BY ORDER OF THE COMMANDER,
35TH FIGHTER WING

35 FW INSTRUCTION 48-101

16 SEPTEMBER 2004

Aerospace Medicine

BASE RADIATION SAFETY PROGRAM

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

NOTICE: This publication is available digitally on the AFDPO WWW site at: **http://www.e-publishing.af.mil.**

OPR: 35 AMDS/SGPB (Capt William Belser) Certified by: 35 MDG/CC (Col Bryan Funke)
Supersedes FWI 48-101, 3 September 2000 Pages: 13
Distribution: F

This instruction implements AFI 48-148, *Ionizing Radiation Protection*, provisions of AFOSHSTD 48-9, *Radio Frequency Radiation Safety Program*, and provisions of AFOSHSTD 48-139, *Laser Radiation Protection Program*. This instruction prescribes the precautionary measures and procedures for requisitioning, handling, storing, using, and disposing of radioactive materials and ionizing and non-ionizing radiation producing machines. It applies to all Misawa Air Base (MAB) personnel, contractors, and tenant organizations on MAB and other operating locations controlled by MAB using radioactive material or radiation producing machines.

SUMMARY OF REVISIONS

This document is substantially revised and must be completely reviewed. This revision updates the current 35 FW Instruction in accordance with AFI 40-201, *Managing Radioactive Material in the Air Force*, updates office symbols, and additional unit responsibilities for unit representative.

1. References and Responsibilities.

1.1. Wing Commander (35 FW/CC) will appoint the Base Radiation Safety Officer (RSO).

1.2. The Medical Group Commander (35 MDG/CC) will:

1.2.1. Initiate, supervise, and execute the MAB Radiation Safety Program.

1.2.2. Have final approval authority for laser operations.

1.2.3. Implement and conduct a medical program designed to evaluate personnel Radio Frequency (RF) radiation hazards.

1.3. The Base RSO or alternate will:

1.3.1. Act as focal point to permit holders, radioactive material users, and commanders on the rules and regulations stated on all current permits.

1.3.2. Exercise authority to terminate operations when imminent danger exists.

1.3.3. Document education and training in accordance with ALARA and AFI 48-145*, Occupational Health Program.*

1.3.4. Provide the Fire Chief with a list of facilities containing radioactive commodities that are deemed potential hazards during fire fighting.

1.3.5. Develop procedures to assess permit compliance.

NOTE: If organizations are in non-compliance, the Base RSO has the responsibility to advise 35 FW/CC, PACAF Bioenvironmental Engineer (HQ PACAF/SGC), HQ Air Force Medical Support Agency Air Force Radioisotope Committee (HQ AFMSA/SGPR), and user senior management as appropriate. HQ AFMSA/SGPR or Nuclear Regulatory Commission (NRC) have the authority to revoke the permit.

1.3.6. Monitor the Base Radiation Dosimetry Program. Obtain signed statements from females on the Radiation Dosimetry Programs indicating that they understand their responsibility to notify their supervisor immediately if they become pregnant.

1.3.7. Monitor regulated areas and environmental radiation hazards.

1.3.8. Provide technical advice on emergency procedures (in the event of spills, explosions, or fire involving radioactive materials).

1.3.9. Review plans for proposed radiation usage.

1.3.10. Perform radiation protection surveys.

1.3.11. Recommend instrumentation related to radiation detection.

1.3.12. Provide technical advice on the receipt, shipment, transfer, and disposal of radioactive materials.

1.3.13. Monitor waste disposal control measures.

1.3.14. Maintain an inventory of all base activities using, storing, or handling radioactive material, x-ray emitters, and lasers. Maintaining an inventory of all RF emitters is also recommended.

1.3.15. Conduct an annual briefing to senior permit manager (named on the permit) and provide a summary of the briefing.

1.3.16. Conduct initial and annual worker training on hazards associated with ionizing radiation and document training on sign in sheet or other form.

1.4. Supervisors of units which have ionizing (radioactive materials, x-ray emitters, etc.) and non-ionizing radiation (RF emitters, lasers) sources will, when applicable:

1.4.1. Enforce the rules and regulations stated on all current permits for radioactive materials which list the permit and Base RSOs.

1.4.2. Be responsible for training/documenting and implementing the ALARA concept when dealing with ionizing and non-ionizing radiation.

1.4.3. Immediately notify the Base RSO or alternate Base RSO of any equipment, personnel, or procedural changes regarding ionizing or non-ionizing radiation.

1.4.4. Enforce all health and safety publications relative to the safe handling of all radioactive materials and machines producing ionizing and non-ionizing radiation.

1.4.5. Ensure all necessary safety equipment (such as shields, hoods, protective clothing, instruments, and long-handled tongs) is available and used by personnel working with radiation sources.

1.4.6. Conduct inspections necessary to ensure that all safety equipment is operative and in a good state of repair.

1.4.7. Indoctrinate new employees, within the first 8-hours prior to assignment to such duties, in the principles of radiation safety; to include proper wear and storage of all dosimeters. Immediately notify Public Health (35 AMDS/SGPM) and 35 AMDS/SGPB of assignment of women to work involving ionizing radiation.

1.4.8. Ensure all possible overexposures are reported to the Base RSO.

1.4.9. Be responsible for the safety of workers in any radiation environment, including pre-operative checks of safety equipment; for example, monitoring instruments, hood flow, eye shields, and interlocks.

1.4.10. Prepare a written Radiological Health and Safety Operating Instruction (OI) in coordination with the Base RSO, and send one copy to the Ground Safety Office (35 FW/SEG). Provide other copies as required. These instructions will also include emergency procedures.

1.4.11. Be alert for equipment failure or malfunction or improper safety procedures by personnel, which may result in excessive radiation exposure of personnel.

1.4.12. When applicable, maintain and comply with the radioactive material permit. Keep a record of the radioactive material within the area of supervision and send a copy to 35 AMDS/SGPB.

1.4.13. By written request to 35 AMDS/SGPM, ensure personnel are given pre-employment evaluations prior to assignment to duties involving laser radiation and request termination physicals when no longer working in radiation area.

1.4.14. Order, maintain, and operate radiation-measuring equipment necessary to ensure compliance with Air Force and federal standards.

1.4.15. Supervisors shall document initial and annual worker training on hazards associated with ionizing radiation on AF IMT 55, **Employee Safety and Health Record**.

1.4.16. Forward to the Fire Protection Branch (35 CES/CEF) a set of floor plans showing the locations of radiation areas and isotope storage areas.

1.5. While in radiation areas, each individual is responsible for proper storage and wearing of personnel monitoring devices and any protective equipment required by the RSO.

1.6. Responsible Medical Provider will:

1.6.1. Give pre-employment and termination physical examinations to all persons assigned to duties involving potential exposure to laser radiation as required by AFOSHSTD 48-139*, Laser Radiation Protection Program.*

1.6.2. Conduct special examinations and clinical tests as required.

1.7. Public Health Flight (35 AMDS/SGPM) will:

1.7.1. Facilitate necessary education of personnel occupationally exposed to radiation.

1.8. Civilian Personnel Office and Military Personnel Flight will effect temporary reassignment of civilian and military pregnant females occupationally exposed to ionizing radiation when reassignment is recommended by medical personnel.

1.9. Contractors will abide with AFI 40-201, Managing Radioactive Materials in the USAF, to include notifying the RSO before they bring new sources on base.

2. Personnel Dosimetry Program.

2.1. Requests for dosimeter service will be completed before assigning personnel to duties in ionizing radiation areas. The area supervisor will have the individual report to 35 AMDS/SGPB. When personnel are removed from duties within the radiation areas, the supervisor will submit a written request to 35 AMDS/SGPB discontinuing dosimeter service.

2.2. The wearing of dosimeters will be as follows:

2.2.1. Thermo Luminescent Dosimeters (TLD) issued by 35 MDOS/SGAOB will be worn by all workers entering a radiation area. Supervisors or designated personnel for each work section that requires the use of TLDs will take TLDs to Building 99 for periodic exchange or will arrange to have them collected by 35 AMDS/SGPB.

2.2.2. TLDs will be worn on the part of the body most likely to receive the greatest exposure to radiation.

2.2.3. Never place the badge inside the pocket or behind cloth, cigarettes, coins, or any obstruction whatsoever.

2.2.4. Supervisors must tell personnel that at no time will they tamper with TLDs. If these devices are accidentally damaged or exposed, the wearer must immediately return them to 35 AMDS/SGPB and exchange them for new ones. The wearer will explain the nature of the accident to aid in evaluation of the TLD.

2.2.5. Personnel working with industrial x-ray equipment or adjacent to high radiation areas will wear two self-reading pocket dosimeters or one digital alarm dosimeter (DAD) as prescribed by the RSO. This will permit frequent reading of the dosimeters during hazardous procedures. Pocket dosimeters should be worn clipped on the breast pocket of the outer garment. Never place dosimeters behind dense material such as coins or other metallic objects in the pocket.

2.2.6. When visitors enter a radiation area, they are required to register with the supervisor before entry. The supervisor will issue pocket dosimeters/DAD to the visitor and maintain AFTO Form 115, **Pocket Dosimeter Results Log**, with the visitor's name, address, date, time in and out, pocket dosimeter or DAD number, and the initial and final readings on the pocket dosimeter/DAD. The RSO will designate those areas and circumstances in which TLDs must be worn by visitors in addition to the pocket dosimeter/DAD.

3. Procurement Procedures.

3.1. All requests for radiation producing materials or equipment will be submitted to 35 AMDS/SGPB for review and approval.

3.1.1. The user will prepare a letter of justification and supporting documentation indicating the materials or equipment desired.

3.1.2. Requests to 35 AMDS/SGPB will include, as a minimum, the following information:

3.1.2.1. Name, title, organization, and telephone number of user.

3.1.2.2. Names, titles, and organizations of all personnel who will regularly use the material or equipment.

3.1.2.3. Exact locations where the material or equipment will be kept.

3.1.2.4. Brief outline or procedure to be followed and any other special requirements.

3.2. The application will not be approved if:

3.2.1. It is determined that the applicant is not equipped to observe the health and safety standards established by the NRC, HQ AFMSA/SGPR, 35 MDG/CC, or the criteria established within the NRC licenses applicable to the material or equipment involved.

3.2.2. It is determined that the applicant is not qualified to use radioisotopes or the equipment for the purpose requested.

3.2.3. Past records indicate that the applicant has neglected to observe necessary health and safety standards resulting in over exposure or injury.

3.3. The Base RSO may forward, to higher headquarters at the request of the applicant, applications that are controversial in nature and cannot be resolved at base level.

3.4. The Base RSO will submit the application, to HQ AFMSA/SGPR.

3.5. Base RSO and users will submit an application for permit amendments to 35 AMDS/SGPB. Radioisotopes may not be procured until the applicant has received written approval from the Base RSO.

4. Receipt.

4.1. All radioactive materials received on base will be handled in the following manner:

4.2. When any radioactive commodities are received, the receiving agency will contact base RSO for proper disposition of the material within 72 hours.

4.3. The wing RSO or his designated representative, will survey the package at the receiving agency and verify radiation levels at surface and one meter from container do not exceed levels in 49 CFR 173.422. If discrepancies are found, the wing RSO will have the shipment placed at the radioactive storage area and will notify the sender. The wing RSO will consult with a consultant health physicist at Det 3, Institute for Environmental, Safety, Occupational Health, and Risk Analysis, to determine proper follow-up action.

4.4. The receiving agency and the wing RSO will log all radioactive material arriving on MAB.

4.5. If the material is a permitted sealed source, the base RSO will be required to perform a leak test (swipe sample).

5. Storage.

5.1. Store all radioactive materials in safe and secure locations to prevent removal by unauthorized personnel. All machines producing ionizing radiation may be stored in convenient locations provided they are in a configuration to preclude inadvertent operation.

5.1.1. Shielding should be such that the exposure rate on the outside of the areas does not exceed 2mR/hr. The wing RSO must survey the area at least annually.

5.1.2. Post appropriate standard radiation-warning signs.

5.1.3. Make sure the area is uncluttered and in an orderly arrangement.

5.1.4. Post the names and telephone numbers of responsible individuals in a conspicuous location.

5.1.5. Maintain an inventory log of all radioactive commodities stored in the facility.

5.2. Radioactive material or items will be stored in accordance with T.O. 00-110N-3, *Requisition, Handling, Storage, and Identification of Radioactive Material.*

5.3. Authorized shipping containers for radioactive material may be used for storage provided the shielding is adequate (reference T.O. 00-110N-3).

5.4. Confine shipping and storage containers to the designated storage area, even when empty. The presence of contamination in amounts greater than the allowable limits (T.O. 00-110N-2, *Radioactive Waste Disposal*) will be reported to the base RSO.

6. Shipment.

6.1. Users of licensed/permitted radioactive materials must coordinate with the base RSO, or alternate base RSO, 35 AMDS/SGPB in Bldg 99 before any radioactive materials are shipped off MAB. Persons responsible for permitted radioactive material may not transfer such material to another person or organization except as provided in the applicable portions of the USAF radioactive material permit and in accordance with AFI 40-201.

6.1.1. Other transfers. An individual or organization must notify the base RSO before transferring radioactive materials or machines producing ionizing radiation that are not subject to regulation by a USAF radioactive material permit or the Nuclear Regulatory Commission.

7. Disposal/Recycle.

7.1. There should be no radioactive material (RAM) disposal at MAB. However, the supervisor will report any lost or misplaced RAM immediately to the base RSO or designated alternate. Under no circumstances will one using organization accept radioactive waste from another without written concurrence from the base RSO.

7.1.1. Using organizations will:

7.1.1.1. Dispose of radioactive waste in accordance with procedures outlined in T.O. 00-110N-2.

7.1.1.2. Attach radiation warning labels bearing the radiation symbol and the words, "RADIOACTIVE MATERIAL," to the container. The labels will be affixed so that at least one is visible from any direction of approach.

7.1.1.3. Be responsible for monitoring the containers for radiation intensity build up and taking swipe samples to determine if there is any removable contamination.

7.1.1.4. Forward waste information as listed in T.O. 00-110N-2 to the base RSO.

7.2. Excess Permitted/Licensed RAM. Excess RAM that is permitted or licensed will not be shipped for disposal or recycle unless approved by the base RSO. On-base owners and users of permitted RAM will contact the base RSO for approval to dispose or recycle their sources. Permitted or licensed RAM received from off-base sources will not be disposed or recycled unless approved by the base RSO.

7.3. The base RSO will arrange for disposal of RAM with the Institute of Risk Analysis Radiation Surveillance Division, Health Physics Branch, Air Force Radioactive and Mixed Waste Office or IERA/SDRH (AFRMWO), 2402 E. Drive, Brooks AFB, TX 78235-5114. The IERA/SDRH office will provide disposal instructions. Disposal will be arranged periodically, with attempts to remove items annually, if sufficient amount of RAM is awaiting disposal and funds are available.

7.4. For recyclable RAM, the base RSO will arrange with the Wright-Patterson AFB Radioactive Material Recycling Facility, 88 FW/EMB, 5490 Pearson Road, Wright-Patterson AFB, OH 45433-5332. Recycling RAM will be arranged periodically, depending upon the amount of material for recycling and available funds.

8. Surveys.

8.1. The Base 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 35 AMDS/SGPB by telephone and follow up with a written request.

8.2. Types of surveys are:

8.2.1. Probe surveys using portable survey meters to detect alpha, beta, gamma, neutrons, or x-rays.

8.2.2. Swipe sample surveys which use filter paper to smear suspected outer contaminated areas.

8.2.3. Evaluation of procedures, materials, and documentation.

9. Leak testing Sealed Sources.

9.1. Unless otherwise specified, the permittee is responsible for swipe sampling as specified; use filter paper as required to swipe the source. Forward by mail the leak test swab or filter paper in an enclosed envelope to the Det 1, HSC/OEBA, 2402 E Drive, Brooks AFB TX 78235 for analysis.

9.2. Each sealed source which the permittee uses will be tested for leakage and contamination at intervals of six months, unless otherwise specified in the permit.

9.3. If the above tests reveal the presence of 0.005 microcuries or more of removable contamination, the permittee will immediately notify Base RSO and withdraw the sealed source from use and arrange for it to be decontaminated and repaired or disposed of in accordance with the waste disposal procedures.

10. Emergency Procedures.

10.1. Emergencies include any unusual occurrences that result in contamination of facilities or environment, or that may result in the exposure of personnel to hazardous levels of ionizing or non-ionizing radiation. 35 AMDS/SGPB must be notified immediately of all these emergencies.

10.2. 35 AMDS/SGPB will be directly involved with all investigations and reporting of accidents and incidents involving radioactive materials. All reporting and investigations will be per the applicable sections of AFI 91-202*, The U.S. Air Force Mishap Prevention Program;* AFI 91-204*, Safety Investigations and Reports;* AFI 40-201; and TO 00-110N-3. Reporting under AFI 91-204 does not negate the reporting requirements of AFI 40-201 and the NRC.

10.3. Treat any radioactive material spill as a major spill until monitoring can be accomplished to determine the actual intensity of the radiation exposure.

10.4. Fire fighting procedures where known RAM is stored are as follows:

10.4.1. The fighting of fires, which may occur in buildings, must be accomplished in such a manner that exposure of personnel to radiation is held to a minimum and the spread of radioactive contamination is avoided.

10.4.2. As a general rule, when using fire hoses, water fog is preferable to solid stream application to avoid excessive runoff of water that may spread contamination.

10.4.3. If a fire breaks out, sound the evacuation alarm, call 911, and notify 35 AMDS/SGPB of its location. If no immediate radiation hazard exists and the potential for sustaining injuries is remote, combat the fire using the nearest fire extinguisher, sand, or water. If there is sufficient time, personnel who are using isotopes and are not in the fire area should quickly place their isotopes into storage containers, transport containers from the area, then close the windows and doors, and shut off the ventilation system before leaving the area.

10.4.4. Firefighters must wear protective clothing and respiratory equipment even though there is no evidence of immediate radiation danger. If possible, fire fighting should be conducted from the upwind side of the blaze.

11. Ingestion or Inhalation of Radioactive Material.

11.1. A person who ingests radioactive material should be transported immediately for medical treatment and 35 AMDS/SGPB notified of the incident.

11.2. A person who has inhaled radioactive material should be removed to an uncontaminated area immediately. The patient should be transported for medical treatment and 35 AMDS/SGPB notified of the incident.

12. Laser Safety Procedures.

12.1. Before starting any operation involving laser operations, adequate safe operating procedures will be developed. 35 AMDS/SGPB will inspect the operation area for hazards. All work with lasers will be done in accordance with AFOSHSTD 48-139. 35 AMDS/SGPB will have final approval authority for laser operations.

12.2. The using organization will when requesting approval of laser operations:

12.2.1. Prepare a safety OI for the laser and forward it to 35 AMDS/SGPB. The OI will contain the following information, as a minimum:

12.2.1.1. Personal hazards including safe eye exposure distance.

12.2.1.2. Location (building, room number; preferably a map).

12.2.1.3. Sequence of operations.

12.2.1.4. Individual (name) assigned as laser safety officer.

12.2.2. Send the following information to 35 AMDS/SGPB:

12.2.2.1. Location (building and room number).

12.2.2.2. Type of laser.

12.2.2.3. Wavelength.

12.2.2.4. Output power.

12.2.2.5. Mode of operation.

12.2.2.6. Pulse duration (if applicable).

12.2.2.7. Beam diameter in millimeters or centimeters.

12.2.2.8. Beam divergence in radians.

12.2.2.9. Transverse electromagnetic modes (if applicable).

12.2.2.10. Pulse repetition rate.

12.2.2.11. List of operational personnel giving the last, first, and middle name, rank or civil service rating, and Last 4 (SSN).

12.2.2.12. The maximum number of personnel required to participate in the operation.

12.3. Inspections of laser operations will be accomplished as follows:

12.3.1. The initial inspections are normally conducted by 35 AMDS/SGPB in conjunction with the unit safety officer and 35 FW/SEG representative.

12.3.1.1. The 35 AMDS/SGPB Chief or designated alternate is the inspection leader and will ensure laser safety, as prescribed in AFOSHSTD 48-139 and standards set by the Public Health Service, as required by Public Law 90-602, *Radiation Control for Health and Safety Act of 1968.*

12.3.1.2. 35 FW/SEG or designated alternate will inspect for compliance with applicable provisions of AFOSH 91-301, *Air Force Occupational and Environmental Safety, Fire Protection, and Health (AFOSH) Program*, and other applicable safety regulations that apply.

12.3.1.3. The unit safety representative will accompany the inspectors and make notes as to the deficiencies found. This individual has the responsibility for ensuring compliance with safe operating procedures.

12.4. MIL-STD-1425, Military Lasers and Associated Support Equipment, and the CFR Title 21, Food and Drug Administration, must be used in procuring nonexempt and exempt lasers respectively.

12.5. Exempt lasers must be disposed of in accordance with MIL-STD-1425.

12.6. Supervisors shall conduct initial and annual laser safety training and document training on AF IMT 55.

13. RF Safety Procedures.

13.1. 35 AMDS/SGPB should assess each RF emitter using AF IMT 2759*,* **Radio Frequency Radiation Emitter Survey**, will be completed at the time of the survey.

13.2. A copy of the completed AF IMT 2759 will be provided to Ground Safety Office (35 FW/SEG) for electro-explosives hazard evaluations. The surveyor will obtain the following information from the super-visor of an area in which RF emitters are used:

13.2.1. Location and nomenclature.

13.2.2. Organization responsible for its use.

13.2.3. Function of the RF emitter.

13.2.4. Operating frequency (or frequencies).

13.2.5. Antenna gain.

13.2.6. Output power (state if average or peak).

13.2.7. Operating mode (continuous wave or pulsed).

13.2.8. Pulse repetition frequency and pulse width.

13.3. Supervisors will coordinate all modifications and additions to RF emitters with 35 AMDS/SGPB. Supervisors are responsible for ensuring their workers are aware of and follow the safety procedures outlined in AFOSHSTD 48-9*, Radio Frequency Radiation Safety Program*. Supervisors will review and implement their responsibilities as explained in AFOSHSTD 48-9.

13.4. Supervisors shall conduct initial and annual radio frequency radiation safety training and document training on AF IMT 55.

14. Records.

14.1. Radioactive materials records will be maintained as follows:

14.1.1. The user and 35 AMDS/SGPB will maintain records on all Air Force permits and on all materials licenses, as required by the CFR Title 10 and AFI 37-138*, Records Disposition –Procedures and Responsibilitie*s.

14.1.2. The inventory records will list the isotope, activity, item description, date of original activity, model number, serial number and storage location.

14.2. For machines producing ionizing radiation:

14.2.1. The user and 35 AMDS/SGPB will maintain survey records on all machines producing ionizing radiation.

14.3. For machines producing non-ionizing radiation:

14.3.1. The users and 35 AMDS/SGPB will maintain survey records on all machines producing non-ionizing radiation that may be hazardous to personnel.

14.4. The personnel exposure records will be kept on AF IMT 1527, **History of Occupational Exposure to Ionizing Radiation** or equivalent.

WILLIAM J. REW, Brig Gen, USAF
Commander

Attachment 1

GLOSSARY OF REFERENCE AND SUPPORTING INFORMATION

References

AFPD 48-1, *Aerospace Medical Program*.

AFI 37-132, *Air Force Privacy Act Program*.

AFI 37-138, *Records Disposition—Procedures and Responsibilities*.

AFMAN 37-139, *Records Disposition Schedule*.

AFI 40-201, *Managing Radioactive Materials in the USAF*.

AFI 48-125, *U.S. Air Force Personnel Dosimetry Program*.

AFI 48-145, *Occupational Health Program*

AFI 91-202, *The U.S. Air Force Mishap Prevention Program*.

AFI 91-204, *Investigating and Reporting Mishaps*.

AFOSHSTD 48-9, *Radio Frequency Radiation (RFR) Safety Program*.

AFOSHSTD 48-139, *Laser Radiation Protection Program*.

AFOSHSTD 91-66, *General Industrial Operations*.

MIL-STD-1425, *Military Lasers and Associated Support Equipment*.

Public Law 90-602, *Radiation Control for Health and Safety Act of 1968*.

Code of Federal Regulations Titles 10, 21, and 49.

TO 00-110N-2, *Radioactive Waste Disposal*.

TO 00-110N-3, Requisition, Handling, Storage, and Identification of Radioactive Material.

AF IMT 55, **Employee Safety and Health Record**

Abbreviations and Acronyms

ALARA—As Low As Reasonable Achievable

DAD—Digital Alarm Dosimeter

MAB—Misawa Air Base

NRC—Nuclear Regulatory Commission

OI—Operating Instruction

RAM—Radioactive Material

RF—Radio Frequency

RSO—Radiation Safety Officer

TLD—Thermo Luminescent Dosimeter

Terms

AS LOW AS REASONABLE ACHIEVABLE CONCEPT— ALARA is defined as that set of management and administrative actions taken to reduce personnel ionizing radiation exposure to as low a level as possible consistent with existing technology, costs, and operational requirements.

CONTROLLED AREA— Any area in which radioisotopes are used or stored and access to which is controlled for the protection of individuals from exposure to radiation. In the case of non-ionizing radiation, controlled areas are those that may be occupied by personnel who accept potential exposure as concomitant of employment or duties; by individuals who knowingly enter areas where levels above the permissible exposure limits (PEL), defined in AFOSHSTD 48-9*, Radio Frequency Radiation (RFR) Safety Program,* are to be expected; and by personnel passing through such areas.

ELECTROMAGNETIC RADIATION— A term used to mean non-ionizing radiation in the frequency range from about 10 kilohertz (kHz) to 300 gigahertz (GHz).

MICROCURIES— One-millionth of a curie. A curie is a term that designates a quantity of radioactive material present. It is the amount of radioactive material that disintegrates at the rate of 37 billion atoms per second.

MILLIREM— One-thousandth of roentgen equivalent man (rem). A rem is a unit of absorbed radiation by man. Radiation standards are normally expressed in millirem (mrem) or rem per unit of time.

PROBE SURVEYS— Measurements using portable survey meter to detect alpha, beta, gamma, neutrons, or x-ray radiation.

RADIATION AREA— An area in which an individual could receive a radiation dose to a major portion of the body of 5 mrem or more in any one hour. Thermoluminescent badges and self-reading pocket dosimeters will be worn in radiation areas.

RADIATION DOSIMETER PROGRAM— A program described in AFI 48-125*, The U.S. Air Force Personnel Dosimetry Program,* for routinely monitoring personnel who work with radiation producing devices and who are likely to receive radiation doses in excess of one-tenth of the applicable radiation standard.

RESTRICTED AREA— An area having access limited to protect individual against undue risks from exposure to radiation or radioactive material.

SELF-READING POCKET DOSIMETER— A radiation detection device normally worn by an individual and designed to detect and quantitatively measure x-ray and gamma radiation. These dosimeters are not as accurate as TLDs, but they are read by the wearer and give a good indication of the radiation dose received by the wearer. They are to be worn while wearing TLDs.

SWIPE SAMPLES— Samples using filter paper to detect removable radioactive material. Filter paper is smeared across suspected contaminated areas.

THERMO LUMINESCENT DOSIMETER— A radiation detection device normally worn by an individual and designed to detect and quantitatively measure beta, gamma, x-ray, and, if required, neutron radiation. These dosimeters are read by the USAF Center for Radiation Dosimetry (formerly Armstrong Lab and Det 1, HSC/OEBD) at Brooks AFB, TX.