National Guard Regulation 385-24

Safety

The Army National Guard Radiation Safety Program

National Guard Bureau
Arlington, VA 22202-3231
2 May 2011

UNCLASSIFIED

SUMMARY of CHANGE

NGR 385-24
The Army National Guard Radiation Safety Program
2 May 2011

- Clarifies the use of safety councils and committees.
- Establishes review and approval procedures for integrating Composite Risk Management (CRM) in accordance with (IAW) FM 5-19 and DA Pam 385-30.
- Outlines policies when deviating from Army Radiation Safety Program requirements.
- Provides notification requirements when an RSO is not appointed for an ICRI.
- Sets notification requirements for all facility decommissioning actions involving RAM.
- Defines disposal requirements for radioactive sources found in foreign material(s).
- Adds the requirements for the designation of a Unit RSO (URSO) for units that use/store licensed radioactive commodities or radiation-emitting equipment that requires the implementation of a Radiation Safety Program.
- Updates/clarifies requirements for equipment possessed under a General License.
- Updates/clarifies requirements for X-ray machines and ionizing radiation-producing devices.
- Identifies exceptions to radiological postings requirements.
- Defines personnel radiation, occupational ionizing radiation exposure standards.
- Clarifies compliance guidance for radio-frequency safety programs to include: training; medical surveillance; exposure limits; posting requirements; and accident reporting requirements.
- Outlines initial and refresher training requirements for Radiation Safety Officers.

National Guard Bureau ***NGR 385-24**
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The Army National Guard Radiation Safety Program

By Order of the Secretary of Defense:

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General, USAF
Chief, National Guard Bureau

Official:

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Chief, Strategy and Policy Division

History. This publication supersedes NGR 385-11, 18 February 1999.

Summary. This regulation prescribes Army National Guard Bureau (NGB) radiation safety policy as it relates to the use, licensing, disposal, transportation, dosimetry, accident reporting, inventory control, and radiation exposure standards for ionizing and non-ionizing radiation sources and equipment. This regulation implements Army Regulation (AR) 385-10, and DA Pamphlet 385-24, as well as the requirements set forth in the Code of Federal Regulations (CFR) and Department of Defense (DOD) safety regulations and guidelines. This regulation prescribes Army National Guard (ARNG) authority as it pertains to radiation safety.

Applicability. This regulation applies to all ARNG commands, units, facilities, activities and personnel that use, store, handle, maintain, transport, or dispose of radioactive materials/ionizing radiation-producing devices or use/maintain laser and/or radiofrequency (RF) radiation-producing devices. This regulation also applies to any non-ARNG organization that requests authorization to store or use radioactive materials/ionizing radiation-producing devices or laser/RF radiation-producing devices on ARNG property or under ARNG control.

Proponent and exception authority. The proponent of this regulation is the Chief, ARNG-ILL. The proponent has the authority to approve exceptions or waivers to this regulation that are consistent with controlling law and regulations. The proponent may delegate this approval authority in writing, to a division chief with the proponent agency or its direct reporting unit or field operating agency, in the grade of Colonel or equivalent. States may request a waiver to this regulation by providing justification that includes a full analysis of the expected benefits, and must include formal review by the States senior legal officer. All waiver requests will be endorsed by the Adjutant General or senior leader of the requesting State and forwarded through higher headquarters to the policy proponent.

Management Control Process. This regulation is subject to the requirements of AR 11-2. It contains internal control provisions but does not contain checklists for conducting internal control reviews.

Supplementation. Supplementation to this regulation is prohibited without prior approval from NGB, ATTN: ARNG-ILL-M, 111 South George Mason Drive, Arlington, VA 22204-1382.

Suggested Improvements. Users should submit comments and suggested improvements on DA Form 2028 (Recommended Changes to Publications and Blank Forms) to Army National Guard Readiness Center, ATTN: ARNG-ILL-M, 111 South George Mason Drive, Arlington, VA 22204-1382.

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Appendixes

Glossary

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Chapter 1
General Provisions

1-1. Purpose
This regulation sets policy, responsibilities and procedures for the licensing, control, possession, use, storage, transportation, and disposal of radioactive material and radiation-producing devices within the ARNG. In addition, it establishes personnel safety policies and responsibilities during the operation and maintenance of Radio Frequency (RF) and optical/ laser non-ionizing radiation-producing equipment within the ARNG.

1-2. References
Required and related publications are listed in Appendix A.

1-3. Explanation of abbreviations and terms
Abbreviations and terms used in this regulation are explained in the glossary.

1-4. Responsibilities
a. Federal regulatory agencies. The following Federal agencies regulate radioactive material and ionizing radiation-producing devices possessed and used by the ARNG:

(1) The U.S. Nuclear Regulatory Commission (NRC). The NRC is responsible for licensing and enforcing the use of licensed radioactive material. NRC regulations are contained in Title 10, Code of Federal Regulations (CFR). The address and telephone number of the NRC Regional Office for your area is listed on NRC Form 3, Notice to Employees.

(2) The U.S. Department of Transportation (DOT). The DOT regulates the movement of radioactive material in interstate commerce by rail, water, air, and public highway (except the U.S. mail). DOT regulations are contained in Title 49 CFR.

(3) U.S. Postal Service (USPS). The USPS regulates the transit of radioactive material in the U.S. mail. Postal requirements for hazardous material are published in USPS Publication 52.

(4) The Food and Drug Administration (FDA) regulates the manufacture of equipment and radiation-producing devices (e.g., laser, x-ray optical, microwave). For most electronic products that emit radiation, safety regulation is divided between the FDA and individual State regulatory agencies.

(5) The International Air Transport Association (IATA) publishes Dangerous Goods Regulations in order to provide procedures for the shipper and the operator by which articles and substances with hazardous properties can be safely transported by air on all commercial air transport.

b. National Guard Bureau (NGB) will ensure that:

(1) IRSP and NIRSP programs are supported with adequate budgetary and manpower resources, facilities, equipment and procedures necessary to facilitate effective RSPs within the ARNG.

(2) A Radiation Safety Staff Officer (RSSO) is designated in writing.

(3) A Radiation Safety Committee (RSC) is established to serve as an advisory body to HQ NGB by providing recommendations for radiation safety directives and policy and disseminating information within the command. The RSC should meet at least semi-annually and at the call of the chair. The RSSO may not serve as the chair.

(4) Review and approval procedures are established for integrating Composite Risk Management (CRM) in accordance with (IAW) FM 5-19 and DA Pam 385-30. Ensure that the CRM process is executed before the conduct of all radiation operations.

(5) Authorized deviations from Army Radiation Safety Program requirements are accomplished IAW DA Pam 385-24, para1-10, with concurrence from the RSSO.

c. The ARNG RSSO will:

(1) Ensure implementation of Army and ARNG radiation safety policy IAW AR 385-10, DA Pam 385-24 and this regulation. Ensure ARNG facilities and activities are audited to demonstrate compliance with NRC licenses/ARAs and DOD/Federal regulations.

(2) Establish and direct NGB RSP policy/criteria requirements to ensure that NGB compliance with life cycle management controls incorporated in NRC licenses, ARAs, and Federal and DOD regulations regarding DOD radioactive items and ionizing/ non-ionizing radiation-producing devices.

(3) Serve as technical advisor and Major Command (MACOM) Radiation Safety Point of Contact (POC) to NGB for all DOD radioactive items of supply, NRC generally-licensed items, and ionizing/non-ionizing radiation-producing devices used by ARNG States/Territories.

(4) Provide technical guidance and assistance to ARNG personnel who receive, use, store, handle, maintain, transport and dispose of radioactive material and ionizing radiation-producing devices and/or laser and RF radiation-producing equipment.

(5) Provide radiation safety training to qualify ARNG personnel that utilize, or oversee the use of, radioactive items and ionizing/non-ionizing radiation-producing devices.

(6) Provide for calibration and repair of ionizing radiation detection instruments used to support the safety program.

(7) Provide radiological analysis laboratory services for analysis of the radioactive isotopes used by the ARNG. These services include, but are not limited to, source leak tests, radioactive package shipment release, and low level contamination detection.

(8) Approve Army Radiation Authorizations (ARA) IAW AR 385-10 and DA Pam 385-24.

d. The Adjutant General (TAG) of each State/Territory will:

(1) Establish written policies and procedures to ensure compliance with applicable Federal, DOD, and DA radiation safety regulations and directives. These documents will include emergency reaction plans as necessary and procedures for investigating and reporting radiation accidents, incidents, and over-exposures.

(2) Provide and maintain adequate resources and facilities to ensure safety of personnel, property, and the environment.

(3) Designate, in writing, qualified personnel to serve as State Radiation Safety Officer (SRSO) and Alternate SRSO (ASRSO) to establish and direct the RSP consistent with Federal, DA and ARNG regulations. This position may be assigned to anywhere within the organization; however, the SRSO must have direct access to the Chief of Staff to ensure that radiation safety is given priority. If desired, the responsibility for the NIRSP may be separated from that of the IRSP by the appointment of a Laser Safety Officer (LSO) and/or an RF Safety Officer (RFSO).

(4) Ensure that licensed or other authorized radioactive material is used IAW applicable Technical Manuals (TM) and, where required, only under the authority of trained RSOs and not transferred to unauthorized recipients or organizations.

e. The State Radiation Safety Officer (SRSO) will:

(1) Meet the training requirements as specified in Appendix E.

(2) Manage and direct the State's RSP and ensure that radioactive items are handled IAW this regulation as well as DA and NRC regulations. Where RSP inadequacies or radiation safety issues require command attention for resolution, advise the commander through locally established channels.

(3) Ensure that Local Radiation Safety Officers (LRSO) are appointed to oversee the use of Individually Controlled Radioactive Items (ICRI), see Appendix B. Ensure that the Chief of Staff is notified when a qualified RSO is not appointed for an ICRI.

(4) Ensure the appointment and qualifications of each LRSO and Alternate LRSO (ALRSO), Laser Safety Officer (LSO) and Radiofrequency Safety Officer (RFSO).

(5) Ensure that radiation safety training is performed and documented, as specified in Appendix E, to include:

(a) Initial an annual refresher training for ionizing radiation workers issued dosimetry. Training includes safe work procedures, emergency procedures, harmful effects of radiation over-exposures, and other topics required by Title 10 CFR Part 19.

(b) Radiation safety awareness training for personnel utilizing radioactive sources/commodities, IAW license requirements.

(c) Ensure that appropriate safety training is conducted for personnel who use or maintain non-ionizing radiation-producing equipment capable of exceeding the Maximum Permissible Exposure (MPE) prior to their becoming authorized users. To determine whether equipment exceeds the MPE, refer to Technical Bulletin (TB) 43-0133 or the appropriate TM.

(6) Annually review and sign the consolidated State/Territory radioactive materials inventory. The United State Property and Fiscal Office (USP&FO) Property Book Officer and/or RSSO shall provide the SRSO reports of all accountable property identified as containing radioactive material.

(7) Ensure that a personnel dosimetry program is established IAW AR 385-10, DA Pam 385-24, and DA Pam 40-18 at each unit, facility or activity, for personnel who have the potential to receive 10% of the annual dose limit or as required by an NRC license.

(8) Immediately report to the ARNG RSSO, any incident / accident involving the theft, loss, damage, etc., of any radioactive commodity. Review and coordinate investigations pertaining to reports of accidents/incidents involving radioactive materials and commodities, ionizing radiation-producing equipment, and/or laser/RF systems.

(9) Notify the RSSO of all facility decommissioning actions involving RAM. Provide copies of all radiation controlled area(s) close-out documentation to the RSSO.

(10) Identify and properly dispose of radioactive sources in foreign material to prevent inadvertent radiation hazards and radioactive contamination.

f. The Alternate State Radiation Safety Officer (ASRSO) will assist the SRSO in the management of the RSP. In the absence of the SRSO, the ASRSO will assume the RSP responsibilities and duties of the SRSO. Qualifications and requirements of the ASRSO are the same as those required for the SRSO.

g. Commanders/Supervisors will:

(1) Designate, in writing, qualified individuals to serve as LRSOs and ALRSOs, as applicable.

(a) LRSOs are required to be appointed on orders for Individually Controlled Radioactive Items (ICRI) listed in Appendix C.

(b) Additionally, locations that routinely maintain, store, ship, or receive licensed radioactive materials, but do not possess an ICRI, will also require the appointment of an LRSO. This includes, but is not limited to: Combined Support Maintenance Shops (CSMS), USP&FO Warehouses, Maneuver Area Training Equipment Sites (MATES), and Unit Training Equipment Sites (UTES) (if a radioactive material maintenance or storage area is established).

(2) Designate, in writing, a Unit RSO (URSO) for units that use/store licensed radioactive commodities or radiation-emitting equipment that requires the implementation of a RSP. The training/experience of these individuals will be commensurate with the requirements set forth by the licensee(s) for those particular items/devices.

(3) Establish written RSP Standing Operating Procedures (SOP) and ensure that personnel comply with applicable Federal, DOD, and Army radiation safety regulations and directives.

(4) Establish a Radiation Safety Committee (RSC) when a technical publication, condition of an NRC license or ARA require that such a committee be established (see para. 2-2). This committee can be combined with other existing safety committee meetings provided the minutes reflect some appropriate discussion of the radiation safety program (i.e., dosimetry results, change in use of the radioactive commodity/system, etc.).

(5) Ensure that all personnel receive appropriate radiation safety training commensurate with the potential hazards from radiation sources used in their respective unit(s).

(6) If desired, the responsibility for the NIRSP may be separated from that of the IRSP by the appointment of a Laser Safety Officer (LSO) and/or an RF Safety Officer (RFSO), as appropriate, to oversee the implementation of the NIRSP program. If a separate LSO/RFSO is appointed, they will be responsible for those items designated in para 1-4(j).

(7) Advise all non-ARNG agencies that request authorization to use or store radioactive materials on ARNG property adhere to the requirements of AR 385-10, DA Pam 385-24 and this regulation. All ARNG contracts and leases will contain the requirement to restore ARNG property to unrestricted use as defined by NRC and DA criteria. This regulation will be referenced as the authority.

(8) Administer Army Radiation Permits (ARP) IAW AR 385-10 and DA Pam 385-24 (for use of radioactive material by contractors or outside agencies on property owned, leased, or operated by the ARNG).

h. The Local Radiation Safety Officer (LRSO) will:

(1) Meet the training requirements as specified in Appendix E.

(2) Be qualified to perform duties as specified in the applicable technical manual(s)/NRC License for an ICRI.

(3) Ensure that radioactive items are properly received, used, stored, handled, maintained, transported, and disposed of IAW licenses and TBs.

(4) Maintain records (see para 3-3, Reports and Records) IAW AR 25-400-2. Ensure all facility decontamination and/or decommissioning records are archived appropriately.

(5) Advise the SRSO of any proposed change in:

(a) Accountability of an item.

(b) LRSO/Alternate LRSO assignment.

(c) The location of an ICRI. An ICRI will not be relocated or released from accountability until the NGB RSSO evaluates and approves the relocation, the qualifications of the receiving LRSO, and the effectiveness of the IRSP at the receiving activity.

(6) Immediately notify the SRSO and the NGB RSSO (para 3-7, Accident Reporting) through the chain of command of:

(a) A theft, loss of accountability/control, destruction, or leakage of radioactive material.

(b) Damage of an ICRI and/or suspected radiological over-exposure. Potentially damaged items will not be used until their safety is confirmed and approved by NGB RSSO.

(7) Establish a restricted area, as required, by para 3-1(d).

(8) Establish storage areas for radioactive materials. Post areas IAW para 3-4(c).

(9) Provide the local fire department with written notice of the radioactive materials storage locations, as required by para 3-4(d).

(10) If the ARNG activity is a tenant on another installation (e.g., IMCOM, FORSCOM, etc.), coordinate with the Garrison RSO with regards to radiation incidents/accidents, radioactive material inventories and accountability, Radiation Safety Committee meeting participation and any other matters pertaining to the installation RSP.

(11) Notify the SRSO of new radioactive sources or commodities and/or ionizing or non-ionizing radiation-producing devices or systems prior to attainment.

(12) Establish and maintain a personnel ionizing radiation dosimetry program, as required in para 1-4e (7).

(13**)** Maintain Unit RSP records. Forward copies of all restricted area(s) close-out surveys to the SRSO and NGB RSSO.

i. The Alternate Local Radiation Safety Officer (ALRSO) will assist the LRSO in the management of the local RSP. In the absence of the LRSO, the ALRSO will assume the local RSP responsibilities and duties of the LRSO. Qualifications of the ALRSO are the same as those required for the LRSO. ALRSOs are required at the following:

(1) CSMS (possessing an AN/UDM-2 Calibrator or equivalent).

(2) Any location that possesses an item under an NRC License or ARA that requires the designation of an ALRSO.

For other locations, it is recommended that one be designated.

j. The Laser Safety Officer (LSO) and/or Radiofrequency Radiation Safety Officer (RFSO) will:

(1) Post appropriate warning signs and notices as required for laser/RF facilities.

(2) Ensure that appropriate laser personnel are included in an occupational health surveillance program as outlined in para 5-8.

(3) Review and sign the annual inventory of all laser/RF systems.

(4) Ensure that personnel operating laser/RF devices receive adequate instructions and training.

(5) Enforce safety rules and special precautions for Class 3b and 4 lasers and RF systems capable of exceeding the MPE limits.

(6) Report any laser/RF accident, suspected overexposure, unusual incident, or personnel injury, and refer injuries immediately for medical treatment IAW para 5-9.

k. Unit Radiation Safety Officer (URSO) will:

(1) Develop/maintain a SOP or other appropriate written guidance.

(2) Meet the training requirements as specified in Appendix E.

(3) Ensure that users are aware of the radiation safety aspects of radioactive commodity use.

(4) Provide guidance for the storage, inventory, and tracking of radioactive commodities, response to broken and damaged radioactive devices, and control of non-ionizing hazards.

(5) Coordinate with the Property Book Officer/ Serialization Officer for accountability of radioactive commodities.

(6) Properly store and secure radioactive commodities in locked, vented (e.g., H-3, Ra-226 commodities), and properly posted locations when not in use.

(7) Conduct surveys of storage areas after identification of suspected/known damaged commodities.

(8) Ensure that radioactive commodities are transferred to the CSMS for the conduct of leak tests, when required.

(9) Ensure that radioactive commodities are transported IAW Title 10 CFR Part 49, IATA, DTR 4500.9-R, and TB 43-0137.

(10) Immediately report accidents or incidents involving broken, damaged, or unaccounted for radioactive commodities IAW paragraphs 3-7 and 5-9, respectively. Properly secure and temporarily store damaged radioactive commodities or ionizing radiation-producing equipment until transfer to the USP&FO consolidated storage area.

(11) Maintain Unit RSP records. Forward copies of all restricted area(s) close-out surveys to the SRSO and NGB RSSO.

1-5. Objectives

The primary objectives of this regulation are to ensure that:

a. Radiation safety responsibilities are given priority.

b. Plans are developed and resources allocated to effectively implement and manage a State Radiation Safety Program (RSP). The RSP includes elements of both the Ionizing Radiation Safety Program (IRSP) and Non-Ionizing Radiation Safety Program (NIRSP).

c. Compliance with DA Pam 385-24.

Chapter 2
Licensing and Control of Ionizing Radiation Sources

2-1. NRC Specific Licenses

a. NRC specific licenses are issued to the U.S. (AMC) Major Subordinate Commands (MSCs). ARNG facilities or activities are not authorized to obtain NRC issued specific licenses. ARNG units, activities, and facilities may requisition, issue, store, transport, and use standard type issue items in the Army supply system that have been licensed by the NRC to AMC MSCs. Contact the ARNG RSSO if an item, not in the Army-system, is to be procured or possessed that requires a specific NRC License.

b. When civilian contractors perform Army radiation work on Army facilities, under the auspices of any Army NRC license, the contract must contain specific requirements connecting the contracted work to license conditions and any other administrative requirements of the facility Radiation Safety Program. Civilian contractors will, if possible, obtain NRC licenses for their operations on Army property.

c. Contractors may not work under the auspices of an Army NRC license in non-Army facilities, or at off-post locations. Contact the RSSO for further guidance, as needed.

2-2. Radiation Safety Committee (RSC)

When a technical publication or condition of an NRC license or ARA requires a RSC, it will meet the following requirements in addition to any other requirements of its charter.

a. The RSC will meet at least once in each six month period and at the call of the chairman.

b. The local commander, or designated representative, and RSO shall be permanent members of the RSC. Other members shall be at the discretion of the RSO.

c. Minutes of the RSC shall be recorded and maintained on file.

2-3. General Licensed (GL) Radioactive Items

A specific license is not required to purchase or possess a GL item. The general license ensures that the device is approved and is safe to use and states the reporting and other requirements that must be met by the user, such as leak testing. Examples of GL items commonly used by the ARNG are the Vapor Tracer and the Itemiser. NGB, ARNG units, facilities, or activities that acquire, receive, possess, use or transfer byproduct material in a device pursuant to the general license shall:

a. Ensure that all labels affixed to the device at the time of receipt and bearing a statement that removal or covering up of the label is prohibited are maintained thereon and shall comply with all instructions provided by such label.

b. Ensure that the device is tested for leakage of radioactive material at intervals specified by the RSSO IAW the manufacturer's instructions.

c. Maintain leak test records.

d. Immediately suspend operations of the device if there is:

(1) A failure of, or damage to the device.

(2) Any indication of possible damage of the source housing.

(3) A failure of the on-off mechanism or indicator.

(4) Notification of a failed leak test.

e. Not abandon the device.

f. Transfer GL items only to persons authorized to receive and possess GL items. Authorized recipients are:

(1) The manufacturer.

(2) NRC licensed disposal activity or facility.

(3) Holder of a specific NRC license.

g. Notify the NGB RSSO at time of disposition, to ensure proper transfer, turn-in, disposal and reporting of the device(s).

h. Comply with the provisions of Title 10 CFR Part 20 for reporting incidents theft or loss of the devices (see para 3-7).

i. Assign a point of contact, having knowledge of the device and appropriate regulations covering its safe use.

j. If a GL item is transferred to a specific license, the requirements of the specific license must be met. These requirements may differ from those listed above.

2-4. Army Radiation Authorizations (ARA) and Army Radiation Permits (ARP)

a. The NGB will follow ARA and ARP program requirements as delineated in AR 385-10 and DA Pam 385-24.

b. ARAs are used to control specific ionizing radiation sources (including machines that emit ionizing radiation) that the NRC does not license.

(1) ARNG units, activities, and facilities may requisition, issue, store, transport, and use standard type issue items in the Army supply system that are authorized under an ARA managed by any AMC MSC.

(2) Applications for ARAs by facilities or activities within the ARNG for equipment not covered under an existing ARA will be forwarded through the chain of command to the SRSO, who will forward to the NGB RSSO for review and approval prior to procurement.

c. ARPs are for the use, storage, and possession of radioactive sources on ARNG facilities or installations by non-ARNG organizations or non-Army agencies. ARPs are approved by the officer-in-charge of the facility or installation after concurrence by the SRSO. The NGB RSSO can provide guidance or assistance, if required.

2-5. X-Ray Machines and Ionizing Radiation-Producing Devices

a. X-ray machines and ionizing radiation-producing devices are regulated by both the US Food and Drug Administration (FDA) and State/Territorial regulatory agencies; not by the NRC.

b. For x-ray machines and other x-ray producing devices being used on Non-Federalized (i.e., State) property, notify the appropriate State regulatory agency to ensure that all State-specific requirements are being met as they may pertain to device registration and fees, surveys, operator training, etc.

c. Users of x-ray equipment and ionizing radiation-producing devices shall periodically review applicable Federal, State, and Army regulations to ensure compliance with the most current regulations.

d. Categories: The ionizing radiation producing devices utilized by the ARNG fall under three general categories:

(1) Diagnostic medical/dental imaging systems:

(a) Medical/dental x-ray imaging devices will be used IAW the requirements of TB Med 521.

(b) X-ray shielding designs, acceptance testing, and x-ray system surveys are required prior to clinical use. These functions may be performed by:

(1) The Regional Medical Command (RMC).

(2) The Center for Health Promotion and Preventive Medicine (CHPPM).

(3) The appropriate State Department of Health.

(4) Contracted out locally to a Certified Health Physicist qualified to perform these functions.

(5) Others as approved by the NGB RSSO.

(c) If using contractual services, requirements will be identical to those required for the DoD. All contracts must clearly specify these DoD documentation requirements. Consider including statements similar to the following in all contracts that require calibration of X-ray systems: "The contractor shall complete DD Form 2164. A continuation sheet shall be attached to the DD Form 2164 indicating the manufacturer, model, serial number, and date of expiration of all items of test and measurement equipment used to perform the calibration. Required forms and extracts from pertinent directives will be furnished to the contractor by the government."

(d) Whether using Army, State or private contractors the following records must be on file upon completion of the subject system(s) test:

(1) The initial acceptance inspection report to determine compliance with manufacturer's stated specifications.

(2) A current Form FDA 2579 (Report of Assembly of a Diagnostic X-ray System). Request a copy of this form from the equipment installer per 21 CFR 1020.30.

(3) A copy of DD Form 2164 (X-ray Verification/ Certification Worksheet).

(4) Copy of the initial radiation protection survey performed by a qualified expert (listed in 2-5d (1) (b) above).

(5) Others as approved by the NGB RSSO.

(2) Industrial Nondestructive Testing Equipment:

(a) Nondestructive test equipment (NDTE) (e.g., LORAD LPX160 portable x-ray unit) shall be used IAW TM 1-1500-335-23, “Nondestructive Testing Methods, Basic Theory” and ARA A45-0129-NGB, issued by the NGB RSSO.

(b) Prior to units deploying with NDTE, the gaining organization shall be consulted, as applicable, to verify State/country legality and requirements for use of the NDTE. Additionally, the SRSO will be notified of the NDTE movement.

(3) Cabinet Security Screening Systems: Cabinet x-ray systems will be installed by qualified personnel and used IAW the manufacturer's instructions.

Chapter 3
Radioactive Material/Commodities

3-1. Controls

a. The ICRIs identified in Appendix B shall not be handled by unauthorized personnel. Controls will be imposed so that only trained and qualified personnel will use them. In the event that a qualified LRSO is unavailable the unit/activity will:

(1) Deny the requisition of the ICRI, if it is first being requisitioned.

(2) Stop the use of an on-hand ICRI until an LRSO can be qualified by training.

(3) Transfer the ICRI to a location or activity that has the proper RADIAC equipment, facility, and qualified personnel to support the item. Adequate safety equipment will be available to support the safe use of these items. As required, periodic inventory and leak/wipe testing will be performed to ensure that controlled items remain safe and at authorized locations.

b. Both the NRC and DA require control of all operations involving items containing radioactive material to ensure safety of personnel and property. ARNG units, facilities, and installations having licensed radioactive sources, and the agencies controlling them, are subject to inspections by the NRC.

c. When practical, the same logistics procedures applied to all other Army supplies will be used for radioactive items. Army administrative, safety, or regulatory requirements unique to radioactive items are published in supply and technical manuals or bulletins.

d. The unit/activity will establish a restricted area if the use or storage of standard military radioactive materials and/or commodities may:

(1) Create exposure rates in excess of 2 millirem per hour (mrem/hr).

(2) Cause personnel to receive 100 millirem or more in a calendar year.

e. Smoking, eating, drinking, chewing, or applying cosmetics will not be permitted in areas where radioactive materials are used or stored. Food or drink will not be stored in areas where radioactive materials are stored.

3-2. Requisitioning, Transfer, and Turn-In

a. Requisitioning Individually Controlled Radioactive Items.

(1) All requisitions for ICRIs (Appendix C) will be sent through command channels to the appropriate AMC Major Subordinate Command (MSC) commodity manager and coordinated with the SRSO and NGB RSSO.

(2) Supporting documentation will be provided, upon request, to the NGB RSSO.

b. Transfer.

(1) ICRIs will not be transferred without the concurrence of the SRSO, the approval of the NGB RSSO, and the commodity command item manager. Approval for transfer will be given when it is determined that the receiving unit or installation has an authorization for the equipment; an effective, documented IRSP, to include a dosimetry program; qualified personnel; appropriate facilities/equipment; and justification for the item.

(2) General licensed radioactive items will not be transferred without approval from the NGB RSSO and notification to the appropriate regulatory authority.

c. Turn-in. For radioactive material requiring turn-in or demilitarization (DMIL), contact the Item Manager (IM) for disposition instructions.

3-3. Reports and Records

a. The following documentation will be maintained to include, but not be limited to:

(1) Records of sealed source leak tests (as applicable).

(2) RSO, LSO and RFSO appointing orders, training records and certificates of training.

(3) Radiation safety training.

(4) Emergency notification(s) to local fire departments.

(5) Radiological survey reports.

(6) Radioactive package shipment survey results.

(7) Radioactive material and ionizing and non-ionizing radiation-producing device inventory.

(8) Excess radioactive material disposition records.

(9) Radiological Incident/Accident reports and Reports of Survey.

(10) RSP inspection and/or self-evaluation reports.

b. Record Retention. The above records will be maintained IAW AR 25-400-2.

3-4. Storage of Radioactive Material and Postings

a. Areas for the secure storage of radioactive material will be identified and properly posted. Radioactive materials shall not be stored with food products, medical supplies, explosives, flammables, combustibles or other hazardous materials. In addition, storage containers will be fire resistant and not placed in areas prone to flooding.

b. In order to minimize personnel exposure, all radioactive material should be segregated and stored in a secured, isolated area. In addition, isotopes capable of creating an airborne hazard such as tritium should be stored in a well-ventilated area.

c. All storage areas that contain licensed radioactive material will be posted as follows:

(1) Current copy of NRC Form 3 (Notice to Employees).

(2) "Caution – Radioactive Material" warning signs.

(3) List of individual(s) and phone number(s) to notify in the event of an emergency.

(4) Sign prohibiting smoking, eating, drinking, chewing, or applying cosmetics, as required.

(5) Section 206 of the Energy Reorganization Act of 1974.

(6) 10 CFR, Parts 19, 20 and 21.

(7) A copy of the local SOP or regulation.

(8) Applicable NRC License(s).

(9) All notices of violation from the NRC.

(10) In lieu of posting items (6) through (8) above, post a memorandum or notice indicating where employees may review the documents. NOTE: General Licensed Radioactive Items and thorium-fluoride coated optics are exempt from these posting requirements. Also, Civil Support Teams (CST)/Weapons of Mass Destruction (WMD) storing radioactive items for rapid deployment may waive the requirement for displaying the "CAUTION: RADIOACTIVE MATERIAL" placard when these items are stored in/on vehicles, consistent with the conditions specified under 10 CFR 20.1903.

d. The local fire department will be provided with written notification of the:

(1) Location of ICRIs (to include the type of material and activity) stored at a facility. A copy of the written notification to the local fire department will be maintained on file.

(2) Storage locations, types of sources and typical activities of licensed radioactive material (since they change routinely) stored at the USP&FO, CSMS, Mobilization and Training Equipment Site (MATES), Unit Training Equipment Site (UTES) and other maintenance/support facilities.

3-5. Radiological Surveys

a. Surveys. Surveys- (dose rate and/or contamination, as appropriate) shall be conducted on a quarterly basis unless a different survey requirement is stipulated in the NRC license, the technical manual/bulletin for a specific commodity/ICRI, or as directed by the NGB RSSO. Areas requiring surveys include DS/GS Maintenance Facilities that work with radioactive commodities, USP&FO warehouse, MATES/UTES storage locations, and ICRI storage locations.

(1) Baseline Survey. Upon designation of a radioactive material storage area, prior to the placement of radioactive material in the area, a dose rate survey and removable contamination survey shall be conducted and documented to record the background radiation levels found in the area, as well as the presence of any unknown contamination.

(2) Initial Survey. Immediately following the initial placement of radioactive material in the storage area an initial dose rate survey shall be performed. Special emphasis should be placed on radiation field measurements in occupied areas adjacent to the storage room to ensure adequate protection of personnel.

(3) Routine Surveys. Routine surveys to indicate radiation dose rate and removable contamination are performed to ensure that exposures of personnel to ionizing radiation are maintained as low as is reasonably achievable (ALARA).

(4) Close-out Survey. A close-out survey is performed and documented in writing when an operation or project is terminated prior to releasing the facility for unrestricted use. The purpose of the close-out survey is to determine that all radiation sources have been removed and there is no residual contamination. For close-out surveys, refer to the current guidance found in AMC memorandum, "Guidance on Radiological Decommissioning Survey for Areas Where NRC Licensed Commodities Were Used," or contact the NGB RSSO. Copies of all close-out surveys will be provided to the NGB RSSO and maintained on file by the SRSO.

b. Forms. The following information shall be recorded on the Facility Radiological Survey Form (see sample in Appendix C):

(1) A schematic drawing of the area.

(2) Monitoring points recorded on the drawing to include meter readings locations.

(3) Background meter reading(s).

(4) Date of survey.

(5) Name, title, and signature of the surveyor.

(6) Identification of the instrument(s) and detector(s) used, to include serial number(s), date of last calibration and calibration void date.

(7) Evaluation of the safety characteristics of the location and operation to include: warning signs, required postings, SOPs, etc.

c. RADIAC Instrumentation and Wipe Test Material. Storage and maintenance area surveys shall be performed using an "ACTIVE" RADIAC instrument calibrated, as required, for the type of radiation to be measured.

(1) The following pre-operational checks will be performed and documented by the users of "ACTIVE" calibrated instruments:

(a) Calibration label check.

(b) Check/Insert batteries.

(c) Visually inspect instrument for damage.

(d) Daily or before use, conduct a test response to radiation using a dedicated check source.

(e) Perform pre-operational tests as outlined in the applicable TM (i.e., AN/PDR-77; AN/VDR-2).

(f) Zero meter; perform light leak check (alpha), if applicable.

(2) The appropriate type of wipe test material (NUCON or Metricel/Whatman) shall be used to assess the level of removable contamination present. All survey wipes shall be sent to the CECOM DS Radiation Analysis & Calibration Laboratory (RACL) for analysis. Samples submitted for analysis must be forwarded with a completed CECOM DS "Wipe Test Analysis Request Form" in order to be processed.

3-6. Inventory of Radioactive Materials

a. Inventory records will identify:

(1) Specific radioactive items of supply, sources, and radiation-producing devices.

(2) Physical location of the item(s).

(3) Quantity on-hand at each location.

(4) National Stock Number (NSN), Line Item Number (LIN), Type Number, or National Item Identification Number (NIIN), as available.

b. The inventory will be conducted annually and documents will be maintained IAW AR 25-400-2.

3-7. Radiological Accidents/Incidents

a. General.

(1) A radiological accident/incident is:

(a) Any unusual occurrence involving radioactive material.

(b) Any occurrence in which a radioactive commodity is damaged to the extent that radioactive materials have or may have been released, or

(c) Control or accountability for a radioactive item is lost.

b. Reporting.

(1) Events involving sources of ionizing radiation, to include theft, loss of control, destruction, leakage of radioactive material or suspected overexposures, will be investigated and reported by electronic or telephonic means immediately upon discovery to the:

(a) SRSO.

(b) NGB RSSO at the address indicated in Appendix D. (The NGB RSSO will, in turn, notify the appropriate licensee.)

(2) All radiological accidents and accounts will be reported IAW DA Pam 385-40.

(3) A written follow-up to the initial report giving the details of the incident, the corrective actions taken, and program modifications instituted to prevent a recurrence will be sent through the SRSO to the NGB RSSO. This report will be furnished within 15 days of the incident, or at the request of the NGB RSSO (see Para. 6-3 of DA Pam 385-24).

c. Response.

(1) Under no circumstance will emergency medical attention be delayed because of the presence or suspected presence of radioactive contamination.

(2) In-house emergency response procedures will be developed and followed by all personnel in the vicinity of a breakage or damage of a radioactive commodity.

(3) Areas of suspected contamination shall be evacuated and secured. A contamination survey shall be performed for immediate analysis by the CECOM LCMC RACL.

(4) The RSO will determine the requirements for radiological surveys, decontamination and/or personnel monitoring/bioassay. The need for a bioassay will be made only after discussion of the details of the incident with the RSSO.

(5) Damaged Fire Control Devices (FCD) containing tritium shall be isolated to prevent the spread of contamination. Damage will be assessed by performing an illumination check followed by a wipe test of the device. Damaged devices will be double wrapped in plastic bags (clear, if available), labeled accordingly, and then secured in a well ventilated area, preferably outdoors.

(6) The area and equipment involved in the incident will be closed to all personnel until its release is authorized by the RSO overseeing the incident.

3-8. Personnel Protective Equipment (PPE)

a. PPE is not routinely required to be worn by personnel that handle radioactive commodities of supply. Under the following conditions, personnel shall don disposable gloves and shall cover work surfaces with plastic or kraft paper to minimize the risk of contamination to personnel:

(1) When working on the interior of the Chemical Detection Equipment (CDE) or when performing a wipe test, or

(2) When performing maintenance or a wipe test on a suspected broken/damaged radioactive commodity or source such as a tritium Fire Control Device or dial/gauge.

(3) When conducting DEMIL operations.

b. Adequate ventilation will be utilized that is appropriate to the potential hazard from sources capable of producing an airborne hazard.

3-9. Training

Refer to Appendix E for a matrix of training requirements.

3-10. Facilities

a. To reduce the potential of fire related disasters, buildings where radioactive materials are used or stored should be constructed of fire retardant materials.

b. Plans and design specifications for medical/industrial radiographic facilities will be reviewed and evaluated by a qualified health physicist or other expert before the modification or construction of the radiographic facility.

c. Facilities, rooms, or cages that store tritium FCDs shall have adequate ventilation. Where possible, areas shall be ventilated to the outdoors and not to adjacent enclosed areas. It is highly recommended that storage of tritium FCD be in outdoor shed-type storage or unoccupied buildings, separate from the work area.

d. Shelving within storage areas should be comprised of materials that are easily decontaminated (i.e., metal, plastic) or lined with protective barriers, such as plexi-glass or kraft paper, that are easily disposed of. Storage surfaces should be kept relatively free from excessive dirt, grease, etc.

3-11. Medical Surveillance Personnel occupationally exposed to ionizing radiation do not require any special medical screening other than that which is normally required for technicians working in a hazardous environment. The State Surgeon will be responsible for establishing policy relating to health surveillance of ARNG personnel occupationally exposed to ionizing radiation.

3-12. Exposure Standards ARNG policies regarding ionizing radiation exposure standards and the recording of exposure to ionizing radiation are specified in DA Pam 385-24, Table 5-1, and are consistent with requirements of Title 10 CFR Part 20.

Chapter 4
Transportation, Identification, and Disposal of Radioactive Material

4-1. Transportation Procedures

a. Radioactive Material Offered for Commercial Carrier.

(1) Domestic shipments of radioactive materials will be IAW applicable NRC (10 CFR 71), DOT (49 CFR), and U.S. Postal Service (39 CFR) regulations and per DTR 4500.9-R (Part II).

(2) International shipments of radioactive materials will be IAW applicable U.S. and International Air Transport Association (IATA) Dangerous Goods Regulations and host nation regulations.

(3) When using a commercial carrier, i.e., FedEx®, USPS®, etc., the requirements of that agency shall be adhered to. Special restrictions and costs may apply to the shipment of radioactive material therefore coordinate with the delivery service prior to shipment.

(4) Only authorized HAZMAT trained personnel can certify shipping papers for 'Type A' quantities of radioactive material. Specific training requirements are in 49 CFR and DTR 4500.9-R.

(5) All shipments of radioactive material should be documented using a Radioactive Material Movement Form (RMMF) such as the one provided in Appendix F.

b. Military Shipments of Radioactive Material. TB 43-0137 contains detailed guidance on the requirements necessary to properly prepare a radioactive commodity for transport for military purposes. ARNG personnel who transport RAM in military owned and operated vehicles for non-commercial purposes (i.e., deployments, field exercise, etc.) may do so IAW the requirements as prescribed in TB 43-0137 Section III, "Military Transportation Information for U.S. Army Radioactive Commodities."

4-2. Identification of Radioactive Materials/Commodities

The presence of radioactive items can be determined by:

a. Visible markings and/or labels on the items.

b. Information in TB 43-0116; Federal Logistics Data (FEDLOG); the Federal Logistics Information System (FLIS); and the Hazardous Material Information Resource System (HMIRS).

c. Information contained in the technical literature governing the item.

d. Use of an appropriate RADIAC instrument.

e. Contacting the Item Manager (IM).

4-3. Disposal of Unwanted Radioactive Material

a. Consolidation. Installations or facilities that have excess or unwanted radioactive material will place the material in a secure, local storage area pending transport to a consolidation point within the State/Territory. The USP&FO Warehouse, which is able to safely store bulk quantities of unserviceable or excess radioactive material, is best suited to serve as the designated radioactive material consolidation facility.

b. Disposition Instructions Prior to disposal, request disposition instructions from the IM for the NSN in question.

(1) Radioactive material is prohibited from being transferred to the Defense Reutilization and Marketing Office (DRMO). Turn-in documents will indicate that items transferred to the DRMO, after DMIL has been performed, are certified free of radioactive material/contamination.

(2) Disposal of Radioactive Material. Requests for disposal instructions will be submitted through command channels to the SRSO, who will forward to the NGB RSSO. Refer to Appendix F for an example request. Request for disposal instructions shall contain, as a minimum, the following information:

(a) NSN
(b) Isotope
(c) Activity per item (i.e., Becquerel (Bq), MBq and mCi (millicurie))
(d) Nomenclature
(e) Serial number for each ICRI only
(f) Quantity per NSN
(g) Total Activity (MBq and mCi)
(h) POC and telephone number to obtain additional information
(i) The exact location including county.

(j) Remarks, i.e., commercial items, foreign equipment, waste from operations, etc.

(3) Radioactive material disposal documentation and manifests will be maintained permanently on file at the USP&FO and the office of the SRSO.

Chapter 5
Control of Non-ionizing Radiation-producing Equipment

5-1. General

a. The ARNG will comply with NIRSP requirements in AR 385-10, DA Pam 385-24, DODI 6055.11 and DODI 6055.15. Type-classified laser/RF producing system users and maintainers will comply with the radiation safety guidance in applicable technical publications.

b. Routine evaluations of laser and RF producing systems are not normally required. Equipment evaluations of Maximum Permissible Exposure (MPE) - classified systems are performed by the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) prior to fielding. Recommendations from these evaluations pertaining to the safe use of these systems are incorporated into equipment technical manuals.

c. Requests for equipment evaluations of systems not previously performed (e.g., commercial off-the-shelf (COTS) equipment) and for technical advice and assistance relating to the use of non-ionizing equipment and/or the establishment of a NIRSP, will be obtained on request from the SRSO with guidance from the ARNG RSSO at the address in Appendix D.

d. Use of laser/RF devices for other than the intended purpose is not authorized. Contact your SRSO for guidance prior to any proposed change to equipment configuration, operating parameters, etc.

5-2. Exposure Standards

a. Lasers

(1) Laser producing systems are classified with regard to relative hazard levels at the time of manufacture against established criteria, and are labeled accordingly.

(2) Where personnel may be exposed to levels that exceed the applicable MPE values of ANSI Z136.1, suitable radiation protection controls, procedures, and appropriate laser safety eyewear may be required and are cited in the applicable TMs. Previously evaluated laser systems may be listed in AR 385-63, TB MED 523, and/or MIL-HDBK-828A, along with important technical selection criteria for eye protection (e.g. Optical Density (O.D.), wavelength, etc.).

(3) Valuable insight into the prevention and detection of laser injuries, as well as photographs of various laser eye injuries, is provided in FM 8-50.

b. Radiofrequency Energy/Radiation Producing Equipment

(1) Where personnel may be exposed to levels that exceed the applicable MPE values of DODI 6055.11, suitable radiation protection controls and/or procedures may be required and are cited in the applicable TMs. Previously evaluated RF-producing systems are listed in TB 43-0133 along with pertinent radiation safety guidance (e.g., personnel exclusion zones and/or distances).

(2) No practice shall be adopted or operation conducted resulting in exposure of personnel to RF levels in excess of the applicable MPE unless:

(a) approved by the Director of the Army Staff (DAS) or

(b) approved by an Institutional Review Board (IRB) or

(c) the unit commander has determined the benefits outweigh the risks in a contingency environment.

5-3. Inventory and Control of Non-ionizing Sources

a. Potentially hazardous laser and/or RF radiation producing sources/systems (those which may produce levels of exposure in excess of established MPEs (for lasers and RF producing sources/systems) will be identified and controlled:

(1) At a minimum, laser systems to be identified will include all Class 3b and 4 lasers (c*lassifications may also be found in Roman Numeric format (e.g. Class IIIb and Class IV lasers, etc.)*. A simplified summary of the laser hazard classification scheme is listed in Appendix B, Section II.

(2) RF radiation-producing systems capable of exceeding the MPE values of DODI 6055.11.

b. SOPs must be published and enforced for all RF systems capable of exceeding the MPE values and Class 3b and 4 laser systems (this may be incorporated into the State regulation). SOPs must specify any safety policies

concerning operational limitations placed upon equipment and the control of movement of personnel to ensure that the exposure to personnel is minimized. At a minimum, an SOP shall be required to control systems at the following specific locations:

(1) RF and/or laser maintenance facilities.

(2) RF and/or laser training facilities and ranges.

c. DoD Exempt Lasers will be accounted for, appropriately labeled, and properly disposed of IAW guidance and references contained in DODI 6055.15.

d. Commercially-procured common use lasers (e.g., laser pointers, lasers embedded in equipment and other lasers not procured for military-specific uses) will be used IAW product performance standards contained in ANSI Z136.1.

5-4. Personal Protective Equipment (PPE)

a. PPE should be used only when other control measures do not provide adequate protection, and PPE should not normally be necessary for RF and laser operation and maintenance of Army systems.

b. Personnel whose occupation or assignment requires exposure to potentially eye hazardous laser beams will be furnished suitable laser safety goggles or eyewear.

c. The optical density requirements for eyewear needed to protect from specific Army fielded lasers can be found in AR 385-63 and MIL-HDBK-828A.

d. RF protective clothing is prohibited for routine use as a means of protecting personnel from hazardous levels of RF radiation. Ancillary protective equipment, such as electrically insulated gloves for protection against RF burn or shock, is permissible, where necessary.

e. RF radiation dosimeters will not be used.

5-5. Training

a. Personnel who routinely work with Class 3b or 4 lasers or equipment that emits RF levels in excess of the MPE values shall receive training commensurate with the hazards and the procedures and restrictions needed to control exposures. Training shall be conducted prior to assignment. It is also recommended that training be conducted periodically thereafter at the discretion of the local commander. Instruction topics will include:

(1) Safe working techniques and practices.

(2) RF and/or laser hazards.

(3) Procedures to be followed when an accident or incident occurs.

b. Maintenance personnel shall familiarize themselves with the safety procedures provided in the technical bulletins (tb) and maintenance manual(s) for the device. Only specially trained maintenance personnel will be permitted to work on laser systems.

5-6. Facilities/Ranges

a. Outdoor laser operations will be conducted only at firing ranges and non-live fire training areas specifically authorized for their use.

b. An LSO will be appointed and will ensure that SOPs are developed and implemented for all laser range operations.

c. Specific procedures to be followed regarding the use of LASER devices on laser/firing ranges can be found in Chapter 19 of AR 385-63.

d. Additional guidance on the safe use of military lasers and laser systems on laser ranges can be found in MIL-HDBK-828A and TB MED 524 and ANSI Z136.6.

e. Use of laser/RF devices other than the intended purpose is not authorized. Contact your SRSO and NGB RSSO for guidance prior to any proposed change to equipment configuration, operating parameters, RF output, etc.

5-7. Warning Signs, Labels and Postings

a. All laser and RF controlled environments will be properly marked with appropriate warning signs IAW applicable TMs, TBs and local SOPs. Instructional or warning statements should be inserted on the signs, where applicable.

b. Areas that exceed the MPE values as identified in equipment TMs/TBs and operating manuals shall be conspicuously posted.

c. Variations, to include subdued signs for camouflage or tactical reasons, or to provide improved visibility under certain lighting conditions, are authorized, provided the general layout of the sign remains the same.

d. Commanders may waive the requirements for signs, in response to military operational considerations, provided an appropriate risk assessment is performed and documented, safety personnel are consulted, and personnel are informed of potential hazards by other means.

e. In areas where access to levels in excess of 10 times the MPE values may exist, warning signs alone do not provide adequate protection. Other warning devices such as flashing lights, audible signals, barriers, or interlocks, are required dependent on the potential risk of exposure.

5-8. Medical Surveillance

a. Preplacement and termination ocular examinations are required for any personnel who work with class 3b and 4 laser devices as outlined in DOD 6055.05-M.

b. Personnel will be designated as incidental laser workers or laser workers by the SRSO.

c. Immediate examinations will be administered when there is a known or suspected laser overexposure. The exam will be performed within 24 hours or as soon as possible after the suspected exposure is reported. The Tri-Service LASER Incident Hotline (DSN: 240-4784 or COM: 1-800-473-3549; e-mail: laser.safety@brooks.af.mil) is available to assist attending physicians treating laser injuries.

d. RF workers have no medical or vision screening requirement beyond that done routinely under NGB occupational health guidelines. However, in the case of a known or suspected overexposure to RF radiation above the MPE value (i.e., a person has entered an area specifically restricted due to exposure to potentially hazardous RF fields), an appropriate eye examination is required.

5-9. Accident Reporting

a. All incidents and accidents will be investigated with the following information collected as a minimum:

(1) Documentation providing a description of the circumstances surrounding the exposure incident.

(2) Statements from personnel involved in the incident.

(3) Recommendations to prevent similar occurrences.

b. All alleged overexposures or accidents involving non-ionizing radiation will be reported under the requirements of AR 40-400 and DA Pam 385-40.

c. If an alleged laser/RF radiation accident or over-exposure occurs:

(1) Disconnect the power from the system that caused the potential exposure. Do not alter the configuration of the system.

(2) Notify the SRSO and LSO/RFSO, if appointed, and the Occupational Health Nurse/State Surgeon.

(3) Ensure that the potentially exposed individual(s) receives an appropriate medical evaluation within 24-hours of the exposure.

(4) Notify the NGB RSSO within 24-hours at the number provided in Appendix D.

(5) The NGB RSSO will notify USACHPPM within 24-hours to forward incident information.

Appendix A
References

Section I
Required Publications

ANSI Z136.1
American National Standard for Safe Use of Lasers

ANSI Z136.4
Recommended Practice for Laser Safety Measurements for Hazard Evaluation

AR 11-2
Management Control

AR 25-400-2
The Army Records Information Management System

AR 40-400
Patient Administration

AR 385-10
The Army Safety Program

AR 385-63
Range Safety

AR 710-3
Inventory Management Asset and Transaction Reporting System

DA Pam 40-18
Personnel Dosimetry Guidance and Dose Recording Procedures for Personnel Occupational Exposed to Ionizing Radiation

DA Pam 385-24
The Army Radiation Safety Program

DA Pam 385-40
Army Accident Investigations and Reporting

DOD 4160.21-M
Defense Material Disposition Manual

DOD 6055.05-M
Occupational Medical Examinations and Surveillance Manual

DODI 6055.8
Occupational Radiation Protection Program

DODI 6055.11
Protection of DOD Personnel from Exposure to Radiofrequency Radiation and Military Exempt Lasers

DODI 6055.15
DOD Laser Protection Program

DTR 4500.9-R (Part II)
Defense Transportation Regulation-Cargo Movement

MIL-HDBK-828A
Laser Safety on Ranges and in Other Outdoor Areas

TB 43-0116
Identification of Radioactive Items in the Army

TB 43-0133
Hazard Criteria for CECOM Radiofrequency and Optical Radiation-Producing Equipment

TB 43-0137
Transportation Information for U.S Army Radioactive Commodities

TM 1-1500-335-23
Non Destructive Inspection Methods, Basic Theory

U.S. Postal Publication 52
Hazardous, Restricted and Perishable Mail

10 CFR
Energy

39 CFR
Postal Service

49 CFR
Transportation

Section II
Related Publications

AMCCOM P 385-1
Handbook for Disposal of Unwanted Radioactive Material

AR 40-5
Preventive Medicine

DA Pam 385-30
Mishap Risk Management

FM 5-19
Composite Risk Management.

FM 8-50
Prevention and Medical Management of Laser Injuries

TB 43-180
Calibration and Repair Requirements for the Maintenance of Army Materiel

TB 43-0197
Instructions for the Safe Handling, Maintenance, Storage and Transportation of Radioactive Items

TB 43-0216
Safety and Hazard Warnings for Operation and Maintenance of TACOM Equipment

TB 43-0255
Disposition/Disposal Information for CECOM Radioactive Commodities

TB 385-4
Safety Requirements for Maintenance of Electrical and Electronic Equipment

TB MED 521
Occupational and Environmental Health Management and Control of Diagnostic, Therapeutic, and Medical Research X-Ray systems and Facilities

TB MED 523
Control of Hazards to Health from Microwave and Radiofrequency Radiation and Ultrasound

TB MED 524
Control of Hazards to Health from Laser Radiation

21 CFR Pt 1040
Performance Standards for Light-Emitting Products

Section III
Prescribed Forms

ARNG RADIATION SAFETY NOTICE

LEAK TEST ANALYSIS REQUEST FORM

NRC FORM 3
Notice to Employees

Public Law 93-438
Section 206

WIPE TEST ANALYSIS REQUEST FORM

Section IV
Referenced Forms

DD Form 2164
X-Ray Verification/Certification Worksheet

Form FDA 2579
Report of Assembly of Diagnostic X-Ray System

Appendix B
Individually Controlled Radioactive Items of Supply

Designation & NSN	Use	Radionuclide Activity and Half-life	Frequency of Leak Test*	Reference
AN/UDM-2 6665-00-179-9037 RADIAC Calibrator	Calibrated and sealed beta source for tactical RADIAC meters:	Sr-90/Y-90, 180 millicuries, 28.8 years	6 months	TM 11-6665-227-12
MC-1 6635-01-030-6896 Campbell Pacific Nuclear Moisture Density Tester	Calibrated and sealed gamma and fast neutron source for measuring asphalt, moisture, and soil density	Cs-137, 10 millicuries, 30.07 years and Am-241, 50 millicuries, 432.2 years	6 months	TM 5-6635-386-12&P
Mobile vehicle & cargo inspection system (MVACIS)	Portable gamma imaging system used to non-intrusively or inspect freight	Co-60, 1.0 curies, 5.26 years Cs-137, 1.6 curies, 30.07 years	Annual [Science Applications International Corporation (SAIC)]	Operator's Manual
Portable isotropic neutron spectroscopy(PINS)	neutron source used for chemical assay of munitions	Cf-252, 5.2 millicuries, 2.65 years	Quarterly (Frontier Corporation)	Operator's Manual
LORAD Industrial X-ray System	X-ray device used to non-intrusively determine aircraft serviceability	N/A	N/A (LORAD)	Operator's Manual

* or as outlined in the Sealed Source and Device Registry (SSDR)

Appendix C
Facility Radiological Survey Form

(Sketch of area)

Survey Meter Readings: All readings are in mR/hr at waist level unless otherwise indicated.
(*) denotes "Contact Reading Taken at This Point"
Background Reading:_____ mR/hr

Source Container Survey Points (storage):
S1:_____ S2:_____ S3:_____ S4:_____ S5:_____ S6:_____
Calibration Survey Points (in-use):
C1:_____ C2:_____ C3:_____ C4:_____ C5:_____ C6:_____
C7:_____ C8:_____ C9:_____ C10:_____ C11:_____

Postings:

1. Standing Operating Procedure _____
2. Caution Radioactive Material Sign _____
3. NRC Form 3 _____
4. Public Law 93-438 _____
5. NRC License No. _____
6. 10 CFR Parts 19, 20 & 21 _____
7. No Smoking, Eating, Etc. Sign _____
8. Notice of Violations _____
9. Notice to Workers (Emergency) _____
10. TM (On-hand only) _____

Survey Instrument Used:
Nomenclature:_____ SN:_____
Detector:_____ SN:_____
Date Calbr:_____ Calbr Void:_____
Pre-Operational Checks Performed: YES/NO (Circle One) Results: SAT/UNSAT (Circle One)

Comments:_____

Name:_____ **Date:**_____

Appendix D
Addresses and Emergency Telephone Numbers
Emergency Point

Emergency Point of Contact	Address	Office	DSN	Commercial
NGB RSSO	Commander, US Army Communications-Electronics Command Attn: AMSEL-SF-R Fort Monmouth, NJ 07703-5024	Dir for Safety Operations Center	987-7445	(732) 427-7445
CECOM Radiation Analysis & Calibration Laboratory (RACL)	Attn: AMSEL-SF-R(LAB) Building 2540 Fort Monmouth, NJ 07703-5024	Sample Analysis Calibration	987-5370 987-5606	(732) 427-5370 (732) 427-5606
Email: MONM-AMSELSFR@conus.army.mil Message: CDR CECOM FT MONMOUTH NJ // Facsimile on: AMSEL-SF-RER//			992-6403	(732) 532-6403
ARNG	Logistics Maintenance Branch National Guard Bureau Attn: ARNG-ILL-M 111 So. George Mason Dr. Arlington, VA 22204-1382	LOG/MAINT Office Operations Center	327-7730 327-9350	(703) 607-7730 (703) 607-9350
Army Operations Center	Attn: ODC-SOP-S Pentagon Washington, D.C. 20310	Operations Center	227-0218	(703) 697-0218
USACHPPM	Commander, USACHPPM Attn: MCHB-TS-ORF or MCHB-TS-OLO Aberdeen Proving Ground, MD 21010-5403	RF Program Laser Program	584-3353 584-3932	(410) 436-3353 (410) 436-3932

Appendix E
RSO Training Requirements

POSITION	INITIAL TRAINING*	REFRESHER TRAINING*	
SRSO/ASRSO	40-hr CECOM RSO or equivalent	minimum 24-hours every 2 years	24-hr CECOM Operational LRSO Course
CSMS RSO/ALRSO (AN/UDM-2 RADIAC Calibrator)**	40-hr CECOM RSO or U.S. Army Chemical School 4J-F3/4J-F2	minimum 24-hours every 3 years	24-hr CECOM Operational LRSO Course
MATES/UTES CSMS OPTICS LRSO/ALRSO	24-hr CECOM Operational LRSO Course; 40-hr CECOM RSO or equivalent	minimum 24-hours every 4 years	24-hr CECOM Operational LRSO Course
MC-1 LRSO/ALRSO**	40-hr CECOM RSO Course or Chemical School 120-hr 4J-F3/494-F14 Radiological Safety Course or Chemical School 40-hr 4J-F2/494-F9 Operational RSO Course	minimum 24-hours every 3 years	24-hr CECOM Operational LRSO Course
USP&FO LRSO/ALRSO other "Type A" quantity shipper	24-hr CECOM Radioactive Commodity Identification & Transportation (RCIT) Course or equivalent	minimum 24-hours every 2 years	24-hr CECOM Radioactive Commodity Identification & Transportation (RCIT) Course or equivalent
LORAD Industrial X-ray LRSO/ALRSO	80-hr AMCOM RSO Course or Chemical School 4J-F3/494-F14 Radiological Safety Course or 40-hr CECOM LORAD RSO Course	minimum 24-hours every 3 years	24-hr CECOM Operational LRSO Course
Mobile VACIS LRSO/ALRSO	40-hr CECOM RSO Course or SAIC 40-hr Operator and Supplemental RSO Training Course	minimum 24-hours every 3 years	24-hr CECOM Operational LRSO Course
Medical/Dental RSO	MOS qualified or equivalent plus experience	_____	ongoing education/ experience
Unit RSO	Topics: hazards/biological effects of Am-241, Ni-63 and tritium, emergency reporting requirements, measurement and detection of Am-241, Ni-63 and tritium, NRC license conditions. **Unit RSO training can be obtained from the SRSO or the DA RSO website.	_____	ongoing knowledge of TMs/TBs

*Or equivalent training, as approved by the RSSO
** RSOs shipping "Type A" quantities of RAM (i.e., AN/UDM-2, MC-1) must complete RCIT training or equivalent

Appendix F
Radioactive Material Movement Form

CHECK ONE: _____ SHIPMENT _____ RECEIPT				**MOVEMENT NUMBER:_____**		
From:			**To:**			
COMMODITY DESCRIPTION						
Number of Containers	QTY	NSN	Nomenclature	Isotope	Activity	Total Activity
MODE OF SHIPMENT		PHYSICAL CHARACTERISTICS		RADIATION SURVEY RESULTS		
_____ Air _____ Truck _____ Rail _____ Water _____ Parcel Post _____ Other		_____ Special Form _____ Normal Form _____ Solid _____ Liquid _____ Gas		Instrument Used:_____ Calibration Due:_____SN:_____ Transport Index:_____ Surface:_____mrem/hr One Meter: _____ mrem/hr Background:_____mrem/hr		
WIPE TEST RESULTS						
Wipe Taken by:_____ Date:_____		Sample Counted by:_____ Date:_____		Removable: _____ dpm/300 cm^2 LLD: _____ µCi_____ Bq		
BASIC DESCRIPTION						
_____ UN 2911, Radioactive Material, Excepted Package – Instruments & Articles, 7 _____ UN 2910, Radioactive Material, Excepted Package – Limited Quantity of Material, 7 _____ UN 2909, Radioactive Material, Excepted Package – Articles Manufactured from Natural or Depleted Uranium or Natural Thorium, 7 _____ UN 2908, Radioactive Material, Excepted Package - Empty Packaging, 7 _____ UN 3332, Radioactive Material, Type A Package, Special Form, *Non Fissile or Fissile-Excepted*, 7 _____ UN 2915, Radioactive Material, Type A Package, Non-Special Form, *Non-Fissile or Fissile-Excepted*, 7						
Labeling _____ White I _____ Yellow II _____ Yellow III _____ Exempt _____ Handling (IATA) _____ Cargo Aircraft		Marking _____ Radioactive _____ Radioactive LSA _____ UN Number _____ Other (_____) _____ Other (_____)		Shipping Papers _____ Included & Complete ____ Exempt		
24 HOUR EMERGENCY RESPONSE PHONE NUMBER ( ) _____ EACH INSTRUMENT & ARTICLE DOSERATE < 10 mrem\Hr AT 4 INCHES _____ (initial). CERTIFICATION STATEMENT INCLUDED: _____ (INITIAL). COMMENTS:						
Printed Name of RSO or Designee:			Signature:		Date:	

Glossary

Section I
Abbreviations

ALARA
As Low As Is Reasonably Achievable

ALRSO
Alternate Local Radiation Safety Officer

AMC
Army Materiel Command

ANSI
American National Standards Institute

ARA
Army Radiation Authorization

ARNG
Army National Guard

ARP
Army Radiation Permit

ASRSO
Alternate State Radiation Safety Officer

CDE
Chemical Detection Equipment

CECOM LCMC
U.S. Army Communications-Electronics Life-Cycle Management Command

CFR
Code of Federal Regulations

CHPPM
Center for Health Promotion and Preventive Medicine

COTS
Commercial Off-the-Shelf

CRM
Composite Risk Management

CSMS
Combined Support Maintenance Shop

DA
Department of the Army

DAS
Director of the Army Staff

DMIL
Demilitarization

DOD
Department of Defense

DODI
Department of Defense Instruction

DOT
U.S. Department of Transportation

DRMO
Defense Reutilization and Marketing Office

DS/GS
Direct Support/General Support

FCD
Fire Control Devices

FDA
Food and Drug Administration

GL
General License

IATA
International Air Transport Association

ICRI
Individually Controlled Radioactive Item

IM
Item Manager

IRSP
Ionizing Radiation Safety Program

LRSO
Local Radiation Safety Officer

LSO
Laser Safety Officer

MACOM
Major Command

MPE
Maximum Permissible Exposure

MREM/hr
Millirem per hour

MSC
Major Subordinate Command

NGB
National Guard Bureau

NIRSP
Non-ionizing Radiation Safety Program

NRC
U.S. Nuclear Regulatory Commission

NSN
National Stock Number

OD
Optical Density

RACL
Radiation Analysis & Calibration Laboratory

RADIAC
Radiation Detection Indication and Computation

RAM
Radioactive Material

RATTS
Radiation Testing and Tracking System

RF
Radiofrequency

RFSO
Radiofrequency Safety Officer

RSC
Radiation Safety Committee

RSO
Radiation Safety Officer

RSP
Radiation Safety Program

RSSO
Radiation Safety Staff Officer

SOP
Standing Operating Procedures

SRSO
State Radiation Safety Officer

TB
Technical Bulletin

TM
Technical Manuals

UIT
Unique Item Tracking

URSO
Unit Radiation Safety Officer

USACHPPM
U.S. Army Center for Health Promotion and Preventive Medicine

USAJMC
U.S. Army Joint Munitions Command

USAMC
U.S. Army Materiel Command

USPS
U.S. Postal Service

UTES
Unit Training Equipment Sites

Section II
Terms

Accident
Any unintended event, including operating errors, equipment failures or other mishaps, the consequences or potential consequences of which are not negligible from the point of view of radiation safety and/or personnel protection.

Activity *(Radioactivity)*
The number of nuclear transformations occurring in a given quantity of material per unit time. The basic unit of measure is the Becquerel (Bq) or Curie (Ci).

ALARA
Making every reasonable effort to maintain exposures to radiation as far below the dose limits listed in 10 CFR 20 as is practical consistent with the purpose for which the licensed activity is undertaken, taking into account the state of technology, the economics of improvements in relation to state of technology, the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to utilization of nuclear energy and licensed materials in the public interest.

Attenuation
A term used to denote a decrease in the power or energy density level of any electromagnetic radiated field as it passes through an absorbing and/or scattering medium.

Aversion Response

An automatic, reflex-action, response involving closure of the eyelids and/or rotation of the head to look away from and avoid sudden eye exposure to bright light.

Becquerel *(Bq)*

The basic unit of activity. 1 Bq equals 1 disintegration/sec (dps).

Byproduct Material

Any radioactive material (except special nuclear material) yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material.

Controlled Environment

An area where the occupancy and activity of those within is subject to control and accountability as established by an RF safety program for the purpose of protection from RF exposure hazards.

Curie *(Ci)*

A measurement unit of activity (radioactivity). One Ci equals 3.7E10 disintegrations per second.

Electromagnetic Radiation

The propagation of energy in the form of time-varying electric and magnetic fields through space.

General Licensed Item

Any item containing radioactive material that is manufactured by someone licensed under 10 CFR 32 to manufacture and/or distribute general licensed items. Users of general licensed items are subject to the requirements of 10 CFR 31.

Incidental Laser Worker

Individuals working in a laser area whose work make it possible, but unlikely, that they will be exposed to laser energy sufficient to damage their eyes or skin. Examples include laser custodial personnel, military personnel during field exercises, and clerical and supervisory personnel not working directly with laser devices.

Individually Controlled Radioactive Items (ICRI)

Those radioactive items identified in appendix C.

Ionizing radiation-producing devices

Devices that produce ionizing radiation when energized. Examples are x-ray machines, linear accelerators, electron microscopes, cyclotrons, and radiofrequency generators that use klystron, magnetron, or other tubes that produce X-rays.

Ionizing radiation

Any electromagnetic or particulate radiation capable of producing ions, directly or indirectly in its passage through matter. For purposes of this regulation, alpha and beta particles, gamma rays, X-rays, and neutrons are examples of ionizing radiation. Ionizing radiation does not include sound or radio waves, visible, infrared, or ultraviolet light or lasers.

Joule (J)

A unit of energy normally used in describing a single pulsed output of a laser.

Laser

An acronym for Light Amplification by Stimulated Emission to Radiation. It is a source of intense, coherent and directional optical radiation. As used in this regulation, laser denotes either the laser source itself or an entire system encompassing such a source.

Laser Hazard Classification Scheme
The hazard classification scheme is defined by the laser output parameters and is specified in detail in American National Standards Institute (ANSI) Z136.1. The hazards associated with each classification are generally simplified as follows:

a. Class 1 laser devices are typically not capable of emitting hazardous laser radiation. As such, they are exempt from any control measures.

b. Class 2 laser devices are continuous wave, visible laser devices. Momentary exposure occurring in an unintentional viewing situation is not considered hazardous due to the aversion response to bright light sources. Precautions are required to prevent continuous staring into the direct beam and with use of magnifying optics. (NOTE: 2M is used to identify class 2 lasers that are hazardous when viewed with magnification).

c. Class 3 laser devices are subdivided into two classes (3R and 3b); (equivalent to IIIa and IIIb as defined in Title 21 CFR Part 1040). Class 3R lasers are normally not hazardous unless viewed with magnifying optics from within the beam. Class 3b lasers are potentially hazardous under direct or specular reflection viewing conditions, but the diffuse reflection is usually not a hazard.

d. Class 4 laser devices are a hazard to the eye or skin from the direct beam, a specular reflection, and sometimes from a diffuse reflection. A class 4 laser can be a fire hazard.

Laser Safety Officer (LSO)
An individual, designated by the commander, who is qualified by either education or experience to make informed judgments regarding safety control measures needed for laser operations.

Laser Worker
Individuals who routinely work in laser environments. Examples would be research and development personnel, maintenance/repair personnel, system training personnel, and personnel using lasers for medical treatment.

Leak test
Test performed periodically (quarterly, semi-annual, etc.) to verify the physical integrity of a sealed radioactive source.

Licensed material
Source, special nuclear or by-product material received, stored, possessed, used, or transferred under a general or specific license issued by the NRC, an Agreement State, or a DA Radiation Authorization.

Life cycle controls
The composite of all management actions to ensure that the hazards of radioactive material are kept to a minimum. These controls are set for each phase of the life cycle to ensure that the affects of radiation on personnel and the environment are kept within acceptable limits.

Local Radiation Safety Officer (LRSO)
A person appointed by the commander to give advice on the hazard of ionizing radiation and to supply effective ways to control these hazards.

Maximum Permissible Exposure (MPE)
The level of RF/optical/laser radiation to which an individual may be exposed to without incurring a hazardous or harmful effect due to the effects identified in the standard, and with an acceptable safety factor for protection from such effects as described in the standard.

Medical use
The use of radioactive material (by-product, etc.), or the radiation from radioactive material, on humans or animals for diagnostic procedures or treatment.

Microcurie *(uCi)*
One-millionth of curie (3.7E04 disintegrations per second or 2.22E06 disintegrations per minute).

Military-exempt lasers
Those lasers and laser systems that the U.S. Food and Drug Administration has exempted from the provisions of 21 CFR 1040.10 and 1040.11 and of 21 CFR 1002 (except 21 CFR 1002.20) (exemption no. 76-EL-01 DOD). These laser products are used exclusively by DOD components and are designed for actual combat or combat training operations or are classified in the interest of national security.

Monitoring
Routine measurement of the radiation level and/or contamination level of an area, building, room, package or equipment.

Monitoring *(personnel)*
Measuring any part of an individual including the body, external or internal, excretions, or any part of the clothing for the purpose of determining radiation exposure or contamination.

Non-ionizing Radiation
Electromagnetic radiation that does not have enough energy to ionize atoms or molecules.

Optical Density (OD)
A logarithmic expression for the attenuation produced by an attenuating medium, such as an eye protection filter.

Overexposure
Any human exposure to ionizing or non-ionizing radiation that exceeds the established exposure limits.

Qualified person
A person who has had formal training in the following subjects to the level required for the appointed position (See Appendix E).

Radiation Safety Officer (RSO)
A person appointed by the commander to give advice on the hazard of ionizing radiation and non-ionizing radiation, if applicable, and to supply effective ways to control these hazards.

Radiation Safety Program (RSP)
A formal program implemented to ensure the safe use of both ionizing and non-ionizing radiation–producing devices in order to minimize personnel exposure to radiation emitted by these materials and/or devices.

Radiation Safety Staff Officer (RSSO)
An individual appointed by each major Army commander to manage the radiation protection program for the major command.

Radiation Worker
An individual who is actively enrolled in an ionizing radiation monitoring program (i.e., thermoluminescent dosimetry, bioassay, etc.).

Radioactive article
Any manufactured device, such as an instrument, clock, electronic tube, or apparatus, or similar device having radioactive material as a component part.

Radioactive Material Control Point (RMCP)
Any DA element (including the RSSO) that has been designated by a major Army commander to control radioactive items within the command.

Radioactive commodity
An item of Government property composed in whole or in part of radioactive materials.

Radioactive material (RAM)
Any material or combination of materials that emit ionizing radiation. This includes natural elements such as radium, fission by-products, and accelerator produced radionuclides.

Radioactive material (excess)
Consists of any of the following:

a. Property contaminated with radioactive material to the extent that decontamination is economically unsound.

b. Surplus radioactive material whose sale, transfer, or donation is prohibited.

c. Radioactive material that is determined to be unwanted after being identified as surplus.

d. All materials that contain radioactive contamination due to production, possession, or use of radioactive material.

Radiofrequency (RF)
The RF region of the electromagnetic spectrum. It is defined as extending from 3 kHz to 300 GHz.

Radiofrequency Safety Officer (RFSO)
An individual, designated by the commander, who is qualified by either education or experience to make informed judgments regarding safety control measures needed for RF operations.

Restricted Area
An area, access to which is limited by the RSO for the purpose of protecting individuals against undue risks from exposure to radiation and radioactive materials.

Sealed source
Any radioactive material that is permanently bonded or fixed in a capsule or matrix designed to prevent the release or dispersal of such radioactive material under severe conditions. All sealed sources are certified by the U.S. Nuclear Regulatory Commission.

Special nuclear material
Plutonium, uranium-233, uranium enriched in the isotope 233 or in the isotope 235, or any material artificially enriched by any of the foregoing.

Specular Reflection
A mirror-like reflection.

State Radiation Safety Officer (SRSO)
An individual, designated by the commander, who is qualified by education and experience to implement the ionizing and non-ionizing RSPs within the State/Territory for which they are appointed.

Survey
A measure of the radiation incident to the use, storage, handling and shipment of radioactive material or ionizing radiation-producing equipment. The measurement encompasses radiation dose rates and the levels of fixed and removable contamination, as appropriate.

"Type A" package
Packaging that must meet standards testing requirements designed to ensure that the package retains its containment integrity under normal transport conditions. Requirements for Type A packaging are addressed in 49 CFR 173.412

Unit Radiation Safety Officer (URSO)

The RSO in a tactical army unit, typically a company or detachment, appointed to oversee the safe use of chemical detection equipment and/or tritium fire control devices.

Watt (W)
A unit of power equivalent to 1 joule per second. Used principally to describe the output of continuous wave lasers and the output of RF devices.

Wavelength
The distance in the direction of propagation between two successive points of a periodic wave which have the same phase.

Wipe Test
Wiping a surface or piece of equipment with an appropriate filter material for the purpose of identifying and assessing the level of removable contamination present.