

Encl 1
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NAVSUPINST 4000.34C
AFJI 23-504
MCO P4400.105D

RESEARCH AND DEVELOPMENT, TEST, AND EVALUATION

A. RESEARCH AND DEVELOPMENT PHASE

1. The least hazardous material, by volume and toxicity, shall be incorporated in all DoD material and be consistent with operational effectiveness and overall system cost. Major factors to consider during hazard analyses and risk measurements include: the impact on operational characteristics; radioactive material licensing; military readiness; the additional cost for radioactive materials which may be involved in procurement (such as licensing); quality assurance; record keeping; training; accountability; transportation; facility restoration; bulk storage; environmental consequences; disposal; and safety, to include requirements for personal protective equipment (PPE). Health Physics personnel shall be identified as a member of the Integrated Process Team (IPT) for all systems considering the incorporation of radioactive material(s) into items or radiation producing devices.

2. Purpose, use and environmental factors shall be considered in designing tests to establish and demonstrate the military usefulness and safety of the radioactive item. Drop, shock, vibration, temperature extreme tests, altitude, pressure, and accelerated weathering tests (e.g., such as those established in 10 CFR 32), as appropriate, should be used in the design tests. Reference tests are intended for luminous safety items used in aircraft and military equipment, which may be subjected to similar extremes during normal use and storage.

3. Training programs shall be developed that integrate the aspects of life-cycle control, radiation safety, and logistical management and these programs shall be transmitted to the respective training activities for inclusion into appropriate training programs of instruction.

(a) Develop and coordinate instructions, specifications, and required military equipment with affected DoD elements.

(b) Technical letters, reports, orders, manuals, specifications and other life cycle instructions shall be developed, as appropriate, to address relevant health physics and life cycle concerns and controls, respectively. This information shall be used in the development of appropriate field instructions. These documents shall ensure all personnel engaged in the procurement, inspection, transportation, storage, use, maintenance, calibration, control, and disposal of radioactive material are aware of the potential hazards, the precautions required to maintain ALARA; and their responsibilities in the overall life cycle control management of the radioactive item(s).

4. Safety and health data shall be obtained as early as practicable in the research and development (R&D) phase to support continuing R&D efforts to

include user and operational testing. The Service or Agency HMIS focal point(s) shall ensure that data required by DoD 6050.5-M and other Service/Agency directives is included in the DoD HMIS.

5. The incorporation of radium in new Government or military items is strongly discouraged. Any previously developed items containing radium shall be evaluated for suspension or elimination.

B. TEST AND EVALUATION

1. Evaluations of the potential safety and health hazards of each item and system will be conducted throughout all developmental testing and operational testing, as established by Service or Agency directives.

2. The results of developmental tests, operational tests and other tests performed by the manufacturer before procurement shall be summarized and forwarded to the appropriate Commander, Material and Supply Commands for incorporation into the application(s) for the required license(s) and Service or Agency authorization(s).

C. NONDEVELOPMENTAL RADIOACTIVE ITEMS

1. "Nondevelopmental Radioactive Items" (FAR 2.101) means:

(a) Any previously developed item of supply used exclusively for governmental purposes by a Federal agency, a state or local government, or a foreign government with which the United States has a mutual defense cooperation agreement.

(b) Any item described in subparagraph (a) above, requiring minor modification or modification of a type customarily available in the commercial marketplace in order to meet the requirement of the procuring Service or Agency.

(c) Any item of supply being produced that does not meet the requirements of subparagraph (a) or (b), above, solely because the item has not been fielded.

2. Services or Agencies procuring these items shall ensure testing requirements or appropriate military specifications for non-developmental radioactive items have been evaluated for safety and health hazards. These evaluations shall be performed by a technically qualified individual, as determined by Service or Agency.

3. The procuring Service or Agency has responsibility for the overall management of life cycle control of these item(s), including disposal.

D. SPECIFICATIONS, PURCHASE DESCRIPTION, AND DRAWINGS. Specifications, purchase descriptions, and drawings for radioactive items or components shall include:

1. Provisions of Federal regulations and other appropriate standards.

2. A statement that potential contractors must fulfill requirements for obtaining an NRC or Agreement State license and Service or Agency authorizations, as appropriate.

3. Non-developmental radiological information contained in enclosure 2 for proper identification.

4. The license or permit number of the Service or Agency having ownership of the item.

5. A clause containing the radiological information in enclosure 2 of this instruction to ensure proper identification throughout item's life cycle.

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LOGISTICS PHASE OF THE LIFE CYCLE CONTROL

A. CONTROL OF RADIOACTIVE MATERIAL

1. Service or Agency shall implement procedures to ensure those DoD activities who receive, store, transport, possess and dispose of radioactive items identify the items as containing radioactive material. This will permit recognition and accurate accountability of the items.

2. Control may apply to accountable, expendable or other non-accountable property containing radioactive material. The degree of control exercised during any phase of an item's life cycle shall be appropriate for the types and quantities of radioactive items involved and for the kinds of operations to be conducted.

B. LICENSES AND SERVICE OR AGENCY AUTHORIZATIONS

1. Operations performed under an NRC license require meticulous attention to detail to achieve compliance. The conditions of each license and Service or Agency authorization shall be complied with precisely; since violation can be grounds for revocation of the NRC license, assessment of civil penalties, and declaration of work stoppage. Compliant operations are directly related to core mission and functional capability.

2. Developing, testing, manufacturing or storing radioactive materials or items at or on DoD facilities must be with the concurrence from the Service/Agency or host controlling the real estate. All tenants on DoD facilities shall provide annually to the host installation the type and quantity of radioactive material under their control and possession.

3. Items containing accelerator produced or naturally occurring radioactive material shall be regulated by Service or Agency authorization or directives.

4. The Service or Agency having custodial or logistical responsibilities (as defined by this instruction) for radioactive items shall obtain, or have the item(s) added to an existing NRC license(s) or Service or Agency authorization(s), as appropriate, and will ensure that the information required for proper identification contained in enclosure 2 is entered into the appropriate data systems (e.g., Hazardous Material Information System).

5. When applicable, documents for license application(s), Service or Agency authorizations or amendments shall be coordinated, in their entirety, among appropriate DoD elements and their respective Headquarters prior to their submission.

6. The Service or Agency shall ensure NRC licensed material and Service authorized material under its control is transferred only to individuals or organizations authorized to receive them. The item manager or person directing the transfer shall ensure the receiving activity is authorized to receive the material.

7. NRC License applications shall be factual and complete and accomplished in accordance with (IAW) applicable Federal, Service and Agency directives.

8. The procuring Service or Agency shall develop the required procedural, safety, and environmental documents necessary to obtain the required licenses and Services or Agency authorizations.

C. PROCUREMENT OF RADIOACTIVE ITEMS

1. All developmental and procurement contracts for items and major end items shall include pertinent radiological information and clauses for proper identification of items or end items that will incorporate radioactive material(s) as prescribed by enclosure 2.

2. Procurement or reprourement shall be coordinated with the NRC licensee or Service or Agency prior to initiation to ensure compliance with existing or pending license or authorization conditions. This includes the Defense Logistics Agency as a primary storage and distribution activity.

3. Potential contractors shall be advised of the possible need for an NRC or Agreement State license to manufacture the radioactive item being procured or reprocured.

4. Radiological safety and health requirements shall be incorporated into the procurement contract(s).

5. Contracts involving radioactive materials shall include the special clause(s) specified in the Federal Acquisition Regulation (FAR) and appropriate FAR supplements including but not limited to the identification of items as a radioactive material.

D. QUALITY ASSURANCE AND INSPECTION

1. Surveillance and verification (i.e., Quality Control Audits) of a small random sample shall be conducted by the owning Service or Agency, where applicable, on radioactive items in storage and while in use by the Services. Quality assurance procedures will include instructions for action(s) to be taken when one or more samples fail quality assurance testing. The Service or Agency inspectors shall be adequately trained in radiological procedures prior to radiological associated work assignment. Quality assurance and inspections programs are required for radioactive material specifically licensed in accordance with 10 CFR 32; and packaging and transport of radioactive material in accordance with 10 CFR 71.

2. Radioactive items will be leak tested, as required, IAW NRC License(s) and Service or Agency requirements. All packages containing radioactive items will be wipe tested in accordance with 10 CFR, NRC, Department of Transportation (DOT) and applicable Service or Agency directives.

3. Only those personnel who have received formal training and who have demonstrated their ability to perform the required quality assurance testing

shall perform acceptance testing, verification testing and quality audits. The criteria for this responsibility will be coordinated among the responsible licensing authority, appropriate Services Material Readiness Command(s) and quality assurance activities.

4. Quality assurance audits [independent of supplier(s) and Government quality assurance inspector(s)] shall be performed as required by Services and shall conform to the sampling criteria and tables established in Service or Agency directives.

E. IDENTIFICATION OF RADIOACTIVE ITEMS

1. Detailed physical characteristics concerning the radioactive properties of specific items can be found in DoD 6050.5-L, DoD 6050.5-LR and Service or Agency data systems. The Service or Agency will ensure that all radioactive items are identified in a manner required by the Hazardous Communication Program, Title 29, CFR. Data for each different item will be coordinated with and developed by the appropriate Service or Agency Radiation Safety focal point or NICP for entry into the HMIS or other Service/Agency applicable system(s). Data maintained in the HMIS shall be processed in accordance with DoD 6050.5-M.

2. The Service or Agency Hazardous Communications Program Radiation Safety focal points of contact are listed below:

(a) For Defense Logistics Agency: Director, Headquarters, Defense Logistics Agency, ATTN: CAAE, 8725 John J. Kingman Road, Suite 2639, Fort Belvoir, VA 22060-6221.

(b) For the Department of the Army: Commander, U.S. Army Communications-Electronics Command (CECOM), ATTN: AMSEL-SF, Fort Monmouth, NJ 07703-5024.

(c) For the Department of the Air Force: 2402 E. Drive, Brooks Air Force Base, TX 78235-5114, DET1, HSC/OEBZ.

(d) For the Department of the Navy: Naval Sea Systems Command Detachment, Radiological Affairs Support Office (RASO), NWS P.O. Drawer 260, Yorktown, VA 23691-0260.

3. The DoD integrated material manager shall ensure logistics item identification data contains the following:

a. National Stock Number (NSN).

b. Commercial and Government Entity (CAGE).

c. Item Manager and/or Nuclear Regulatory Commission (NRC) License(s) or Service Authorization.

d. Part Number (PN) (i.e., the module or matrix containing the radioactive material).

e. Item Name (i.e., Nomenclature of the radioactive component in the NSN assembly).

f. Variation Code (Number use to distinguish different items of the same NSN/CAGE).

g. Radionuclide (Name of the radioactive material in the NSN item; e.g., Cobalt-60).

h. Radioactivity (Amount of Curies or Bequerels contained in the NSN item).

i. Replacement NSN (Replacement item when it contains radioactive material).

j. Hazardous Characteristic Code (A1-licensed, A2-licensed exempt and A3-authorized).

k. End Item (Name of the end item or assembly NSN containing the

radionuclide).

1. Any additional information deemed necessary to clearly identify radioactive material item(s) and device(s) upon receipt by Service or Agency.

4. Items and packaging of radioactive materials shall be marked and labeled in accordance with reference MIL-STD-129N.

5. Items found to contain radioactive material not properly procured and identified in accordance with this instruction shall be brought to the attention of the DoD Integrated Material Manager(s) for evaluation and resolution. The Hazard Communication Program Radiation Safety focal point for the Service or Agency or NICP shall ensure the development and maintenance of required minimum critical data on radioactive items managed by their respective Service or Agency, as specified in subparagraph 3, above.

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PROTECTION OF PERSONNEL HANDLING RADIOACTIVE ITEMS

A. GENERAL. Procedures will be developed for the protection of DoD personnel handling radioactive items (e.g., shipment, inspection, storage, possession, maintenance and disposal operations) in accordance with Service or Agency directives. This chapter provides radiation exposure standards and policies as guidance. See appropriate Federal, DoD, and Services references listed in paragraph A of this instruction for authoritative radiation exposure standards and policy.

B. RADIATION EXPOSURE STANDARDS AND POLICY

1. The whole body [total effective dose equivalent (TEDE)] annual exposure limits for occupationally exposed individuals is 5 Rem per year and for non-occupationally exposed individuals (general public), is 0.1 Rem per year.

(a) Individuals, under 18 years of age, who are occupationally exposed to radiation shall be limited to 10 percent of the annual (TEDE) dose limits for adult workers as specified in 10 CFR 20.

(b) The Service or Agency shall ensure that the dose (TEDE) to an embryo/fetus during the entire pregnancy, from occupational exposure of a declared pregnant woman, does not exceed 0.5 Rem. The Service or Agency shall make every effort to avoid substantial variation above a uniform monthly exposure rate to a declared pregnant woman as set forth in 10 CFR 20.

(c) Potential airborne radioactive material areas shall be evaluated by a Health Physicist or qualified expert to ensure that the annual limits set forth in 10 CFR 20 are not exceeded.

2. Personnel exposure to ionizing radiation shall be kept ALARA in accordance with DoDI 6055.8. Minimizing radiation exposure and controlling radioactive items are the responsibility of the Commanders, Supervisors and Radiation Safety Officers (RSO). This responsibility includes orientation and indoctrination of personnel subject to exposure to radiation, implementation of applicable directives and standard operating procedures and provisions for personnel dosimetry, medical examinations, and anti-contamination clothing and equipment, when required.

3. Exposure and contamination limits are specified by Federal regulations and guidance and Service or Agency directives.

C. TYPES OF HAZARDS

1. An external radiation hazard is when ionizing radiation reaches the body (outside) from an external radiation source. The hazard considered here is ionizing radiation emitted from the radioactive items during handling and storage, and not from the natural background radiation.

(a) External exposure may be reduced by limiting time of exposure; increasing the distance between personnel and the source of radiation; and increasing the amount of shielding between personnel and the radiation source.

(b) Individual personnel dosimetric devices shall be used as required by 10 CFR 20, 29 CFR and Service or Agency directives to monitor exposure to ionizing radiation.

(c) Area radiation detectors, dosimetric devices, portable radiation monitoring instruments and protective equipment shall be used to ensure radiation protection and are appropriate for the type of radiological hazard known.

2. All radioactive material entering the body (inside) is an internal radiation hazard. Radioactive material can enter the body by being inhaled, ingested, injected or absorbed through the skin. Prohibit smoking, eating, drinking, storage of foods, beverages and application of cosmetics in areas where radioactive materials are handled. Practice good personal hygiene (e.g., washing hands, washing face, etc.) upon leaving such areas. If internal radiation hazards are probable, a bioassay program may be required. The program shall be administered by the Service or Agency directive.

3. Precautions shall be taken to reduce internal exposure from occurring while handling leaking sources, repairing damaged radioactive items, working in contaminated or poorly ventilated storage areas containing leaking gaseous sources, and during accidents. The degree of hazard depends upon the amount and type of radioactive material and in which organs it is deposited. Control and prevention of contamination are the most effective ways to reduce internal hazards.

4. If there is a high probability of contamination occurring, additional engineering controls to prevent radioactive materials from entering the body through the nose, mouth, skin or lungs include:

(a) Providing monitoring instruments to detect contamination.

(b) Control dust by use of engineering controls (i.e., eliminating dry sweeping and by filtered ventilation systems). If vacuum cleaners are used, they must be equipped with High Efficiency Particulate Air (HEPA) filters capable of removing 99.97 percent of particulate 0.3 micron. or greater.

(c) Work areas shall be designed to limit the spread of contamination and to facilitate decontamination by using smooth work surfaces with replaceable coverings (e.g., disposable absorbent paper).

(d) Anti-contamination clothing such as coveralls, gloves, caps, and shoe covers shall be used to protect the skin, hair or personal clothing. Anti-contamination clothing shall be marked and labeled for purpose of control, e.g., monitoring, decontamination, and laundering.

(e) Containment of contaminated items or surfaces to prevent cross-contamination or the spread of contamination through use of plastic bags, glove bags, etc.

(f) Use of appropriate respiratory protective equipment.

D. PERSONNEL TRAINING

1. All personnel handling radioactive items shall be trained, as required, by paragraph E5, of this instruction and in accordance with Service or Agency directives and Federal regulations.

2. Service-specific sources of training in radiation safety can be obtained from the following:

(a) Department of the Army. Courses are announced in DA Pamphlet 350-10, U.S. Army Formal School Catalog. A separate circular announces training courses conducted by the Surgeon General, Army Materiel Command.

(b) Department of the Air Force. Radiological safety is included in courses taught by U.S. Air Force School of Aerospace Medicine, Brooks AFB, TX. Additional information is contained in AFCAT 36-2223.

(c) Department of the Navy. Naval Sea Systems Command Detachment, Radiological Affairs Support Office (RASO), NWS PO Drawer 260, Yorktown, VA 23691-0260. Radiation safety Training is limited to training individuals as Radiation Safety Officers. Radiation safety training does not include "use" of radioactive material.

3. All emergency and security personnel shall be trained and equipped to manage the radiological hazards that may be encountered in the performance of their duties.

E. RADIOLOGICAL EMERGENCIES

1. General. Radiological emergency response actions shall be in accordance with Service or Agency directives.

(a) The prime objectives of emergency action are the preservation of life and limbs and protection of personnel from radiation hazards. The secondary consideration should be the confinement of the contamination to the local area of the incident. No standard rules are available to handle every conceivable incident. The guidance furnished below will minimize the risk/danger to personnel who may have been contaminated or overexposed. These individuals shall be transferred to an area where decontamination and medical assistance can be afforded.

(b) Contingency plans shall be developed in anticipation of radiological emergencies, in order to minimize exposure of personnel and to control the spread of contamination. These plans shall be written, coordinated, and rehearsed in accordance with Service or Agency directives. The plan shall include all support organizations (fire, police, medical, maintenance, repair, damage control, and public information personnel) and transport carriers or ships to which the material is being tendered for transport, as applicable. Particular procedures in the plan for any supply and maintenance activity shall depend upon the quantity and types of radioactive items that are stocked.

(c) Fire among or near radioactive items might produce airborne radioactive hazards. A prospective hazard analysis shall be performed by qualified personnel to estimate the potential risk from fires and the necessary emergency actions to determine the need for (and distance of) downwind evacuation. These analyses shall be updated as required based on changing meteorological conditions.

(1) Firefighting operations might disperse radiological material into an area which is not initially part of the incident site. The draining of liquids from firefighting operations should be properly managed and, when necessary, avoided by personnel, unless impermeable protective clothing is worn. Additional measures must be taken, as necessary, to cope with any resultant hazards.

(2) A perimeter cordon and controlled entry area shall be established as soon as possible to prevent access of unauthorized personnel. Size of perimeter cordon or method of controlled entry shall be dependent upon the radiological or other health hazard associated with the radiological emergency. All personnel leaving the control area shall be monitored and decontaminated, if necessary. Contaminated equipment, clothing and debris will be decontaminated or packaged and disposed of in accordance with Service or Agency instruction. No smoking, eating, or drinking shall be permitted within the perimeter.

(d) When personnel are seriously injured, all other considerations (except fire, explosion, and atmospheres immediately dangerous to life) shall become secondary until urgent medical aid is given and assistance for rescue (if necessary) and evacuation are summoned. Unless there is a high risk to health, no injured or unconscious individual shall be evacuated until: bleeding has been controlled; breathing is normal; the possibility of fractures has been assessed; and required medical treatment is afforded.

(e) As soon as the immediate emergency is under control, a detailed radiological survey shall be conducted by a qualified individual, to characterize the potential radiological hazard. Release calculations of radioactive material into the environment, from either liquid or airborne, shall be performed. Priorities will be assigned to decontamination parties working in contaminated areas and those areas requiring control by a trained radiological monitor. Assistance from outside source(s) may be required.

2. Emergency Actions

(a) Emergencies will generally be in the nature of spills, fires, or explosions, by which radiological material can be dispersed or released. In case of emergency, the following actions shall be taken:

(1) In the event of a fire, explosion, spill, or hazardous malfunction, attempt to stop the cause (if applicable) and notify all persons to evacuate the area at once.

(2) Notify the fire, police, and medical personnel, if appropriate, indicating involvement of radioactive items and/or materials.

(3) Notify the Radiation Safety Officer (RSO) and immediate supervisor.

(4) Shut off heating and air conditioning equipment (as applicable) if the potential for airborne contamination is present to prevent the spread of contamination.

(5) If properly trained, personnel may attempt to extinguish fires if radiological hazards are not immediately present.

(6) Monitor all persons and equipment involved in the emergency and control actions to minimize possible contamination.

(7) Monitor the area and determine the protective clothing required for safe decontamination. The RSO will be available for this determination.

(8) Accidents or incidents involving radioactive items shall be investigated and reported in accordance with Federal regulations and applicable Service or Agency directives.

(9) Isolate the areas to prevent unnecessary personnel from entering.

(10) Take actions to minimize personnel exposure to the extent practical.

(b) The installation commander or his representative shall notify local, county, or state authorities of the emergency as deemed necessary.

F. EMERGENCY ASSISTANCE

1. Emergency notifications and requests for assistance will be made in accordance with applicable Service or Agency directives.

2. Assistance, beyond local capability in responding to an emergency shall be delineated in the emergency plans and standard operating procedures and shall be requested through appropriate channels.

(a) For Defense Logistics Agency: HQ DLA, CAAE, 8725 John J. Kingman Road, Suite 2639, Fort Belvoir, VA 22060-6221; commercial 703-767-6231, DSN 427-6231; commercial, after duty hours, Staff Duty Officer, 703-767-6666, DSN 427-7000.

(b) For Department of the Army: HQ USAMC, 5001 Eisenhower Avenue, ATTN: AMCSF-P, Alexandria VA, 22333-0001; commercial 703-617-9340, DSN 767-9340; commercial, after duty hours, Staff Duty Officer 703-617-9223, DSN 767-9223

(c) For Department of the Navy: Naval Sea Systems Command Detachment, Radiological Affairs Support Office (RASO), Yorktown, VA 23691-5098, DSN 953-4692, commercial 757-887-4692, Telefax 757-887-3235, Message Address: NAVSEA DET RASO YORKTOWN VA//00//.

(d) For Department of the Air Force: DET1, HSC/OEBZ, 2402 E Drive, Brooks AFB, TX 78235-5000, DSN 240-3486, commercial 210-536-3486.

(e) For United States Marine Corps: HQMC (SDM-5), 2 Navy Annex, Washington, DC., 20380-1775, DSN 224-3164, Commercial (703) 614-3164, Telefax (703) 695-3231.

G. RECOMMENDED RADIOACTIVE CONTAMINATION ACTION LIMITS AND LEVELS. Radioactive contamination action limits and trigger levels will be in accordance with Federal guidance and applicable Service or Agency directives.

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LOGISTICAL CONTROLS AND SPECIFIC HANDLING

A. GENERAL. This section provides DoD guidelines applicable to: transportation; packaging; shipping; receiving; storage areas; inventory of items at supply facilities; logistical activities.

B. TRANSPORTATION OF RADIOACTIVE ITEMS. Radioactive Items shall:

1. Be transported in accordance with applicable Federal regulations, International Atomic Energy Agency guidance and Service or Agency directives (A list of applicable regulatory guidance is contained in paragraph A of this instruction). Policy requires that radioactive items or material:

a. Be cargoed with other compatible freight in accordance with Federal regulations for transportation of radioactive material.

b. Not be cargoed in the same vehicle, compartment or aircraft with shipments of food products, animals, Classes 1.1 and 1.2 explosives or pyrotechnic materials (be segregated per 49 CFR).

c. Be separated from photographic film and supplies to prevent possible damage.

d. Be escorted, when required, by individual(s) technically qualified and properly equipped (RADIAC meters) to ensure a high degree of safety and security for the shipment.

C. PACKAGING. Packaging containing radioactive material shall:

1. Be marked, labeled, and certified in accordance with the applicable documents listed in paragraph A of this instruction and Service or Agency directives.

2. Be repackaged, when required, in accordance with the regulations or directives cited in enclosure 2, paragraph A, of this instruction, and Service or Agency directives. The original container shall be opened and the item carefully repacked and monitored.

3. Be performed in a designated area, including radiation monitoring if required, under the supervision of qualified radiation safety personnel.

4. Be resealed or repackaged under the supervision of qualified radiation safety personnel when packaging deficiencies or damage containers in transit are observed. One of the following forms listed below shall be prepared:

(a) Standard Form (SF) 364, Report of Discrepancy (ROD) (DLAR 4140.55/AR 735-11-2/NAVMATINST 4355.73B/AFJMAN 23-215/MCO 4430.3).

(b) SF 361, Transportation Discrepancy Report [DoD 4500.9-R, Defense Transportation Regulation].

D. SHIPPING ACTIVITY RESPONSIBILITIES. Any Service or Agency licensee or designated representative authorizing a shipment(s) of radioactive items shall:

1. Verify the recipient is authorized to receive licensed radioactive items. This action shall be performed by the Services' Inventory Control Point(s) or Item Manager(s).

2. Ensure shipping documents for radioactive items are prepared in accordance with Title 49, CFR, Part 172, and DoD 4500.9-R, Part II Cargo, Chapter 204. The type of radioactive item and the degree of control may require preparation and submission of additional documentation for in-transit control.

3. Ensure all shipments containing radioactive items are inspected for damage, leakage, and monitored for radiation and contamination before offered to a carrier.

4. Ensure all shipments of radioactive items are properly packed, marked, labeled and certified. Ensure the following emergency response number is annotated on the shipping document, as applicable, "For DoD Radioactive Material Only: Call (309) 782-3510 - Collect. Ask for STAFF DUTY OFFICER.", in accordance with DoD 4500.9-R, Part II, Chapter 204.

E. RECEIVING ACTIVITY RESPONSIBILITIES. The Service or Agency authorized to receive, store and issue radioactive items and devices shall accept control in accordance with Title 10, CFR and applicable NRC license(s) and Service or Agency authorization(s). To ensure the Service and Agency maintains compliance with Title 10, CFR and achieves the purpose for which their license(s) and authorization(s) are issued, the following shall apply:

1. Identification. Radioactive items and devices shall be properly identified. Identification of radioactive items, whether assembled as a component of a stock numbered item or as a separate component, spare part, or other item, shall be accomplished to provide for the uninterrupted flow of material among the using, storage and maintenance activities. Items shall be capable of being tracked in automated systems that support their respective function and shall contain logistics item identification data from enclosure 2, paragraph E3 of this instruction. Failure to identify radioactive items can lead to unnecessary employee radiation exposures and noncompliance. If this happens, the receiving activity shall notify the shipping activity.

2. Receiving

a. Services or Agencies shall receive items of supply containing serviceable radioactive material into storage and for distribution purposes. Unserviceable radioactive material is the responsibility of the Services or Agencies and should not be returned to storage. Serviceable items include:

- (1) Items that are ready for issue or use.
- (2) Items determined by the item manager to be in a condition that meets repair criteria.
- (3) Items that are not condemned.
- (4) Type I shelf-life items that are not expired and have sufficient remaining shelf-life for further usage.
- (5) Type II shelf-life items that are not expired or can be extended.
- (6) Items that are not classified as waste, including generally licensed and license exempt radioactive material.

b. Guidelines for receiving radioactive items shall include one or more of the following criteria:

- (1) Verify the condition code classification of the item and device being received is accurate and consistent with the receiving policy of the Distribution Depot(s).
- (2) Verify, when accessible or by visible inspection, the radioactive source is intact in its holder, module or component and is not leaking.
- (3) Perform radiation surveys on all items and devices with Department of Transportation hazard warning labels of White I, Yellow II and Yellow III.
- (4) Conduct radiation surveys on all items and devices suspected of potentially containing radioactive material.

3. Disassembly and Demilitarization. Defense Distribution Depots will not engage in any act or process of disassembly or demilitarization of any items containing radioactive material. This includes activities such as opening any sealed source or detector cell containing radioactive material, removal of any radioactive material from its source holder, module or components; or removal of a module, holder or component from its assembly or end item. Written approval or authorization shall be obtained from the owning or managing Inventory Control Point (ICP) prior to the Service or Agency engaging in any such activities and shall be authorized by NRC License(s) or Service or Agency directives. Accordingly, the following guidelines shall apply:

a. Prolonged storage of radioactive material, which is a component of an assembly or end item (e.g., muzzle reference sensors, fire control devices and night vision devices), and not designed against natural elements, action must be taken to obtain disassembly guidance and assistance from the owning or managing ICP. Accordingly, approval must be obtained to store it separately. As necessary, the Defense Distribution Depots should seek the assistance from the Military Service Maintenance Activities or other appropriate sources to

physically disassemble the radioactive material module or matrix from its assembly or end item.

b. When disassembly of the radioactive material holder, module or component is impractical, the following shall apply:

(1) Ensure the radioactive material holder, module or component is properly identified with the major assembly or end item.

(2) Ensure the radioactive item or device is safe for handling and storage.

(3) Ensure radioactive items or devices, as part of an assembly or end item, are tracked in accordance with NRC license requirements.

(4) Ensure radioactive items or devices are monitored in storage in accordance with Title 10, CFR and NRC license requirements.

c. Failure to remove radioactive components from their assembly or end item prior to storage can increase the risk of degradation to the radioactive source, thereby leading to potential leakage contamination and exposure to defense personnel. Therefore, Defense Distribution Depot personnel are encouraged to obtain approval and proper guidance from the Military Services to achieve separate storage and control of radioactive items that are part of an assembly or end item.

4. Handling Repairables. Defense Distribution Depots shall accept assemblies and end items with radioactive components that are determined by the item manager to be in a condition that meets the repair criteria. Items and devices that do not meet the repair criteria shall be considered potentially unserviceable and will require immediate disposition action. These actions include obtaining from the managing ICP a valid justification for continued storage, or approval for the immediate removal of such items from the facility. The following applies to items accepted for storage:

a. The managing ICP(s) shall provide the Defense Distribution Depots a conversion time schedule for each radioactive reparable in storage and ensure the most current maintenance records are available for review. Disassembly and demilitarization above shall apply to reparable items in storage.

b. Repairables containing radioactive materials should be scheduled for conversion in the following priority and IAW NICP and/or Service or Agency directives:

(1) Priority I. Items containing licensed radioactive material.

(2) Priority II. Items containing generally-licensed radioactive material.

(3) Priority III. Items containing license-exempt radioactive material.

c. The condition code of a reparable may not reflect the condition of its radioactive component(s). Therefore, any serviceable radioactive item which is a part of an unserviceable assembly or end item may be stored at the Defense Distribution Depots as a serviceable component, and the inventory records shall be maintained to reflect this storage.

F. STORAGE AREAS. Storage of radioactive items shall:

1. Be in accordance with Service or Agency regulations and directives and the general requirements specified in this section. Radioactive material storage areas shall be consolidated to the extent possible to enhance the control of radioactive material.

2. Be stored and segregated IAW TM 38-410/NAVSUP PUB 573/AFR 69-9/MCO 4450-12/DLAM 4145.11, Storage and Handling of Hazardous Material. Radioactive material shall not be stored in the same warehouse section with explosives, flammable materials, photosensitive items (e.g., photographic film), food

products or other incompatible items unless provided for and approved by the appropriate Service or Agency.

3. Be stored in an adequately ventilated facility especially items containing radioactive gases in sufficient quantity capable of generating a potential airborne radioactive area, and/or radium.

4. Require measures to control access or removal of items from open stored areas. Open storage, as defined in this instruction, shall be used only when:

(a) The radioactive component is authorized for open storage under the conditions of the license and Service or Agency authorization.

(b) The radioactive component is designed to withstand local outdoor storage conditions.

G. INVENTORY OF ITEMS AT STORAGE FACILITIES. The Material Inventory Control Points (ICPs) or the individual specified by the NRC License or Service Authorization, in cooperation with personnel at storage facilities, shall:

1. Maintain inventory records identifying radioactive items. These records shall be maintained at each supply and stocking facility. The following information shall be included in the record: transaction data; NSN; Hazard Characteristic Code (HCC); radionuclide(s); chemical and physical form; original radioactivity [e.g., millicuries (mCi), microcuries (uCi), Bq] per item and date determined; storage location; number of items received and transferred; document number of shipment or receipt; balance of items at conclusion of the transaction; and the license or authorization number.

2. Conduct a physical inventory in accordance with Federal regulation(s), NRC license(s) or Service/Agency authorization(s) to ensure accuracy of inventory records. Containers shall not be opened for this purpose. Any discrepancies noted will be provided to the inventory organization for further count and adjustment of records, as appropriate. Discrepancies of specifically licensed items shall be reported to the RSO and reviewed for reportability.

3. Utilize an automated inventory program for radioactive items in cooperation with the appropriate storage activity. This automated program shall have the following minimum capabilities, as applicable:

(a) Print capability for radioactive items in storage. Each item shall be identified by NSN; HCC; name; quantity; radionuclide; radioactivity; location; condition code and total radioactivity by radionuclide(s). Printout shall be available upon request.

(b) Retain all NSNs records (manual or automated) for radioactive items life cycle in DoD supply system. Although stock levels may be zero, access to specific data is required to process the return and ultimate disposal of the item.

(c) Coding to identify unauthorized or obsolete radioactive items.

(d) Mechanisms to update or correct information.

4. Report any loss of radioactive items in accordance with instructions and control information for that item, and as required by Federal regulations and Service or Agency directives.

H. CONTROL AND SURVEYS OF STORAGE AREAS FOR RADIOACTIVE ITEMS. The Service or Agency responsible for storage of Radioactive Items shall:

1. Implement and enforce procedures for performing work in Radiation area(s) to maintain radiation exposures as low as reasonably achievable (ALARA).

2. Post storage location(s) for radioactive items in accordance with the provisions of Title 10, CFR, Part 20.

3. Secure radioactive items from unauthorized removal by controlling access to licensed materials stored in controlled or unrestricted areas and maintain constant surveillance over licensed material in controlled or unrestricted areas not considered in storage.

4. Ensure radiation surveys are accomplished and the frequency of radiation surveys is based on radioactive item inventory, radioactive characteristics, stock activity, warehouse operation, NRC license requirements and guidance prescribed in technical literature. Results of surveys shall be reported to supervisors, to include any recommendations for corrective actions. Survey records shall be maintained in accordance with 10 CFR, Federal regulations and Service or Agency directives. At a minimum, the survey report will include the results, the radionuclide or type of radiation emitted, instruments used including serial number and serial number of the probe, the calibration date of survey instrument used, name of surveyor, signature of surveyor, the date and time the survey was taken, reason for survey, location, a remarks section, and the corrective actions taken, and date(s) completed. Survey results shall be reported to the supervisor(s), to include the recommendations for corrective actions, as necessary.

5. Ensure the RSO (Radiation Safety Officer)/RPO (Radiation Protection Officer):

(a) Identifies and determines the location(s) and extent of radioactive contamination and radiation levels, appropriateness of boundaries, signs, markings, and protective equipment and procedures.

(b) Complies with radiation exposure limits established by Federal Regulations and Service or Agency directives..

(c) Identifies problems and determines corrective actions required to protect personnel, property and comply with this instruction.

6. Ensure closeout radiation surveys, when required, are performed and documented for all locations where operations involving storage of radioactive items have terminated. Closeout surveys shall be accomplished prior to the release of area(s) for unrestricted use. Release criteria shall meet the Federal and State regulations and Service or Agency directives for unrestricted use.

7. Ensure records are maintained as required by Title 10, CFR, Part 30 for decommissioning purposes and in accordance with Service or Agency directives.

I. MAINTENANCE. The Service or Agency responsible for Maintenance Operations shall ensure

1. Maintenance authorized by maintenance allocation charts is performed and maintenance allocation charts are available for review.

2. Maintenance is performed only by DoD elements and contractors authorized by an NRC and Agreement State license or Service or Agency authorization. Prior to maintenance, the DoD element shall have facilities, trained personnel, radiation detection and monitoring equipment, and operating procedures to ensure adequate protection of personnel.

3. Radiation surveys are accomplished in accordance with applicable Federal regulations and Service or Agency directives for all maintenance operations involving radioactive items.

4. Assembly and repair areas are surveyed by radiological safety personnel at frequencies specified in accordance with Federal regulations, NRC License(s) and Service or Agency directives. The frequency of radiological surveys shall be determined by the type of maintenance in work areas.

J. SURVEILLANCE. Surveillance procedures and testing shall be conducted as specified in life cycle control and as required by the appropriate Service or Agency. The Inventory Control Point will ensure accomplishment of required surveillance and will report results to the cognizant NRC licensee or Service or Agency Authorization Manager.

K. POSTING AND LABELING. Posting and Labeling of radioactive material areas and containers shall:

1. Include warning signs designating radioactive material areas, radiation areas and high radiation areas and be posted conspicuously at each entrance and other locations surrounding such areas clearly identifying the hazard that exists within the area. Signs, either permanent or temporary, shall be securely fixed to the barriers, walls, fences, or ropes. Installations or activities located where non-English languages are prevalent shall post signs that include a translation into appropriate languages.

2. Include storage locations of radioactive items and be posted in accordance with Title 10, CFR, Part 20, Federal regulations and Service or Agency directives.

3. Be in accordance with the provisions of applicable standards and Federal regulations and Service or Agency directives. Labeling of containers shall indicate radioactive material as required by Federal regulations, Service or Agency directives throughout the DoD supply system. Some labeling modification may be authorized to comply with conditions not covered specifically in this directive.

4. Be posted where a high radiation area exists in accordance with 10 CFR, Service or Agency directives or other Federal regulations.

5. Obtain guidance, if required, from the appropriate Service or Agency offices listed below:

(a) Defense Logistics Agency: HQ DLA, CAAE, Fort Belvoir, VA 22060-6221.

(b) Department of the Army: HQ USAMC, ATTN: AMCSF-P, Alexandria, VA 22333-0001 and AR 385-30.

(c) Department of the Navy: Naval Sea Systems Command, Detachment, Radiological Affairs Support Office, Yorktown, VA 23691.

(d) Department of the Air Force: HQ AFMOA/SGOR, 8901 18th St., Brooks AFB, TX 78235-5000.

(e) United States Marine Corps: Commandant of the Marine Corps, ATTN: Code SDM-5, 2 Navy Annex, Washington, DC 20380-1775.

L. CALIBRATION OF RADIAC SURVEY METERS. RADIAC survey meters shall be calibrated at intervals established by Federal regulations, NRC license

conditions and Service or Agency directives and shall be performed by an accredited and licensed (i.e., NRC or Agreement State) or Service or Agency authorized laboratory.

M. DISPOSAL. The Service or Agency shall:

1. Screen radioactive items in accordance with Federal Property Management Regulations (FMPR) 101-14.1 and FPMR C-24; Title 41, CFR, Part 101-42, Utilization and Disposal of Hazardous Materials and Certain Categories of Property; 41 CFR 101-43, Utilization of Personnel Property and DoD 4160.21-M, Defense Materiel Disposition Manual.

2. Identify components on all turn-in documents of the end item(s) containing radioactive material.

3. Not turn-in radioactive items or material to Defense Reutilization and Marketing Office(s) (DRMOs). Item(s) controlled by an NRC or Agreement State license shall require the Agency and/or Licensee to state, in writing, on the Disposal Release Order, that the transfer, sale, or donation is restricted to LICENSED recipients only.

4. Ensure radioactive items processed for reutilization, transfer, donation, recycle, or sale are labeled in accordance with appropriate standards and are within contamination limits specified in Federal regulations and Service or Agency directives.

5. Ensure Radioactive items are not physically transferred to a DRMO, but retained by the owning activity until shipping instructions are received from the DRMO (DoD 4160.21-M, Chapter 4, paragraphs B53, B54 and B55) unless otherwise authorized by this instruction.

6. Ensure items containing RADIUM are not transferred to a DRMO, but are disposed of in accordance with DoD and Service or Agency directives.

7. Ensure radioactive items, which cannot be economically reutilized, transferred, donated, recycled, reclaimed or sold are disposed of in accordance with Federal regulations and Service or Agency directives.

8. Ensure unserviceable items and items that cannot be adequately decontaminated and/or repaired are not turned-in to a DRMO. These items shall be disposed of as radioactive waste in accordance with Federal regulations and Service or Agency directive. All radioactive items that have been reported to and screened by the DRMO and determined to be unsuitable for reuse, resale or recycling shall be disposed of as radioactive waste.

9. Ensure excess or surplus items, containing radioactive material, are disposed of IAW applicable licenses, Service authorizations, Inventory Control Points requirements.

10. Ensure all radioactive waste is disposed in accordance with the Federal regulations and Service or Agency directives and licensed burial site criteria as applicable.

11. Be responsible for costs associated with disposing of radioactive items and actions taken for the purposes of radioactive source removal or volume reduction.

12. Ensure serviceable LICENSE EXEMPT items containing radioactive material are disposed of in accordance with normal reutilization, transfer, donation, sales, recycle or reclamation procedures as prescribed in DoD 4160.21-M. Serviceable end items that cannot be reutilized, recycled, reused, reclaimed, transferred, donated or sold shall have the radioactive item or component removed as required by the Service or Agency and be disposed of in accordance with Federal regulations and Service or Agency directives. Unless indicated by Federal regulations and Service or Agency directives, license exempt items not incorporated into end items or equipment shall be subject to normal reutilization screening procedures as prescribed in DoD 4160.21-M, Chapter 4, paragraphs B23, B54 and B55. These items shall not be physically moved to a DRMO. License exempt items that cannot be sold, donated, utilized, recycled or transferred will be disposed in accordance with Federal regulations and Service or Agency directives.

13. Ensure SERVICEABLE LICENSED (Specific or General) items containing radioactive material are reutilized, transferred, donated, recycled, or sold only to persons authorized by a valid NRC or Agreement State license and/or Service authorization. The owning activity will develop and implement procedures to ensure screening procedures are performed on items in accordance with standard reutilization, transfer, sale and donation requirements. Sales service shall be provided by a DRMO as required on a case by case basis. If the items cannot be reutilized, transferred, donated, or sold, they will be disposed of by the Service or Agency as radioactive waste in accordance with Title 10, CFR, Part 20 and Service or Agency directives. The Service or Agency will ensure that the radioactive material is removed from the end item(s) in accordance with their NRC License or Service or Agency directive(s). These items will neither be physically moved to a DRMO nor will they be accepted on the accountable records of a DRMO.

N. Radioactive Waste. The Service or Agency shall ensure the disposal of radioactive material is in IAW the DoD Charter for Low-Level Radioactive Waste Disposal [Deputy Under Secretary of Defense (Environmental Security) directives], Title 10, Code of Federal Regulations and burial site criteria, if applicable. Excess or surplus items containing radioactive material shall be disposed of when the license(s) or Service authorization(s) require, or when the Inventory Control Point or owning activity determines that any other method of disposal is not in the best interest of the Government.