

**BY ORDER OF THE COMMANDER,  
16TH SPECIAL OPERATIONS WING (AFSOC)**

**HURLBURTFIELD INSTRUCTION 48-103**

**1 FEBRUARY 2006**

**Aerospace Medicine**

**BASE IONIZING RADIATION  
PROTECTION PROGRAM**



**COMPLIANCE WITH THIS PUBLICATION IS MANDATORY**

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(Major Tiffany J. Morgan)  
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This instruction implements AFDPO 48-1, *Aerospace Medical Program*, and defines guidelines, responsibilities, procedures, and precautionary measures for the control of ionizing radiation sources and emitters. It incorporates the As Low as Reasonably Achievable (ALARA) concept and applies to all Air Force and tenant units on Hurlburt Field that possess or use radioactive materials or radiation producing devices. This instruction does not apply to the exposure of patients by the Medical Service during diagnostic or therapeutic exposures or exposures to personnel by radiation resulting from the employment of nuclear or thermonuclear weapons in combat. Non-ionizing/Radiofrequency radiation and Laser radiation programs are covered under AFOSH Standards 48-9 and 48-10, respectively.

### ***SUMMARY OF REVISIONS***

**This Instruction has been revised in its entirety. It must be completely reviewed for changes and new information.**

Updated all references to AFIERA to AFIOH to reflect name change. Para **4.9.** added Non-Air Force organization responsibilities if bringing radioactive material (RAM) on Hurlburt Field. Para **7.3.** added additional RAM recycling being available through Wright Patterson AFB (WPAFB), OH and requirement to notify Installation Radiation Safety Officer (RSO) if unit is pursuing RAM recycling. Para **11.4.** added non-Air Force organizations requesting RAM usage on Hurlburt Field must obtain written approval from Installation RSO. Para **4.3.7.** amended Installation RSO will make available ALARA training tools. Para **4.3.9.** deleted RSO establishing medical requirements. Para **4.7.7.** amended Workplace supervisors will ensure workers have upon assignment to section initial and annual ALARA training. Para **12.1.** amended Installation RSO will approve radiation safety training class content. Para **12.2.** amended Workplace supervisors will document training on AF Forms 55 or equivalent. Signature block changed to reflect change of command in 16 SOW.

**1. OBJECTIVE.** It is Air Force policy that all exposures to ionizing radiation be ALARA. There should be no exposure to ionizing radiation without an expected benefit and the dose received should be the lowest possible. While the established maximum permissible exposure doses are conservative and offer a low risk of adverse health effects compared to other hazards of life and occupation, it is prudent that every effort be made to reduce exposures to the lowest level that is reasonably achievable and thereby lower the health risk associated with the exposure. This instruction implements ALARA by establishing a comprehensive, coordinated base-wide radiation protection program that incorporates all of the current radiation protection requirements as well as certain additional management concepts and controls specifically designed to maintain exposures to personnel ALARA.

**2. AUTHORITIES/REFERENCES.** This base instruction implements the radiation control policies and requirements contained in:

- 2.1. AFI 48-148, *Ionizing Radiation*.
- 2.2. AFI 40-201, *Managing Radioactive Materials in the US Air Force*.
- 2.3. AFI 48-125, *The US Air Force Personnel Dosimetry Program*.
- 2.4. T.O. 00-110N Series, *Safety and Control Requirements in the Radiation Field*.
- 2.5. 10 CFR, *Energy*.
- 2.6. 21 CFR, *Food and Drugs*.
- 2.7. 49 CFR, *Transportation*.
- 2.8. Department of Defense Instruction (DODI) 6055.8, *Occupational Radiation Protection Program*.
- 2.9. AFI 91-204, *Safety Investigation and Reports*.

**3. DEFINITIONS.**

3.1. ALARA CONCEPT: The ALARA concept is a set of management and administrative actions taken to reduce personnel radiation dose to as low as possible consistent with existing technology, costs, and operational requirements. The ALARA Concept was developed in response to scientific evidence that suggests that no level of radiation exposure is totally risk free.

3.2. RADIATION: This term as used in this regulation refers to all types of ionizing radiation and from any source (radioactive material, mechanical producing devices or emitters).

3.3. RADIATION SAFETY OFFICER (RSO): An individual designated by the commander to manage radiation protection programs. The RSO provides consultation and advice on the hazards associated with radiation and effectiveness of measures to control these hazards. This individual shall be the most technically qualified and experienced person available to assure capability commensurate with the assignment. The term "RSO" is a functional title and is not intended to denote a commissioned status or a job classification within the Air Force. There are three distinct categories of RSOs at Hurlburt Field:

3.3.1. INSTALLATION RSO: An individual designated by the installation commander to manage the Installation Radiation Protection Program. This individual will usually be the base bioenviron-

mental engineer or a senior bioenvironmental engineering technician (AFSC 4B0X1) with experience subject to approval by the USAF Radioisotope Committee.

3.3.2. UNIT RSO: An individual designated by the unit commander to act as the single focal point for the unit on radiation protection matters. Each operational unit that uses or operates radiation producing devices or materials will appoint, in writing, a unit RSO.

3.3.3. PERMIT or LICENSE RSO: An individual designated by the unit commander and approved by the USAF Radioisotope Committee or Nuclear Regulatory Commission (NRC) to manage the radiation protection aspects associated with the use of radioactive materials for which a specific USAF Radioactive Material Permit or an NRC License has been issued.

3.3.4. IONIZING RADIATION: Electromagnetic radiation which may cause ionization within cells or tissues of the body. Alpha and beta particles, gamma rays, x-rays and neutrons are examples of types of ionizing radiation.

#### 4. RESPONSIBILITIES.

4.1. The Commander, 16th Special Operations Wing, has the ultimate responsibility for the Base Radiation Program.

4.2. The Commander, 16th Medical Group will:

4.2.1. Oversee the conduct of medical examinations required by Air Force instructions and AFOSH Standards. Assist the Air Force Institute for Operational Health (AFIOH) as required; assuring patients receive required referral or follow-up examinations.

4.2.2. Ensure all reported incidents of suspected or alleged radiation overexposure are reported to and investigated by Bioenvironmental Engineering and the results of such investigations are properly documented by Public Health.

4.3. Installation RSO (Bioenvironmental Engineer) will:

4.3.1. Conduct the base wide radiation protection program, which includes surveillance of all radioactive materials and radiation producing devices.

4.3.2. Coordinate and assist unit RSOs as necessary to ensure a comprehensive, coordinated radiation protection program.

4.3.3. Perform initial and periodic hazard evaluations of all radiation sources or modifications as needed. Define health hazards, hazardous areas, and recommend proper control measures to commanders and users.

4.3.4. Compile and keep a current inventory of Air Force owned and operated radiation sources on base.

4.3.5. Operate the Base Personnel Dosimetry Program. Issue personnel dosimeters and review all results.

4.3.6. Conduct or arrange for investigations of alleged personnel overexposure to radiation.

4.3.7. Make available ALARA training tools to supervisors of personnel who use or operate radiation sources.

- 4.3.8. Provide briefings and other health education consultations concerning radiation when requested by unit RSOs and commanders. Provide initial ionizing radiation education.
- 4.3.9. Review annually this program, individual unit permit programs, and periodically areas that use radiation producing devices or radioactive material. This review should include proper worker and public dose assessments to include monitoring, calculations and a report sent to each section.
- 4.3.10. Ensure key base agencies (e.g., base commander, fire department, civil engineering readiness flight chiefs, etc.) are informed of authorized uses of radioactive material (RAM) on the installation annually.
- 4.3.11. Brief annually to wing leadership the status of the base radiation protection program at the wing's quarterly Air Force Occupational Safety and Health Council.
- 4.4. Public Health Section will:
- 4.4.1. Start action to investigate alleged or suspected radiation overexposures. Prepare and distribute AF Form 190, *Occupational Illness/Injury Report*, and additional documentation as appropriate for all incidents of alleged personnel exposure to radiation as outlined in AFI 48-101, *Aerospace Medical Operations*.
- 4.4.2. Provide ionizing/non-ionizing radiation briefings to pregnant individuals.
- 4.5. Unit Commanders. Unit commanders owning or using radiation sources or material will:
- 4.5.1. Appoint a unit RSO for their organization. Forward a copy of the appointment letter to the 16th Medical Group/Bioenvironmental Engineering (16 MDOS/SGOAPB).
- 4.5.2. Enforce radiation protection policies and programs outlined in this regulation.
- 4.5.3. Ensure unit Operating Instructions (OIs) are published which identify and delineate location, hazards, and control procedures for radiation emitters or sources to limit personnel access to potentially hazardous areas.
- 4.5.4. Ensure incidents involving potential overexposure of personnel are reported and investigated.
- 4.5.5. Ensure periodic training is given to workers about radiation hazards, safety procedures, and actions to be taken in the event of accidental overexposure.
- 4.5.6. Ensure a quality assurance program is implemented for radiation safety.
- 4.6. Unit RSOs will:
- 4.6.1. Perform periodic visits to all work areas in their organizations that use or operate radiation sources to verify safety and health control requirements, warning devices, procedure controls, maintenance of documentation, and inventory by user.
- 4.6.2. Act as a single point of contact for the unit on radiation safety matters and maintain active liaison with the Bioenvironmental Engineering and Public Health personnel.
- 4.6.3. Ensure all newly assigned personnel whose duties involve ionizing radiation are immediately reported to the Installation RSO for entry into the personal dosimetry program.
- 4.6.4. Ensure a quality assurance program is implemented for radiation safety.
- 4.7. Supervisors of personnel using or working on radiation sources or in radiation areas will:

- 4.7.1. Write OIs which delineate safety and health precautions when operating or using radiation sources as specified in hazard evaluations. The OIs shall include management and administration action to keep radiation exposures ALARA and procedures for reporting an overexposure.
  - 4.7.2. Maintain an inventory of all radiation sources which shows receipt, quantities on hand, and items disposed. Notify the installation and unit RSO of any changes or modification to equipment, parameters or facility in writing.
  - 4.7.3. Maintain documentation and evaluation reports on hand.
  - 4.7.4. Comply with all operating, storage, disposal, and shipping guidance in this regulation.
  - 4.7.5. Make sure workers under their supervision follow procedures published in Technical Orders and manuals, unit OIs, etc. for protection of personnel from overexposure to radiation.
  - 4.7.6. Ensure personnel do their work in the way that keeps their exposure to radiation ALARA and in all cases below the permissible exposure limits (PELs).
  - 4.7.7. Ensure workers are properly trained in safe work practices and are told about specific hazards in their work place and the procedures to be followed to avoid those hazards. The supervisor must maintain all training documentation and lesson plans as well as properly annotate on the individual's AF Form 55.
  - 4.7.8. Ensure any suspected or alleged overexposures are immediately reported to the installation and unit RSO, unit commander, and the Public Health Section and those persons involved are promptly transported to the medical facility for examination.
  - 4.7.9. Maintain a current copy of this HFI.
- 4.8. Individuals using or working on radiation sources or in radiation areas. These persons have a responsibility to protect themselves and their fellow workers from possible harm from radiation by:
- 4.8.1. Following procedures for safe work given in equipment technical orders and manuals, unit OIs, etc.
  - 4.8.2. Making sure required warning signs and safety devices are in place or properly set before beginning work and that everyone understands the procedures and signals to be used for the task being done.
- 4.9. Non-Air Force organizations will: abide with *AFI 40-201, Managing Radioactive Materials in the USAF*, to include obtaining written approval from the installation RSO at DSN 641-1820/1822 or Comm 850-881-1820/1822 before they bring new sources on base. Paragraph 11. outlines specific requirements.

**5. USAF RADIOACTIVE MATERIAL PERMITS.** A single broad scope NRC license has been issued to the USAF Radioisotope Committee (HQ AFMOA/SGOR). The committee is the sole authority within the Air Force to approve and control use, possession, receipt, transfer and disposal of all radioactive materials for which the NRC has jurisdiction.

- 5.1. Permit Procedures. The application procedures for renewal, amendment, and new permits will follow the procedures outlined in *AFI 40-201, Managing Radioactive Materials in the Air Force*. Those organizations making application for authority to use, process, receive, transfer, or dispose of radioactive material which are licensable materials (10 CFR 30) will continue to submit applications

using appropriate NRC forms and NRC Regulatory guides. Applications will be reviewed and approved or disapproved by the USAF Radioisotope Committee. The Installation RSO will be the focal point for all permit activities on Hurlburt Field.

5.2. Inventory/Control Procedures. Specific inventory requirements and health and safety precautions contained in the USAF Permit will be complied with by the using agency. An inventory of the material will be maintained by the using agency and will be conducted IAW the RAM permit or at least semi-annually. Permitted radioactive materials in Base Supply possession will be inventoried and controlled by an appointed Supply RSO. All receipts, transfer and disposal of radioactive material will be annotated on the inventory. A radiation protection survey will be conducted at least annually by the Installation RSO to assure compliance with applicable regulations. Swipe/leak tests will be performed by the user IAW the RAM Permit. Results are maintained by the user and reviewed by the Installation RSO.

5.3. Documentation. All documentation concerning the radioactive material will be maintained by the using organization until actual elimination by the using organization and for at least 3 years thereafter. Termination of use and/or permit does not relieve the user of documentation requirements.

5.4. Loss of Material. Notification of accidents and/or incidents which were reportable to the NRC will now be reported to the USAF Radioisotope Committee. The committee will provide the required notification to the NRC as necessary.

## **6. RADIOACTIVE MATERIAL RECEIPT, STORAGE, SHIPMENT AND LABELING.**

### **6.1. Receiving.**

6.1.1. Upon receipt of radioactive material or commodities containing radioisotopes, the permit licensee or the source of supply which received the material will contact Bioenvironmental Engineer, to perform appropriate swipe tests and radiation monitoring of the received item. If the package is labeled as White I, Yellow II or Yellow III, they need to be monitored within 3 hours. Bioenvironmental Engineering can be contacted at 881-1820/1822. (Reference: 10 CFR 20.1906).

6.1.2. The container should be visually inspected and labeled with Air Force Technical Order (AFTO) Form 9B (AFI 40-201). The properly packaged and labeled radioactive material should be forwarded immediately to the using organization or storage area as applicable.

6.1.3. Isolate the container and notify the unit and installation RSO if the shipments are received damaged, or if seals are broken or tampered with. Discrepancies will be reported as outlined in T.O. 00-110N-3.

6.2. Storage. Radioactive materials will be stored in secured and identified areas approved by Bioenvironmental Engineering (BE). All commodities which contain radioactive material will be labeled IAW AFI 40-201. Provisions must be made to preclude unauthorized removal of radioactive material or items. Photographic film will not be stored at distances of less than 50 feet from any quantity of any radioactive material.

6.2.1. Unrestricted Storage Area. Area where the radiation intensity at one foot from any single container or item in storage configuration does not exceed 2 mR/hr. The installation RSO will perform annual radiation protection surveys in these areas.

6.2.2. Restricted Storage Area. Area where the radiation intensity is in excess of 2 mR/hr at one foot from any single container or item in the storage configuration. The installation RSO will per-

form quarterly radiation protection surveys in these areas. The interior and exterior of each restricted area must be posted with appropriate AFTO placards outlined in AFI 40-201.

6.3. Shipping. Commodities containing radioactive material will not be consolidated with other materials for shipment since radioactive items are designated as "hazardous". Contact the installation RSO to determine if a particular commodity contains radioactive material. Items must be shipped in accordance with DOT regulations. Chain of custody must be strictly enforced.

6.4. Marking and Identification. All commodities, packages, containers, work and storage areas containing radioactive material must be identified. Requirements for radioactive material warning labels and placing of placards are outlined in AFI 40-201.

6.5. Documentation. All base agencies storing or using commodities containing radioactive material will maintain logs indicating all items received, stored or transferred. All radiation protection survey reports and swipe sample results will be maintained on file by the using agency and reviewed by the installation RSO.

**7. RADIOACTIVE WASTE DISPOSAL.** This is an extremely sensitive issue and is of great concern to the general population, state and federal regulatory agencies and the Department of Defense. Even minor infractions of the Department of Transportation (DOT), NRC, Environmental Protection Agency (EPA), State or local regulations can mean adverse public reaction, possible legal action (fines and imprisonment), and suspension of the use of the commercial radioactive material burial sites.

7.1. Requirements. Specific procedures for radioactive waste disposal are found in Titles 10 and 49 of the Code of Federal Regulations or by contacting, through the installation RSO, the AFIOH/SDRH (AFRMWO), 2402 E Drive, Brooks City-Base, TX 78235-5114, USAF Radioisotope Committee, or HQ AFMOA/SGZR, 110 Luke Ave., Room 405, Bolling AFB, DC 20332-7050. ALL DISPOSAL ACTIONS WILL BE COORDINATED THROUGH THE INSTALLATION RSO. General requirements for radioactive wastes are listed below:

7.1.1. AFIOH/SDRH (AFRMWO) has the responsibility for managing the Air Force Radioactive Waste Disposal Program. Procedures for disposal are contained in AFI 40-201.

7.1.2. All radioactive waste disposal actions must be processed through AFIOH/SDRH (AFRMWO), Brooks City-Base, TX (see [Attachment 1](#) for requirements). There are no exceptions to this policy. Specific guidance and instructions for disposal will be provided by AFIOH/SDRH.

7.1.3. No Air Force agency may enter into a radioactive waste disposal contract or agreement without approval of AFIOH/SDRH.

7.1.4. Waste containers used for radioactive waste disposal shipments must be clean, free of corrosion, and be of an approved DOT type. Rust that is evident on or in barrels could be subjected to puncture and will preclude the use of the container.

7.2. Electron Tube Disposal. Licensed items containing radioactive material must be disposed of as radioactive waste in accordance with 10 CFR Part 20. Section 30.15 of 10 CFR lists items that are exempt from licensing requirements and are, therefore, exempt from regulations pertaining to receiving, processing and disposal. Electron tubes are listed among the exemptions provided certain levels of activity and measurable radiation defined in Section 30.15 are not exceeded. Even though exempted electron tubes may be disposed as ordinary refuse as outlined in T.O. 00-110N-7 in most

states, the state of Florida and the Nuclear Regulatory Commission encourage using any established avenues for disposal. Therefore, Hurlburt Field will utilize the Air Force Radioactive and Mixed Waste Office for disposal of all electron tubes without exception (See [Attachment 1](#)).

7.2.1. Contact the Hazardous Material Pharmacy (884-1771) to coordinate drop off of unserviceable or expired electron tubes. The unserviceable electron tube should be placed in the replacement tube's container and delivered to the Hazardous Material Pharmacy (Bldg 90720). Do not break the tube nor accumulate electron tubes.

7.2.2. Disposal of exempt items containing radioactive material does not relieve the user from the documentation requirements for radioactive wastes.

7.2.3. Waste Documentation. Meticulous records (disposal log) must be maintained by each generating agency or user on the type of radioactive material and chemical form placed in the waste containers. Additionally, each generating unit must submit a form letter (see example in [Attachment 2](#)) through Bioenvironmental Engineering (Bldg 91041) prior to delivering the unserviceable/expired electron tubes to the Hazardous Material Pharmacy. The disposal log and form letter must include activity, chemical form, chemical composition of waste, whether neutralization has been performed, pH, etc. This log must be maintained on hand at all times as inspectors will physically inspect storage areas, disposal containers, and match disposal and shipping records.

7.3. Some low level radioactive materials can be recycled through the 88 ABW Environmental Management, Radiation Safety Office at WPAFB. This can be done by submitting a request form at the RAM Recycling website: <http://www.abwem.wpafb.af.mil/radiation/ramrequest.cfm>. Units and organizations who opt to recycle their items shall notify the Hurlburt Field Installation RSO of the unit's request to WPAFB by phone at DSN 641-1822.

**8. INDUSTRIAL, MEDICAL AND DENTAL X-RAY UNITS.** All equipment capable of producing x-rays must be monitored for potential exposure to workers and the public. The Installation RSO will maintain an inventory of all equipment and perform annual x-ray scatter evaluations of all work areas, which require it. These assessments will be maintained on file by the Installation RSO as well as by the shop supervisor. The AFIOH Ionizing Radiation Section will be contacted to perform radiation protection surveys for initial installation and after major repairs of x-ray equipment.

8.1. Industrial X-ray Units. Procedures for Non-Destructive Inspection (NDI) facilities (shielded and unshielded operations) must be evaluated annually by the Installation RSO to assure compliance with T.O. 33B-1-1.

8.2. Medical and Dental Units. The Installation RSO will evaluate these units annually to assure all safety and health precautions are enforced by the user.

8.3. Testing of Protective Clothing. All leaded gloves, aprons and gonadal shields must be inspected at least annually for safety defects by the using agency. Radiographic inspection must be used when visual inspection detects cracks or defects.

8.3.1. Defective items should be removed from use and replaced. Document the annual inspection in a logbook or by a letter. The documentation should reflect the local identification number for the item, date of inspection and any findings.

**9. BASE PERSONAL DOSIMETRY PROGRAM.** All people whose occupation involves the operation of x-ray equipment or handling of radioactive material run the risk of occupational exposure to ioniz-

ing radiation. A monitoring device must be issued, with concurrence with the installation RSO, to each person (military and civilian) who, exclusive of background or medical radiation, is at risk of receiving occupational exposure to ionizing radiation. Specific risk criteria and exposure levels are outlined in AFI 48-125.

9.1. The primary monitoring device for use in determining occupational exposure to ionizing radiation on any Air Force installation is the Thermoluminescent Dosimeter (TLD). The TLD must be worn by the individual while performing any task involving potential exposure to ionizing radiation. When not in use, the dosimeter must be kept in appropriate storage areas. When in use, the "whole body" badge should be worn between the chest and the hips. A whole body badge should never be worn on the collar as a separate collar badge is issued for this purpose. When issued a collar and a whole body badge, both badges must be worn at all times.

9.2. Issuance of Personnel Dosimeters. The Bioenvironmental Engineering Office, 16th Medical Group, is responsible for the operation of the USAF Personal Dosimetry Program on Hurlburt Field. TLDs may be obtained at any time. All records will be maintained by this section. Master records will be maintained in the individual's medical record.

9.3. Pregnant Female Policy. The individual's supervisor or physician may restrict a pregnant female's duties involving radiation. There is no blanket policy to remove them from radiation duties. Each pregnancy is handled on a case-by-case basis depending upon their potential to receive radiation exposure. The installation bioenvironmental engineer is responsible for evaluating potential exposure that could be received by a pregnant female working in a radiation area.

9.3.1. Individual can continue in radiation duties if it is unlikely that the worker will receive a radiation exposure in excess of 500 mRem (5 mSv) during the term of the pregnancy (including the period preceding confirmation of her pregnancy).

9.3.2. Restrict individual's specific duties contributing to significant exposures if it is likely that the worker would receive a total whole body dose during pregnancy exceeding 500 mRem (5 mSv). This may result in total removal from radiation duties or only partial removal.

9.3.2.1. Pregnant females will be placed on monthly dosimetry and the base involved will be notified of the results within 24 hours of receipt of the dosimeters by AFIOH.

9.3.2.2. Pregnant workers who work with high output sources such as medical therapy, industrial radiography, or radioactive materials other than sealed sources, require waiver from AFMOA to continue duties.

9.4. Deploying Personnel Enrolled in the Base Personnel Dosimetry Program: Deploying personnel **MUST** stop by Bioenvironmental Engineering (Bldg 91020) to pick up a designated transit control badge to accompany their current TLD badge for use on the deployment. If the deployment extends beyond the quarterly timeframe, immediately upon return, the deployed personnel will need to contact the TLD program manager to return the old badge and get a new one. The TLD program manager will write the dates that the badge was issued and returned and ship the badge as certified mail to AFIOH/SDRD as soon as possible.

9.5. Thermoluminescent Dosimeter (TLD) Action Levels. The Bioenvironmental Engineering will review all TLD results for each work area. The RSO will establish ALARA action levels for each monitored area dependent upon frequency and exposure potential of radiation duties. Action will be taken as described below:

9.5.1. Investigation Action Level. Listing 1499 will be reviewed monthly. If any person receives a result in excess of established ALARA levels for the month, or quarter, an investigation will be initiated. Results will be annotated on the form as well as the AF Form 2754 in the shop folder. A memo for record or a formal report will be written as necessary when recommended corrective action is deemed appropriate for reducing monthly exposure levels.

9.5.2. Abnormal Exposure Level. A formal investigation to determine the cause of the exposure must be made IAW AFI 48-125. The abnormal exposure level is 417 mRem (.417 mSv) on a monthly TLD and 1250 mRem (1.25 mSv) on a quarterly TLD for whole body dose equivalent.

9.5.3. Overexposure Action Level. Formal investigation and documentation is required for any radiation exposure in excess of the limits described below: (Ref 10 CFR Part 20).

9.5.3.1. 5 Rem (0.05 Sv) in any calendar year accumulated dose to the body, head and trunk, active blood forming organs, gonads or lens of the eye or 5(N-18) Rem total lifetime accumulated dose where N is equal to the individual's age.

9.5.3.2. 12.5 Rem (0.125 Sv) in any calendar quarter accumulated dose to the skin of the whole body or thyroid, or 50 Rem (.5 Sv) in any calendar year.

9.5.3.3. 12.5 Rem (0.125 Sv) in any calendar quarter accumulated dose to the hands and forearms, or the feet and ankles, or 50 Rem (.5 Sv) in any calendar year.

9.5.4. Pregnant Female Action Level. Personnel dosimetry results which if continued for the term of pregnancy would exceed the 500 mRem (5 mSv) exposure limit for the fetus. This action level corresponds to 50 mRem (.5 mSv) on a monthly TLD for whole body dose equivalent. If excessive dosimeter results are received, investigate and report results to the Base RSO and the Aeromedical Council.

9.5.5. Accident and Overexposure Reporting Procedures. All accidents and overexposures to ionizing radiation will be reported to the Base RSO. The Base RSO will initiate action to investigate the alleged incident IAW AFI 48-125. Results of the investigation must be documented and filed accordingly. Medical exams will be arranged by the Public Health Section. All results will be reported to the individual, the shop supervisor, unit commander, Aerospace Medicine Council and HQ AFSOC as appropriate.

## 10. REVIEW OF RADIATION FACILITY/SOURCE INSTALLATION PLANS.

10.1. Review of Construction and Facility Maintenance. All plans for modification of facilities or design of new facilities which involve the use of radioactive material or radiation producing devices must be reviewed by the unit/installation RSO to assure that ALARA is considered.

10.2. Procedures. The user will notify the RSOs in writing of all changes and modifications, plans to procure and install new or replacement equipment, etc.

10.2.1. The RSO will document all reviews and include any recommendations on procedures that will help prevent overexposure and keep personnel exposure ALARA.

10.2.2. The Installation RSO will contact the AFIOH, Radiation Services Division, Brooks City-Base, TX for design reviews which are beyond the technical capability of the Installation RSO.

10.2.3. The Installation RSO will perform a review of the proposed changes to determine any requirements, procedure changes, and equipment modifications that will prevent personnel exposure to radiation and keep exposure ALARA.

10.2.4. Use of Radioluminescent Signs.

10.2.4.1. Limited to locations where electrical power is either not available or is economically prohibitive.

10.2.4.2. Each proposed use or application must be forwarded through HQ AFSOC/SGPB to the USAF Radioisotope Committee for approval.

10.2.4.3. Radioluminescent sign installed or purchased for installation prior to 11 March 1986 may be used until they no longer provide adequate light. When disposal is necessary, these signs should be returned to the manufacturer. The manufacturer's general license requires they provide proper disposal.

10.2.4.4. The Installation RSO will locate and maintain a written inventory of all existing exit signs. The inventory will be reviewed annually and updated to ensure proper disposal of the signs.

**11. NON-AIR FORCE ORGANIZATION USE OF RADIOACTIVE MATERIAL ON HURLBURT FIELD.** Prior to any non-Air Force organization use of RAM on Hurlburt Field, the non-Air Force organization must obtain written approval from the Installation RSO at least 30 days in advance of RAM arrival on base. For contractors, the requirements must be included in the statement of work. Written approval is considered and may be granted once the following information is provided to the Installation RSO (16 MDOS/SGOAPB at 881-1820/1822):

11.1. All requests must be in writing.

11.2. A brief description of proposed activities.

11.3. Evidence of a valid NRC or Agreement State Radioactive Material License.

11.4. A copy of an NRC Form 241, or a similar document, listing the specific licensable items and their use locations. The license must either specifically list the installation or grant approval for work at temporary job sites anywhere in the United States where the NRC or Agreement State has jurisdiction. EXCEPTION: Contractors using generally licensed materials (e.g. certain NITON Lead Paint Analyzers) and DoE or DoE prime contractors operating in accordance with 10 CFR Part 835 do not require an NRC license or NRC Form 241 for NARM.

11.5. Proof of a valid Air Force contract with inclusive dates of work.

11.6. The name, local address and telephone number for the responsible local representative and the name, address and telephone number of the RSO named on their license.

11.7. An acknowledgement that the installation RSO can make periodic checks to ensure that contractor personnel follow radiation safety practices to prevent exposures to Air Force personnel and avoid contamination of government property. In addition, the installation RSO must have authority to suspend contractor operations believed to be unsafe.

11.8. Agreement State licensees using NRC regulated materials must supply a copy of the NRC Form 241 approved by the installation's NRC region according to 10 CFR Part 150.20. The form must spec-

ify the correct locations and dates of performance of licensed activities. State licensees may not work on Air Force or other installations where exclusive federal jurisdiction exists for more than 180 calendar days/calendar year without first getting an NRC license.

11.9. Non-Air Force organizations that do not have an NRC or Agreement State License with current NRC Form 241 and who are not DoE or DoE prime contractors exempted from Licensing must contact AFMOA/SGOR from guidance and approval to use RAM on an Air Force installation.

**12. PERSONNEL TRAINING.** All individuals working in or frequenting any portion of an area where radioactive material or radiation producing devices are used must receive initial and annual radiation protection training. Initial training will be conducted before or as soon as possible after assignment to work areas involving radiation exposure. Annual refresher training will be conducted to reemphasize and reinforce training objectives.

12.1. Training Requirements. The Installation RSO will approve the radiation safety training class content. Course content and instruction will include:

12.1.1. Risk from radiation exposure.

12.1.2. Potential overexposure reporting procedures.

12.1.3. Maximum permissible dose limits.

12.1.4. Protective measures required. This should be tailored to specific radiation work.

12.2. Documentation. Training documentation will be maintained locally by workplace supervisors on AF Form 55 or equivalent.

**13. QUALITY CONTROL PROGRAM.** The Installation RSO will conduct quality assurance review of the radiation protection program to include:

13.1. Monthly review of personnel dosimetry results to ensure overexposure, abnormal exposure, investigation and pregnant female action levels have not been exceeded. Personnel dosimetry results above the specific action level should be investigated and the results of the investigation reported to the Aerospace Medicine Council.

13.2. Personnel dosimetry results for pregnant female workers will be reviewed monthly and documentation maintained on all actions taken to ensure that the total dose to the fetus does not exceed 500 mRem (5 mSv) during the term of pregnancy. Positive efforts should be made to limit the dose to no more than 50 mRem (0.5 mSv) per month.

13.3. Annual radiation protection program reviews will be accomplished and documented. The results will be presented to the Aerospace Medicine Council and the Air Force Occupational Safety and Health Council. The reviews will include:

13.3.1. A review of all personnel dosimetry results for the previous year to ensure trends are noted and all personnel dosimetry results which exceed action levels have been investigated.

13.3.2. All radiation protection survey results for the previous year to ensure all required surveys have been performed, documented properly, and that corrective action, if necessary, has been accomplished.

13.4. Annual radiation protection program requirements will be reviewed and documented.

**14. SURVEYS.** The Installation RSO or delegated alternate will conduct routine surveys and schedule shielding surveys. The RSO will conduct special surveys at the request of using organizations. For these special surveys, contact 16 MDOS/SGOAPB Bioenvironmental Engineering, by telephone at DSN 641-1820/1822 and follow up with a written request. Types of surveys are:

- 14.1. Probe surveys that use portable survey meters to detect alpha, beta, gamma, neutrons, or x-rays.
- 14.2. As part of probe surveys a public and general dose assessment will be performed and documented in the appropriate file, i.e. either in a permit binder or casefile, by Hurlburt Field Bioenvironmental Engineering.
- 14.3. Swipe sample surveys which use filter paper to smear suspected contaminated areas.
- 14.4. Evaluation of procedures, materials, and documentation.

**15. LEAK TESTING SEALED SOURCES.** Each sealed source acquired from another person or organization (containing by-product material or any other radioactive material with a half-life greater than 30 days and in any form other than gas) will be tested for contamination and leakage before use.

- 15.1. In the absence of a certificate from a transfer indicating that a test had been made within six months prior to the transfer, the sealed source will not be put in use until tested.
- 15.2. The test will be capable of detecting the presence of 0.005 microcuries or more of radioactive material on the test sample.
- 15.3. Unless otherwise specified, the permittee is responsible for swipe sampling as specified; or, if not specified, the surfaces of the device in which the sealed source is permanently or semi-permanently mounted or stored where one might expect contamination to accumulate will be swiped. Use filter paper as required to swipe the source. Depending upon the type and quantity of radioactive material being tested; tweezers, hemostats, or other remote handling devices will be used to hold the swipe sample during the swipe. Forward by mail the leak test swab or filter paper in an enclosed envelope to the AFIOH/SDRH 2402 E Drive, Brooks City-Base, TX 78235 for analysis.
- 15.4. Each sealed source that the permittee uses (containing byproduct material or any other radioactive material with a half-life greater than 30 days and in any form other than gas) will be tested for leakage and contamination at intervals of six months, unless otherwise specified in the permit. Exception--each sealed source designed for the purpose of emitting alpha particles will be tested at intervals of three months.
- 15.5. If the above tests reveal the presence of 0.005 microcuries or more of removable contamination, the permittee will immediately withdraw the sealed source from use and make arrangements for it to be decontaminated and repaired or disposed of in accordance with the waste disposal procedure contained in the permit or in accordance with the CFR.
- 15.6. Sources are to be leak tested before going to storage and before being taken out of storage.

**16. OFF-DUTY EMPLOYMENT.** Any individual enrolled in a TLD program off-base must provide copies of their exposure reports to the Installation RSO within 1 week of report receipt.

**17. RECORDS MANAGEMENT.** All records generated by this instruction will be maintained IAW AFI 37-138, *Records Disposition-Procedures and Responsibilities*.

PAUL R. HARMON, Colonel, USAF  
Commander

**Attachment 1****DISPOSAL OF TRANSFER OF AIR FORCE EXCESS RADIOACTIVE MATERIALS****A1.1. PURPOSE.**

A1.1.1. The purpose of this procedure is to provide Air Force personnel with guidance for disposing and/or transfer of ERM to the consolidation facility at Brooks City-Base, or direct disposal (under AFRMWO guidance) from the generator.

**A1.2. REQUIRED INFORMATION.**

A1.2.1. In order to initiate disposal of any ERM and receive shipping instructions, the following information must be collected and provided to the AFRMWO:

A1.2.2. National stock number, if available (if not available, use the next higher assembly with which the item was used):

A1.2.2.1. Nomenclature/item description/specification.

A1.2.2.2. Quantity.

A1.2.2.3. Radionuclide (e.g., Ra-226, U-238).

A1.2.2.4. Physical form (e.g., special form, normal form [solid, gas, liquid]).

A1.2.2.5. Chemical form (e.g., uranium metal, thorium nitrate).

A1.2.2.6. Activity (e.g., Bq and Ci units).

A1.2.2.7. Date of source/material manufacture (if available).

A1.2.2.8. Activity per container, if ERM are bulk packaged.

A1.2.2.9. Radiation intensity on contact and at 1-meter from packaged item (e.g., mR/hr).

A1.2.2.10. Full mailing address and phone number of requesting activity/point of contact..

A1.2.2.11. The installation Radiation Office will review for completeness and approve the request by first endorsement to AFRMWO.

***NOTE: 1. Disposal/Transfer requests, in letterform, must contain all the information described in Section 2.0 and sent to:***

AFIOH/SDRE (AFRMWO)

2350 Gillingham

Brooks City-Base, TX 78235-5114

The request can also be faxed to DSN: 240-3726 or COM: (210) 536-3726.

***NOTE: 2. Electronic mail (email) requests are not acceptable substitutes. Requests must be in writing and signed by the RSO.***

**A1.3. RECEIPT OF REQUEST.**

A1.3.1. After a request is received by the AFRMWO, it is reviewed for applicability and completeness. If deemed complete, the request is assigned a control number. A letter will be generated with appropriate instructions if the item can be accepted at the Brooks Consolidation Facility.

**A1.4. CONTRACTED REQUESTS.**

A1.4.1. When the ERM is a very large shipment or an isotope that is outside the scope of the Brooks Consolidation Facility's permit, the request will be placed on contract. The request will be sent to the Operation Support Command at Rock Island, IL. There, the contractor will be hired and assigned for pick-up of the radioactive material.

**Attachment 2**

**(SAMPLE DISPOSITION REQUEST LETTER)**

**Date**

MEMORANDUM FOR AFIOH/SDRE (AFRMWO)

2350 Gillingham Drive

Brooks City-Base, TX 78235-5111

FROM:

Unit/Office Symbol

Street Address

Hurlburt Field FL 32544

SUBJECT: Request for Shipping Instructions for Radioactive Materials

**A2.1.** The Insert Unit has collected radioactive materials that have been marked for disposal. The following information is submitted with a request for shipping instructions.

- A2.1.1. NSN: 6665-01-120-5978.
- A2.1.2. Nomenclature: Test Source for AN/PDR-27G.
- A2.1.3. Specification #: NR.
- A2.1.4. Quantity: 1 (One).
- A2.1.5. Radionuclide: RA-226.
- A2.1.6. Physical Form: NORM SOL.
- A2.1.7. Chemical Form: Solid.
- A2.1.8. Activity per item: 7 uCi.
- A2.1.9. Date of Manufacture: 6/87.
- A2.1.10. Radiation Intensity on contact of packaged items: 0 CPM.
- A2.1.11. Radiation Intensity at 10 cm (4 inches) from packaged items: 0 CPM.
- A2.1.12. Survey Meter: ADM 300A S/N E9724, Calibrated 11 Jun 01.
- A2.1.13. Mailing Address and Telephone.
- A2.1.14. Unit.
- A2.1.15. Street Address.
- A2.1.16. Hurlburt Field FL 32544

A2.1.17. DSN: 641-XXXX.

A2.1.18. Attn: Insert Shop POC's Name.

**A2.2.** Any questions you have may be directed to MSG BeeTech at the above listed number.

//SIGNED//

Insert Shop POC's Name

Insert Shop POC's Title

1st Ind to Insert Unit/Office Symbol, Insert 1st pg date, Request for Shipping Instructions for Radioactive Materials

16 MDOS/SGOAPB

MEMORANDUM FOR AFRMWO

I concur with this request. Please process at your earliest convenience.

Installation RSO's Signature Block

Installation Radiation Safety Officer