordance with para 16-21, DARCOM-R 385-100. The SOP will contain, as a minimum, responsibilities, maximum permissible levels of radiation in the areas concerned, storage of sources, procedure regarding dosimetry, decontamination, and emergencies. (This SOP is mandatory for operations in which there is a reasonable probability of exposure beyond established limits.)

(5) Enforcing SOPs, rules, and special precautions.

g. Calibration Section, Maintenance Division, D/SW, is responsible for:

(1) Ordering required number of film badges to fill requests of all depot elements.

(2) Receiving exposed film badges from depot elements and forwarding to Lexington Army Depot for processing.

(3) Preparing DA Form 3484 (Photo Dosimetry Report).

(4) Forwarding the results of exposure to the Medical Officer for posting to individual's DD Form 1141 with a copy to RPO.

h. Radiation workers will be responsible for:

(1) Knowing and following SOPs, rules and special instructions.

(2) Using safety equipment properly.

(3) Reporting to the supervisor any accident, unusual incident, personal injury (however slight), suspected overexposure and/or suspected internal exposure, as soon as possible after the occurrence.

i. Transportation Officer will be responsible for ensuring that copies of all documents dealing with shipment or receipt of any radioactive commodity are forwarded to the RPO immediately.

6. Procedures. a. Radiation protection standards adopted by DA and DLA for the control of occupational exposures to ionizing radiation include:

(1) The accumulated dose equivalent of radiation to the whole-body, head and trunk, active blood-forming organs, gonads, or lens of the eye will not exceed:

(a) 1.25 rem in any calendar quarter, nor

(b) 5 rem in any 1 calendar year.

NOTE: During the entire gestation period, the maximum dose equivalent to the embryo/fetus from occupational exposure of the expectant mother should not exceed 0.5 rem. When exposure is limited to radiation of low pentrating power, the above recommended limit to the embryo/fetus may be attained if the annual maternal dose equivalent is less than 3 rem acquired at a uniform rate.

(2) The accumulated dose equivalent of radiation to the skin of the whole-body (other than hands), forearms, cornea of the eye, thyroid, and bone will not exceed:

(a) 7.50 rem in any calendar quarter, nor

(b) 30 rem in any 1 calendar year.

(3) The accumulated dose equivalent of radiation to the hands and wrists or the feet and ankles will not exceed:

(a) 18.75 rem in any calendar quarter, nor

(b) 75 rem in any calendar year.

(4) The accumulated dose equivalent of radiation to organs including tissues, and organ system will not exceed:

(a) 5 rem in any calendar quarter, nor

(b) 15 rem in any 1 calendar year.

(5) Individual(s) entering a controlled area, but who are not classified as radiation worker (i.e., those under 18 years of age (29 CFR 570.57), and occasionally exposed individual(s) will not be exposed to a whole-body dose equivalent of more than:

(a) 2 millirem in any 1 hours, nor

(b) 100 millirem in any 7 consecutive days, nor

(c) 500 millirem in any 1 calendar year, nor

(d) More than 10 percent of the values in paragraph 5a(2), (3), and (4) above for other areas of the body.

(6) Individuals over 18 years of age, but who have not yet reached their 19th birthday, may be occupationally exposed to ionizing radiation provided that they do not exceed 1.25 rem dose equivalent to the whole-body in any calendar quarters, nor should they exceed 3 rem in the 12 consecutive months prior to their 19th birthday.

b. Personnel Dosimetry.

(1) An appropriate personnel monitoring device shall be used to measure the exposure of each individual who is likely to receive an accumulated dose of radiation in excess of 10% of the applicable quarterly basic Radiation Protection Standard. Each person occupationally exposed to ionizing radiation shall wear a film badge.

(2) The Calibration Section, Maintenance Division, D/SW, is designated as the central control point for film badges. (See Appendix K for handling and control of film badges.)

(3) Recording Procedures. The custodian of the medical records shall prepare and maintain DD Form 1141 for each person occupationally exposed to ionizing radiation. All exposure entries shall be made in rem.

(a) Initial determination of accumulated dose. In the initial preparation of a DD Form 1141, reasonable efforts should be made to obtain complete reports of all previous exposure based on recorded personnel dosimetry. DD Form 1952, Dosimetry Application and Record of Occupational Radiation Exposure, will be prepared for all individuals requiring DD Form 1141. For each period in which the individual was engaged in activities where occupational exposure to ionizing radiation was probable, and no record, or only an incomplete record, of his exposure during the period can be obtained, it shall be assumed that an occupation's exposure of 1.25 rem was incurred per quarter of each calendar year or fraction thereof. In cases where the nature of the radiation is unknown, it shall be assumed to be gamma radiation. If an individual was potentially exposed at more than one facility, the cumulative exposures shall be calculated and recorded in items 7 through 12 as appropriate. The sum of these whole-body exposures shall be entered in item 13, and a statement regarding the source of that information shall be entered in item 16, Remarks.

(b) Current record. Appropriate entries on each individual's DD Form 1141 shall be maintained to record exposures other than whole-body, with appropriate descriptions under Item 16, Remarks.

1. The DD Form 1141 is a permanent component of the individuals' medical record and shall not be used for other purposes. All previous copies of this form shall be retained in the individual's medical record. Commanders will authorize inspecting officials or supervisors of persons occupationally exposed to ionizing radiation and the individual concerned to review his form. If DD Form 1141 is maintained in the health records or civilian employee medical file, it will be withdrawn for review by the individuals indicated above. The entire health record or civilian employee medical file will not be made available for review by the individual indicated above.

2. When a civilian employee of the DA or DSA is not included in a Federal Civilian Employee's Health Service, a DD Form 1141 will be maintained as a permanent document in his SF 66, "Official Personnel Folder".

3. The DD Form 1141 shall be retained in the retired medical records of any member of the Armed Forces who has been occupationally exposed to ionizing radiation during his services. Disposition of DD Form 1141 for retired or separated civilian personnel will be made in accordance with governing civilian personnel directives.

4. If any member of the Armed Forces is released from active duty, or if a civilian employee terminated employment with a DOD agency, he may be furnished the appropriate information concerning his radiation exposure history.

(4) Control Procedures.

(a) The Radiological Protection Officer shall evaluate at intervals not to exceed a calendar quarter the DD Form 1141 of each individual engaged in duties involving occupational exposure to ionizing radiation. He shall establish procedures to inform and advise the Commander when action is necessary to limit an individual's exposure to ionizing radiation.

(b) When an individual has received a dose of ionizing radiation in an amount exceeding the radiation protection standards in paragraph 6, he shall be removed from duties involving occupational exposure to ionizing radiation until subsequent exposure limitations are established in consultation with competent medical authority. When an individual has received an accumulated dose of ionizing radiation in excess of 5 (M-18) rem, he shall be removed from duties involving occupational exposure to ionizing radiation until his exposure record has been evaluated by the Surgeon General of the military department concerned and subsequent exposure limitations are established as necessary.

7. General Safety Rules. This section outlines the general safety rules to be followed in the radiological safety program. The specific procedures outlined herein as appendixes may contain more stringent requirements. In case of conflict, the more stringent requirement will apply. The following rules are listed for personnel who are exposed to radiation.

a. Individuals will wear a film badge in a storage area containing radioactive material or while handling radioactive material or equipment producing ionizing radiation. In addition to the film badge, two pocket dosimeters or pocket chambers should be worn while in an area in which radiation exceeds a level of 5 millirems per hour.

NOTE: "Radiation Area" means any area, accessible to personnel, in which there exists radiation, originating in whole or in part within licensed material, at such levels that a major portion of the body could receive in any one hour dose in excess of 5 millirems, or in any five consecutive days a dose in excess of 100 millirems. Area will be marked in accordance with AR 385-30.

b. No individual will work alone in radioactive storage area in levels exceeding 20 millirem per hour.

c. Smoking, eating, drinking, or chewing tobacco or gum within the area is prohibited.

d. Good housekeeping will be maintained at all times.

e. Visitors will be escorted by qualified individuals assigned to the area.

f. Personnel working in the area will be responsible for monitoring themselves and any visitors.

g. Compliance with industrial safety standards should avoid accidents which are complicated by the presence of radioactive material.

h. Radiac meters and pocket dosimeters used for radiation protection purposes shall be calibrated at the intervals specified in the applicable publications.

i. Hands and other exposed parts of the body should be washed thoroughly after handling radioactive materials.

j. Do not place radioactive material (i.e., test samples) in the pocket.

k. Avoid abnormal exposure to radioactive material. Follow procedures carefully and always keep exposure time down to the barest minimum required for the operation.

l. In the event of emergency, notify the Radiological Protection Officer.

8. Inventory. a. An annual inventory will be conducted by users of all radioactive materials, and a copy of the inventory will be forwarded to the RPO. Inventory results will be prepared in accordance with the format depicted in Figure 9-1.

b. The RPO will conduct a physical inventory of radioactive materials at least every six months and retain a copy of this inventory in the appropriate file.

9. Leak Test. (Swipe Test) - This test will be performed by the user when required by regulation at time intervals specified in appropriate publications (TMs, TBs, ARs, DARCOM-Rs). A copy of leak test results will be forwarded to the RPO.

10. Disposal of Radioactive Waste, see Appendix A.

11. M3A1 Check Source, see Appendix B.

12. Radiac AN/UDM-6 (SOP Storage and Operation), see Appendix C.

13. Handling of Columbium Concentrates, see Appendix D.

14. X-Ray Procedure, see Appendix E.

15. Procedure for Decontamination, see Appendix F.

16. Nuclear Accident/Incident Control Plan, see Appendix G.

17. Radioactive Tubes and Self-Luminous Devices, see Appendix H.

18. Handling Conventional Ammunition Containing Depleted Uranium, see Appendix I.

19. Handling and Control of Film Badges, see Appendix J.

20. List of Available Radiation Survey Instruments, see Appendix K.

21. References.

a. AR 40-14.
b. AR 55-55.
c. AR 385-30.
d. AR 385-40.
e. AR 700-15.
f. AR 700-52.
g. AR 700-64
h. AR 725-1.
i. TM3-261.
j. TM 55-315,
k. TB 43-0166.
l. TB 43-0122.
m. TB 55-1500-314-25.
n. TB 750-242-3.
o. TB 750-249.
p. TB 750-249.
q. TB MED-62.
r. TB MED 232.
s. SB 11-206.
t. AMCR 385-9.
u. AMCR 385-25.
v. AMCR 385-100.
w. MIL M 19590.

DISPOSITION FORM

For use of this form, see AR 340-15, the proponent agency is TAGCEN.

REFERENCE OR OFFICE SYMBOL	SUBJECT
SDSSE-XX	Annual Radiological Inventory

TO RPO FROM D/Supply DATE 20 March 1980 CMT.

In accordance with SEADR 385-1, the following items corstitute the annual radiological inventory for D/Supply:

a. NSN: 6665-00-832-6159
Type: MX7338, Radioactive Test Samples
Isotope: Kr85 Activity: 5.0 uCi

Qty	S/N	Loc.
4 ea	4	5
	5	307
	6	320
	7	320

b. NSN: 6668-00-417-6082
Type: U18, Radioactive Test Samples
Isotope: U238 Activity: 5000+100 cpm

Qty	S/N	Loc.
1 ea	8	320

JOHN DOE
D/Supply

DA FORM 1 FEB 62 2496 REPLACES DD FORM 96, WHICH IS OBSOLETE.

APPENDIX E

PROCEDURE FOR USE OF X-RAY

1. Purpose. To establish procedures for ensuring safety and proper operation of all x-ray equipment used at this installation, as well as the proper maintenance thereof.

2. Scope. This procedure is applicable to the x-ray technician, medical officer, dental officer, or any individual assigned to operate any x-ray machines at this installation.

3. Responsibilities. a. Medical Officer will:

(1) Be responsible for maintaining health standards for all those employed in areas of x-ray exposure.

(2) Render physical examinations to all employees in such areas whether military or civilian.

b. X-Ray Technician will:

(1) Be qualified to operate x-ray equipment at the Health Clinic or Dental Clinic and maintain environmental health standards as adopted by regulations of the Department of the Army, Air Force, Navy, etc., for control of occupational exposure to x-ray radiation.

(2) Be custodian and maintain register of all individuals who besides himself are using film badge or any other instrument to measure x-ray. This register is to be maintained in the x-ray department at the Health Clinic.

c. Individuals employed in industrial x-ray operations: Civilian or military will be responsible to maintain basic radiation protection standards as applied to the individual job in which they are employed.

4. Procedures. a. Personnel Dosimetry:

(1) Each person occupationally exposed to x-rays will wear a film badge. A register of such individuals is to be maintained at the work site, Health Clinic, or Dental Clinic under the responsibility of the supervisor in charge.

(2) Film badges will be obtained from the Calibration Section, Maintenance Division, D/SW.

(a) Orders required for number of badges used will be requested from the above agency.

(b) Exposed badges from x-ray exposure will be forwarded to Calibration Section, Maintenance Division, D/SW, for processing.

(c) Reports of exposure will be forwarded to medical officer for posting on DD Form 1141 and placed in the medical 201 file of the individual, as well as in the medical register for radiation exposures.

b. Medical examinations.

(1) Radiation workers should be given a pre-employment examination which includes medical history, radiation exposure history, physical examination, and a complete blood count. If radiation workers are to be exposed to unsealed radiation sources, appropriate bicassay should be taken to establish base lines.

(2) Any abnormalities will be recorded and carefully considered prior to exposure or continued exposure.

(3) If a similar examination has been conducted within the past six months, those portions of the examination for which results are entered in the individual's record need not be repeated.

(4) Visitors and personnel on temporary duty for less than thirty days do not require a medical examination, provided they will not be exposed to radiation in excess of the levels established by the Army in AR 40-14, or to radioactive concentration in excess of those given in Title 10, Code of Federal Regulations, Part 20, Appendix B, Table II.

(5) Radiation worker should be given a medical examination at least once every three years. Dependent upon the work involved, the medical officer may desire to repeat the examination more frequently.

(6) Upon termination of the occupational exposure, the individual should be given a medical examination.

(7) In the event of an overexposure, a medical examination may be necessary.

c. Safety precautions.

(1) All electrical circuits will be shut off when x-ray equipment is not in use.

(2) Radiation Area warning signs will be placed in all areas designated where x-rays are exposed.

(3) Request to the Army Environmental Hygiene Agency will be made in accordance with TB MED 62 for performance of Radiation Protection Surveys.

(4) X-ray technician will remain behind the lead shield provided when operating the equipment. When a medical technician is required to remain with the patient being x-rayed, the technician will wear a leadlined apron and gloves provided.

(5) All interlocks, "ON-OFF" beam control mechanisms, and safety and warning devices shall be checked and serviced at least every six months. Records of dates, findings and changes shall be kept on file.

d. Maintenance.

(1) A periodic preventative maintenance of all medical and dental x-ray equipment will be performed by the Surgeon General Maintenance Team, Fort Devens, Massachusetts.

(2) In emergencies, in the event that maintenance teams cannot be sent to this installation for correction of any discrepancies, the matter will be brought up to the Commander for contractual arrangements to correct such discrepancies.

5. References. TB MED 62, Diagnostic X-Ray, Therapeutic X-ray and Gamma-Beam Protection for Energies up to 10 Million Electron Volts.

APPENDIX F

DECONTAMINATION

1. Personnel Decontamination. a. Thorough washing with nonabrasive soap and lukewarm water is the best general method of decontamination of the hands and other parts of the body regardless of the contaminant. If the contaminant is localized, it is often more practical to mask off the affected area and cleanse with swabs, rather than risk the danger of spreading the contaminant by general washing. Organic solvents must be avoided as decontaminating agents because they may increase the probability of the radioactive materials penetrating through the pores of the skin. Special attention must be given to the areas between the fingers and around the nails. The outer edges of the hands are readily contaminated and often neglected in the washing.

b. After repeated washings the skin will tend to chap. To avoid this, apply lanolin or hand cream and then continue to wash. If repeated washing with soap and water is unsuccessful in the personnel decontamination, the individual should be referred to the local medical officer for application of the more drastic chemical decontamination listed in National Bureau of Standards Handbook No. 48. If it is suspected that any person, by inhalation, ingestion, or any other manner, has introduced radioactive materials into his body, the local medical officer will be notified immediately so that medical procedures can be initiated to facilitate the elimination of such material. Contamination over a large area of his body or his face will be basis for suspecting that the person is internally contaminated.

c. In the event several individuals have become contaminated or the contamination on an individual is not localized to a small portion of the body, the following decontamination procedure is recommended:

(1) Place individual under a lukewarm shower.

(2) Using a mild toilet soap, individual will cover entire body with lather.

(3) While still covered with lather, individual will step out of shower.

(4) Sprinkle a heavy coat of mild soap flakes all over lathered individual. (Purpose of lather is to cause soap flakes to adhere to person.)

(5) Using his hand, the contaminated individual will run the soap flakes on his body into a paste.

(6) Individual will then return to shower and attempt to rinse soap off his person by starting at the top and working his way down.

NOTE: It will be necessary for individual to rub body surfaces with his hands while rinsing in order to remove soap paste. Soap paste will remain on those areas which have not been thoroughly washed. Although a soft cloth may be used, a brush may not. Particular attention should be given to hairy portions of the body.

(7) When the individual has rinsed himself to the point that he no longer feels slimy and while still under the shower, he will be examined by an assistant for traces of soap. The presence of soap will indicate which areas of the body have not been decontaminated.

(8) After removing all traces of soap, individual will leave the shower and dry himself.

(9) After drying off, individual will be monitored. If individual is still contaminated, procedures will be repeated.

d. In all cases of personnel contamination, the Radiological Protection Officer will be consulted.

2. Equipment and Area Decontamination. a. General.

(1) Care must be tak during the decontamination process to avoid further spread of the contaminant. This can be accomplished by:

(a) Always working from the area of least contamination towards the area of the heaviest contamination.

(b) Taking precautions not to track the contamination. Use protective clothing and shoe covers. Periodically remonitor the area.

(c) Using a minimum amount of decontamination liquids, and being aware that the runoff solutions and mops, rags and brushes will all be contaminated.

(2) The following decontamination methods should be tried in the sequence in which they are listed.

(a) Brushing or vacuum cleaning. Brushing can be accomplished with brooms, brushes or street cleaning equipment. Only vacuum cleaners which are equipped with absolute filters and which have been tested for filtration efficnecy may be used. The filtration efficiency will be tested after each replacement of the filter and each time contents are emptied.

(b) Water and detergent. The area is wetted down with a small quantity of detergent solution. In general, a number of washings will be required to reduce contamination.

(c) Steam Cleaning.

(d) Cleaning with Solvents.

(e) Removing surface contaminations by using chemicals, abrasion, sandblasting, grinding, or electrolysis. (Care must be taken to preclude inhalation of contaminated residue.)

b. Specific Methods. If the above decontamination methods do not work, the following specific methods may be tried:

(1) Metals.

(a) Remove any oily surfaces with organic solvents.

(b) Soak in a solution of citric acid prepared by adding one pint citric acid to one gallon of water.

(c) Soak in a solution of diluted hydrochloric acid prepared by carefully adding one part of commercial grade concentrated hydrochloric acid to four parts of water. Hydrochloric acid should not be used on stainless steel because of the etching which will destroy the smooth surface.

(d) Use metal polish.

(2) Plastics. Clean with ammonium citrate, dilute acids or organic solvents.

(3) Glass and procelain. Clean with detergent solution. If this does not work, soak in concetrated nitric acid or chromic acid cleansing solution.

(4) Painted surfaces. Use liquid scrape-off paint remover, brush, and scraper, or putty knife. Discard the brush with the paint scrapings, decontaminate the scraper with rags. In cases where surfaces were covered with strippable paint, peel the paint from the surface.

(5) Rubber, including respirators, gas masks. Wash with detergent water or with a hot 20 percent (by weight) water solution of sodium citrate.

c. Decontamination of Clothing.

(1) Determine extent of contamination using AN/PDR-27 with the beta shield removed and with the AN/PDR-54 ot AN/PDR-60.

(2) Segregate the clothing into two classes - Class I - for low activity, less than 0.1 millirads per hour above background on AN/PDR-27 and 50 ounces per minute on AN/PDR-54 or AN/PDR-60. Release for ordinary laundering. Laundering involves seven operations of five minutes each, using hot water (120° to 140° F) and additives as indicated below:

(a) First wash - detergent.

(b) Second and third washes - citric acid.

(c) Fourth and fifth washes - Chelating agent such as Versene.

(d) Sixth and seventh washes - water rinses. After the decontaminated items have been laundered and completely dried, they must be checked for any remaining contamination.

Class 2 - For activity higher than 0.1 to 10 millirads per hour on AN/PDR-27 and 50 cpm on AN/PDR-54 or AN/PDR-60. Wash in special laundry facility washer or washer-dryer kept in the facility for washing "hot" clothing only. Use the following steps:

(a) Soak overnight in water solutions of laundry detergent.

(b) Drain.

(c) Wash for 15 minutes with hot water and powdered soap or laundry detergent.

(d) Rinse.

(e) Dry and remonitor.

(3) The following tables summarize the various removal methods for decontamination of various surfaces and Personnel Protective Equipment and Gear.

TAI I

REMOVAL METHODS FOR DECONTAMINATION OF VARIOUS SURFACES

METHOD	SURFACE	ACTION	ADVANTAGES	DISADVANTAGES
Vacuum Cleaning	Dry surface	Removes contaminated dust by suction.	Good on dry porous surfaces. Avoids water reactions.	All dust must be filtered out of exhaust. Machine is contaminated.
Water	All nonporous surfaces (metal, painted, plastic, etc.)	Dissolves and erodes	All water equipment may be utilized. Allows operations to be carried out from a distance. Contamination may be reduced by 50%. Water equip- may be used for solutions of other decontaminating agents.	Drainage must be controlled. Not suitable for porous materials. Oiled surfaces cannot be decontaminated. Not applicable on dry contaminated surfaces; not applicable on porous surfaces such as wood, concrete, canvas. Spray will be contaminated.
Steam	Nonporous surfaces (especially painted or oiled surfaces.)	Dissolves and erodes.	Contamination may be reduced by approximately 90% on painted surfaces.	Steam subject to same limitations as water. Spray hazard makes the wearing of waterproof outfits necessary.
Detergents	Nonporous surfaces (metal, painted, glass, plastic, etc)	Emulsifies contaminant and increases wetting power of water and cleaning efficiency of steam.	Dissolves industrial film and other materials which hold contamination. Contamination may be reduced by 90%.	May require personnel contact with surface. May not be sufficient on long-standing contamination.

Table I (Cont'd)
REMOVAL METHODS OF DECONTAMINATION OF VARIOUS SURFACES

METHOD	SURFACES	ACTION	ADVANTAGES	DISADVANTAGES
Complexing Agents: Oxalates Carbonates Citrates.	Nonporous surfaces (especially unweathered surfaces; i.e., no rust or calcareous growth)	Form soluble complexes with contaminated material.	Holds contamination in solution. Contamination may be reduced by 75% in 4 minutes on unweathered surfaces. Easily stored; carbonates and citrates are non-toxic, noncorrosive.	Requires application for 5 to 30 minutes. Little penetrating power; of small value on weathered surfaces.
Organic Solvents	Nonporous surfaces (greasy or waxed surfaces, paint or plastic finishes, etc.)	Dissolves organic materials (oil, paint, etc.)	Quick dissolving action. Recovery of solvent possible by distillation.	Requires good ventilation and fire precautions. Toxic to personnel. Material bulky.
Inorganic Acids	Metal surfaces (especially with porous deposits; i.e., rust or calcareous growth); circulatory pipe system.	Dissolves porous deposits.	Corrosive action on metal and porous deposits. Corrosive action may be moderated by addition of corrosion inhibitors to solution.	Personnel hazard. Wear goggles, rubber boots, gloves, and aprons. Good ventilation required because of toxicity and explosive gases. Acid mixtures should not be heated. Possibility of excessive corrosion if used without inhibitors. Sulfuric acid not effective on calcareous deposits.

TABLE I (cont'd)
REMOVAL METHODS FOR DECONTAMINATION OF VARIOUS SURFACES

METHODS	SURFACES	ACTION	ADVANTAGES	DISADVANTAGES
Acid Mixtures: Hydrochloric Sulfuric Acetic Acid Citric Acid Acetates Citrates	Nonporous surfaces (especially with porous deposits); circulatory pipe systems.	Dissolves porous deposits.	Contamination may be reduced by 90% in 1 hour (unweathered surfaces). More easily handled with inorganic acid solutions.	Weathered surfaces may require prolonged treatment. Same safety precautions as required for inorganic acids.
Caustics: Lye (sodium hydroxide) Calcium hydroxide Potassium hydroxide	Painted surfaces (horizontal).	Softens paint (harsh method)	Minimum contact with contaminated surfaces. Easily stored.	Personnel hazard (will cause burns). Reactions slow; thus, it is not efficient on vertical or overhead surfaces. Should not be used on aluminum or magnesium.
Trisodium phosphate	Painted surfaces (vertical, overhead).	Softens paint (mild method)	Contamination may be reduced to tolerance in one or two applications.	Destructive effect on paint. Should not be used on aluminum or magnesium.
Abrasion	Nonporous surfaces.	Removes surface.	Contamination may be reduced to as low as desired	Impracticable for porous surfaces because of penetration by moisture.
Sandblasting	Nonporous surfaces.	Removes surface.	Practical for large surface area.	Contamination spread over area must be recovered. Contamination dust is personnel hazard.
Vacuum blasting	Porous and nonporous surfaces.	Removes surface; traps and controls contaminated waste.	Contaminated waste ready for dispersal. Safest abrasion method.	Contamination of equipment.

TABLE II
PERSONNEL PROTECTIVE EQUIPMENT AND GEAR

ITEM	REMARKS
Clothing:	
Cotton coveralls.....	Should be of a fine weave impermeable to dust. Use for dry survey operations.
Waterproof parka, trouser, or rain gear.....	For wet or cold operations.
Eye Protection:	
Goggles, face shield, and hood.....	Protects against contamination to eyes.
Headgear:	
Protective hat or helmet.....	Protects against falling debris.
Surgical cap or cotton winter hood.....	Dust protection to the hair.
Handgear:	
White knit cotton gloves	For dry survey work.
Rubber gloves.....	For wet operations and handling certain types of radioactive materials.
Leather gloves.....	For handling sharp objects.
Footgear:	
Safety shoes.....	Foot protection.
Rubber boots.....	Safety toe and lining; knee high or thigh high used for wet operations.
Protective toxicological agent boot.....	To fit over boots to provide dust-protection.

TABLE VI (Cont'd)
PERSONNEL PROTECTIVE EQUIPMENT AND GEAR

ITEM	REMARKS
Breathing equipment:	
Mask with proper canister.....	(See TB MED 223) General breathing protection against toxic fumes.
Mask with self-contained air supply.....	Protection against toxic smoke and specific airborne radioactive materials. (NOTE: Exposed areas of neck and head must be protected where exposure is to radioactive materials.)
Respirator.....	Dust protection.
Radiac equipment:	
Radiacmeter.....	Field survey for alpha, beta, gamma X-ray.
Dosimeter.....	Measures dose received.

APPENDIX I

HANDLING CONVENTIONAL AMMUNITION CONTAINING DEPLETED URANIUM

1. The basic radiological procedures, including Radiological Protection Officer's responsibilities, for handling conventional ammunition containing Depleted Uranium while being received, stored, shipped or inspected at Seneca Army Depot are contained in the following documents:

a. Standing Operating Procedure AMXSE-60, Subject: Conventional, Guided Missile, and Depleted Uranium Ammunition Items: Receipt, Storage and Shipment.

b. Standard Operating Procedure DRXSE 600-18, Subject: Receiving and Shipment Inspection of various 1305 Depleted Uranium Ammunition.

c. Nuclear Regulatory Commission License #SUC-1275.

2. In addition to the procedures contained in the above documents, the requirements of Title 10, Code of Federal Regulations will be strictly adhered to, with emphasis on the following:

a. Receipt of Source Materiel. Inbound shipments of Depleted Uranium munitions will be monitored no later than 3 hours after arrival if during normal duty day, or 18 hours after arrival if received after normal working hours.

b. Swipe Tests. A copy of swipe test results will be forwarded to the office of the RPO by Fire Gage Lab personnel.

c. Reports. The transfer or receipt of 1,000 kilograms or more of Depleted Uranium will require the initiation and/or completion of a Nuclear Material Transaction Report on NRC Form 741. Time frames and number of copies of report are as follows:

(1) When transferring 1,000 or more, kilograms of DU, the transferer shall submit one copy of NRC Form 741 to the Commission and three copies to the receiver promptly after the transfer takes place.

(2) When receiving shipments of DU, transferee will complete Section 17 of NRC Form 741 and will submit a completed copy to the Commission and to the shipper of the material within ten (10) days after the receipt. A copy of NRC Form 741, along with the shipping documents, will be forwarded to the office of the RPO.

d. Transfer of Source Material. Before transferring any source material, the RPO shall verify that the license of the receiving agency authorizes receipt of the type, form and quantity of source material to be transferred. This will be accomplished by one of the following methods:

(1) Possess a copy of receiver's specific license or registration certificate.

(2) Possess a written certification from the transferee that he is authorized by license or registration certificate to receive the source material to be transferred. License or registration certificate number, issuing agency and expiration date must be stated.

(3) For emergency shipments oral certification may be acceptable provided it is followed up by written confirmation within ten (10) days.

(4) The transferer may obtain other sources of information compiled by a reporting service from official records of the Commission or the licensing agency of an Agreement State as to the identity of licenses and the scope and expiration dates of licenses and registrations.

(5) Transferer may obtain and record confirmation from the Commission or the licensing agency of an Agreement State that the transferee is licensed to receive the source material.

e. Notification of Failure to Comply or Existence of a Defect: In the event that readings obtained on inbound shipments exceed the requirements established by local procedure, the RPO will be contacted immediately. Upon evaluation by the RPO, decontamination procedures will begin and the shipper will be notified so evaluation can be made of the deviation and corrective action taken. Notification of the shipper of a deviation will be via telephone followed up by written correspondence requesting corrective action from the vendor.

3. In addition to the requirements of the above paragraph, the following will be strictly adhered to:

a. A director or responsible officer subject to the regulations of Part 21 of Title 10 CFR or a designated person shall notify the Commission when he obtains information reasonably indicating a failure to comply or a defect affecting:

(1) The construction or operation of a facility or an activity within the United States that is subject to the licensing requirements under Parts 30, 40, 50, 70 or 71 of Part 21 of Title 10 CFR and that is within his organization's responsibility, or

(2) A basic component that is within his organization's responsibility and is supplied for a facility or an activity with the United States that is subject to the licensing requirements under Parts 30, 40, 50, 70 or 71, of Part 21 of Title 10 CFR.

The above notification is not required if such individual has actual knowledge that the Commission has been adequately informed of such defect or such failure to comply.

60

b. Initial notification required by this paragraph shall be made within two (2) days following receipt of the information. Notification shall be made to the Director, Office of Inspection and Enforcement, or to the Director of a regional office. If initial notification is by means other than written communication, a written report shall be submitted to the appropriate office within five (5) days after the information is obtained. Three copies of each report shall be submitted to the Director, Office of Inspection and Enforcement.

c. The written report required by this paragraph shall include, but need not be limited to, the following information, to the extent know:

(1) Name and address of the individual or individuals informing the Commission.

(2) Identification of the facility, the activity, or the basic component supplied for such facility or such activity within the United States which fails to comply or contains a defect.

(3) Identification of the firm constructing the facility or supplying the basic component which fails to comply or contains a defect.

(4) Nature of the defect or failure to comply and the safety hazard which is created or could be created by such defect or failure to comply.

(5) The date on which the information of such defect or failure to comply was obtained.

(6) In the case of a basic component which contains a defect or fails to comply, the number and location of all such components in use at, supplied for, or being supplied for one or more facilities or activities subject to the regulations in Part 21 of Title 10 CFR.

(7) The corrective action which has been, is being, or will be taken; the name of the individual or organization responsible for the action; and the length of time that has been or will be taken to complete the action.

(8) Any advice related to the defect or failure to comply about the facility, activity, or basic component that has been, is being, or will be given to purchasers or licensees.

APPENDIX K

LIST OF AVAILABLE RADIATION SURVEY INSTRUMENTS

TYPE OF INSTRUMENT	NUMBER AVAILABLE	RADIATION DETECTED	SENSITIVITY RANGE mr/hr	THICKNESS WINDOW mg/cm^2	MONITORING/SURVEY INC/ MEASURING
RADIATION DETECTOR AN/PDR 27	11	Beta Gamma	0.5 - 500		Surveying, Measuring
RADIATION DETECTOR AN/PDR 54	16	Alpha	0 - 100,000 CPM		Surveying, Measuring
RADIATION DETECTOR AN/PDR 60	3	Gamma Alpha	0.0 - 2 r/hr 0 - 200,000 CPM	1.5	Surveying, Measuring
RADIACMETER IM-174A/PD	6	Gamma	0.0 - 500 ./hr		Surveying (Tactical)
COUNTER, SCALER THIN WINDOW CHAMBER NUCLEAR MEAS. CORP. MODEL PC5	2	Beta Alpha	10^7 CPM	.9	Measuring

APPENDIX J

CONTROL AND PROCESSING OF FILM BADGES

1. The Calibration Section, D/SW, located in Bldg. #815, will, on a monthly schedule, process all film badges on a direct exchange basis.

2. To insure that each individual assigned a film badge wears his/her own film badge, film badge holders will contain some identification of that individual. For example, the individual's name on a small square of paper or embossing tape will be attached to the front or back of the film badge holder. Under no circumstances will one individual wear another individual's film badge.

3. Upon leaving the controlled area at the end of the work day, the individual will remove his/her film badge and place it in the specified storage area designated by the supervisor of that work section. The control film badge for each section will be stored in the same location, as all other film badges assigned that section.

4. In addition to the collection and monthly exchange of film badges, the Calibration Section will be responsible for preparing DA Form 3484 (Photo Dosimetry Report) in accordance with SB 11-206 and will forward it to Lexington Blue Grass Army Depot with the film badges. Upon return of the processed DA Form 3484, the Calibration Section will forward one copy to the Medical Officer, USA Health Clinic, for posting to the individual's DD Form 1141 (Record of Occupational Exposure to Ionizing Radiation). An additional copy of DA Form 3484 will be forwarded to the Radiological Protection Officer (RPO) and a copy will be maintained on file by the Calibration Section, D/SW.

5. Supervisors for each concerned work section are responsible for establishing control, handling, and storage responsibilities for their sections. Film badges used by Alpha Team personnel responsible for providing radiological monitoring assistance to the USA Health Clinic during NAIC operations will be maintained with the Quality Assurance Section, Bldg. #175.

6. Requirements for additional film badges or any questions concerning film badges can be resolved by calling the Supervisor, Calibration Section, D/SW at extension 18-566.

REFERENCE

T. O. 11A13-14-7
SDSSE-60
SDSSE-RA-600-18
AR-385-11
TM-3-261
AR-700-64
SEADR 385-1
Dwg #5073K107
Dwg #785040 Rev. B
Container Certification #78-51
DOT -E -8101

DRAFT

ENVIRONMENTAL REPORT

I. It is proposed that SENECA ARMY DEPOT be allowed to continue storage of 30 millimeter, Depleted Uranium (DU) Ammunition. This includes shipping, receiving, inspection, and storage.

II. A storage location is necessary on the east coast to service military locations overseas. This would be more economical than one location in the central or western states.

III. The only alternative considered was moving the storage location to another depot. This would not be advisable because SENECA ARMY DEPOT already has the trained personnel, emergency response teams and emergency procedures to cope with any problems.

IV. There has been no adverse environmental impact due to the storage of 30 millimeter DU ammunition on SENECA ARMY DEPOT since 1976. The ammunition is stored so that, in the event of an accident, no radioactive material would be released beyond the confines of SENECA ARMY DEPOT. Trained monitoring teams are present on depot to determine any spread of contamination. SENECA ARMY DEPOT has access to Department of Defense and Department of Energy emergency teams for assistance.

V. NRC License, SUC-1275 is a current license for the storage of 30mm DU ammunition. SENECA ARMY DEPOT has on open burning permit for conventional ammunition. This is a New York State permit #8B4530890008. SENECA ARMY DEPOT also has a conventional ammunition deactivation furnace permit (New York State permit #817523).

VI. Mr. Thomas Battaglia, Environmental Engineer, Facilities Engineering Division, Seneca Army Depot was consulted.

DRSSF-P 6 February 1979

SUBJECT: Planning Guidance for Fires Involving GAU-8 30mm DU Munitions

Commander, US Army Armament Materiel Readiness Command, ATTN: DRSAR-SF, DRSAR-DA, Rock Island, IL 61299
Commander, US Army Depot System Command, ATTN: DRSDS-OSU, DRSDS-PS, DRSDS-CM, Chambersburg, PA 17201

1. In the event of the subject rounds catch fire during storage or transportation, the attached graphs and tables show the radius of the 22 degree pie shaped area wherein personnel must be promptly protected.

2. The graphs and charts are based on a computer study of the limited USAF test data and of the long term occupational exposure criteria. The lack of concrete data on how much airborne respirable dust would be generated if the rounds burned requires that the stability class "F" table and graph be used for planning purposes. This is also desirable because of our inability to determine the meterological stability class.

3. Within the 22 degree pie shaped area, unprotected personnel must be immediately evacuated or kept indoors with all outside air intakes shut off during the fire. To assure this can be accomplished, storage sites must choose their magazine locations carefully considering the windrose data, the amount to be stored per igloo in reference to occupied areas and preplan how personnel will be alerted to stay indoors or be evacuated. Within the 22 degree sector, only persons wearing respiratory protection will be safe. The inclosed data will also be used by DRSCCM shippers to provide carrier's guidance should a fire occur during transit.

4. The tables and graphs may not be used for open pit burning operations as the downwind distances required for nonemergency exposure of non-radiation personnel is considerably further than those given in the attached tables and charts.

DRCSF-P 6 February 1979
SUBJECT: Planning Guidance for Fires Involving GAU-8 30mm DU Munitions

5. After the USAF completes its burn tests, which slipped from February 79 to May 79 and more recently to September 79, the charts and tables will be revised.

FOR THE COMMANDER:

1 Incl
as

DARWIN N. TARAS
Chief, Health Physics
Safety Office

CF:
Commander, Sierra Army Depot, Herlong CA 96113
Commander, Seneca Army Depot, Romulus, NY 14541
Commander, Hawthorne Army Ammunition Plant, Hawthorne, NV 89415

CONCURRENCE & CF:
DRCMM-ST Hodges [illegible]
GA-PA [illegible]

Mr. Taras__________
49340/sec

DEPARTMENT OF THE ARMY
US ARMY MOBILITY EQUIPMENT RESEARCH & DEVELOPMENT COMMAND
FORT BELVOIR, VIRGINIA 22060

DRDME- VR

2 February 1979

CONTROL BOUNDARY FOR FIRES OF DEPLETED URANIUM IN STORAGE

Report No.: 08661RJAY-3

Requested by: DARCOM Safety
DRCSF-P

Authority: A928941FK11

1. Purpose: This report provides control boundaries to be established when fires occur in areas where depleted uranium (DU) are stored.

2. Reference: DRDME-VR, Report No. 08661RJAY-2, dated 18 Jan 79, Subject: Dispersal of Uranium During a Fire.

3. Results: The tables and graphs in this report are based on the control limit of 25 milligram-hour per cubic meter, which will limit the total absorbed uranium for the working adult to 7.8 mg Three tables are presented giving the control boundaries at various wind speeds for stability classes F, D and B. The graphs for the same information are shown as a single curve for each stability class. The abscissa for the graphs is obtained by dividing the quantity in storage (kg) by the wind speed in meters per second.

When a fire occurs and the wind speed or stability class is unknown, then the following assumptions will be made:

(1) The wind speed is 1 meter per second.

(2) The stability class is F.

4. Recommendation: It is recommended that these graphs and tables be readily available for emergency personnel and that initial control boundaries be established for each storage area.

DELET-VR 2 February 1979

SUBJECT: Control Boundary for Fires of Depleted Uranium In Storage

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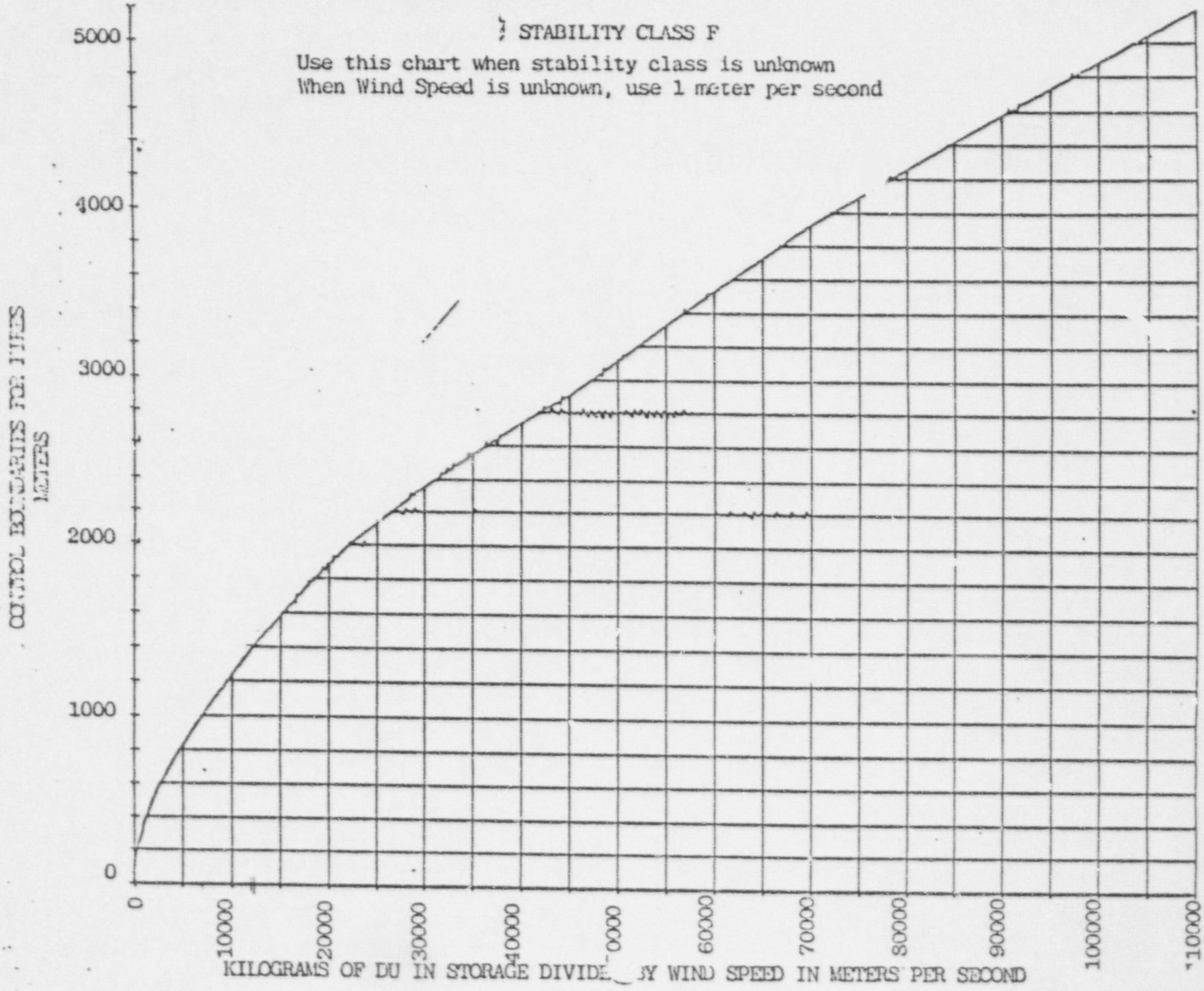
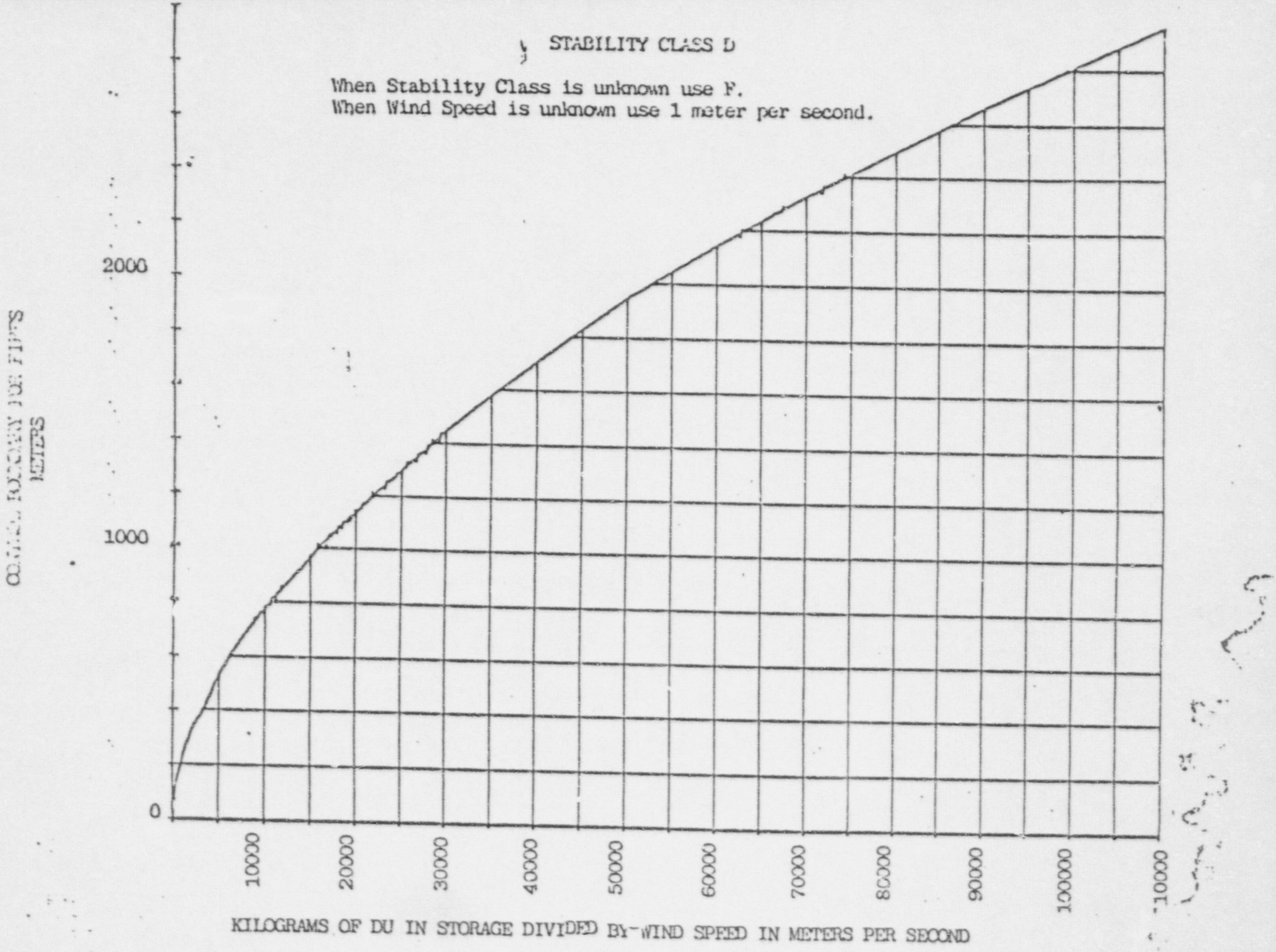
SUBMITTED BY: ROBERT C. McMILLAN
Chief, Radiation Research Group

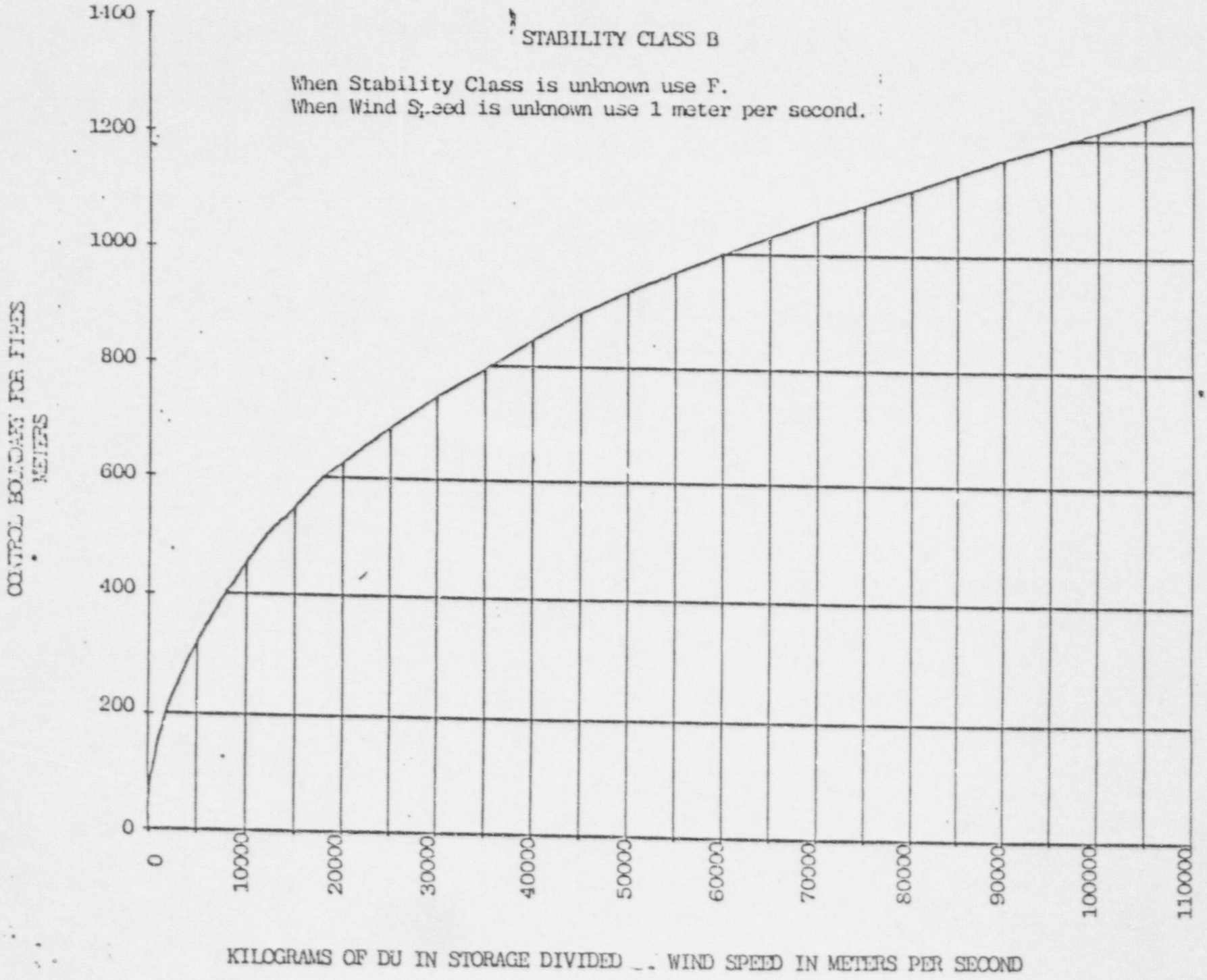
FORWARDED BY: EMIL J. YORK
Chief, Material Technology Laboratory


STABILITY CLASS F
Use this chart when stability class is unknown
When Wind Speed is unknown, use 1 meter per second
CONTROL BOUNDARIS FOR FIRES
METERS
5000
4000
3000
2000
1000
0
0
10000
20000
30000
40000
50000
60000
70000
80000
90000
100000
110000
KILOGRAMS OF DU IN STORAGE DIVIDED BY WIND SPEED IN METERS PER SECOND

STABILITY CLASS D

When Stability Class is unknown use F.
When Wind Speed is unknown use 1 meter per second.




STABILITY CLASS B
When Stability Class is unknown use F.
When Wind Speed is unknown use 1 meter per second.
1400
1200
1000
800
600
400
200
0
0
10000
20000
30000
40000
50000
60000
70000
80000
90000
100000
110000
KILOGRAMS OF DU IN STORAGE DIVIDED BY WIND SPEED IN METERS PER SECOND
OUTER BOUNDARY FOR FIRES
METERS

OR STABILITY CLASS F.

AMOUNT STORED (KG)	WIND SPEED (M/S) 1	2	5	8	10
	DISTANCES(KM)				
1000	0.354	0.24	0.143	0.11	0.099
2000	0.514	0.354	0.21	0.162	0.143
5000	0.829	0.58	0 354	0.274	0.24
8000	1.088	0.74	0.455	0.354	0.316
10000	1.24	0.829	0.514	0.398	0.354
20000	1.884	1.24	0.74	0.58	0.514
30000	2.35	1.586	0.92	0.717	0.64
40000	2.737	1.884	1.086	0.829	0.74
50000	3.109	2.132	1.24	0.941	0.829
60000	3.525	2.35	1.385	1.046	0.92
70000	3.925	2.55	1.521	1.148	1.003
80000	4.261	2.737	1.645	1.24	1.086
90000	4.58	2.909	1.767	1.332	1.163
100000	4.883	3.109	1.884	1.42	1.24
110000	5.187	3.323	1.991	1.504	1.314

FOR STABILITY CLASS D.

AMOUNT STORED (KG)	WIND SPEED (M/S) 1	2	5	8	10
	DISTANCES(KM)				
1000	0.216	0.15	0.094	0.074	0.066
2000	0.32	0.216	0.134	0.105	0.094
5000	0.529	0.354	0.216	0.169	0.15
8000	0.692	0.456	0.285	0.216	0.191
10000	0.778	0.529	0.32	0.247	0.216
20000	1.139	0.778	0.456	0.354	0.32
30000	1.444	0.966	0.588	0.436	0.383
40000	1.705	1.139	0.692	0.529	0.456
50000	1.943	1.298	0.778	0.602	0.329
60000	2.142	1.444	0.854	0.667	0.588
70000	2.326	1.577	0.927	0.726	0.642
80000	2.498	1.705	1.003	0.778	0.692
90000	2.659	1.827	1.07	0.826	0.737
100000	2.812	1.943	1.139	0.872	0.778
110000	2.955	2.045	1.204	0.917	0.816

FOR STABILITY CLASS B.

AMOUNT STORED (KG)	WIND SPEED (M/S) 1	2	5	8	10
	DISTANCES(KM)				
1000	0.144	0.099	0.062	0.048	0.043
2000	0.206	0.144	0.09	0.07	0.062
5000	0.321	0.229	0.144	0.112	0.099
8000	0.403	0.289	0.184	0.144	0.128
10000	0.452	0.321	0.206	0.162	0.144
20000	0.625	0.452	0.289	0.229	0.206
30000	0.743	0.549	0.35	0.28	0.251
40000	0.846	0.625	0.403	0.321	0.289
50000	0.933	0.687	0.452	0.357	0.321
60000	1.001	0.743	0.496	0.39	0.35
70000	1.062	0.794	0.531	0.422	0.377
80000	1.113	0.846	0.566	0.452	0.403
90000	1.166	0.894	0.6	0.48	0.428
100000	1.214	0.933	0.625	0.507	0.452
110000	1.26	0.968	0.651	0.527	0.475