BY ORDER OF THE COMMANDER
452 AIR MOBILITY WING (AFRC)

MARCH ARB INSTRUCTION 48-201
30 June 1998

Aerospace Medicine

BASE RADIATION PROTECTION PROGRAM

COMPLIANCE WITH THIS INSTRUCTION IS MANDATORY

OPR: 452 SPTG/SGPB (Dana Eng) Pages:15
Certified by: 452 SPTG/SGPB (Patricia J. Oxendine) Distribution: F

This instruction implements AFPD 48-1, *Aerospace Medical Program*. It prescribes guidelines, responsibilities, procedures and precautionary measures for the control of ionizing and non-ionizing radiation sources and emitters. It establishes the Base Radiation Protection Program (RPP) and the As Low As Reasonably Achievable (ALARA) policy. The effectiveness of the program depends not only on the personnel responsible for organizing and implementing it, but the consistent and conscientious safety practices of the individuals in the work place. It establishes control on hazards associated with the use of radioactive materials and of devices capable of producing radiation. It must safeguard health and safety of military and civilian population while permitting maximum beneficial use of radiation. It implements the radiation control policies and requirements listed in paragraph 1. It applies to all units at March ARB that possesses or uses radioactive materials and radiation producing devices.

1. References:

1.1. AFI 40-2-1, *Managing Radioactive Material in the USAF*.

1.2. AFI 48-125, *USAF Personnel Dosimetry Program.*

1.3. AFM 161-38, *Diagnostic X-ray, Therapeutic X-ray, and Gamma-Beam Protection for energies up to 10 Million Electron Volts.*

1.4. AFOSH Standard 48-9, *Radio Frequency Radiation (RFR) Safety Program.*

1.5. AFOSH Standard 161-10, *Health Hazards Control for Laser Radiation.*

1.6. AFJMAN 24-204, *Transportation of Radioactive Material.*

1.7. TO 00-11ON-2, *Radioactive Waste Disposal.*

1.8. TO 00-11ON-3, *Requisition, Handling, Storage, and Identification of Radioactive Material.*

1.9. TO 33B-1-1, *Nondestructive Inspection Methods.*

1.10. Code of Federal Regulations, Title 10 (*Energy*) Title 21 (*Food and Drugs*), and Title 49 (*Transportation*).

1.11. AFOSH Standard 161-17, Standardized Occupational Health Program.

2. Terms Explained:

2.1. ALARA Concept. As low as reasonably achievable. The ALARA concept is a set of management and administrative actions to reduce personnel radiation dose to a level 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, i.e., no threshold dose-effect relationship exists.

2.2. Base Radiation Protection Officer (RPO). An individual designated in writing by the 452nd Air Mobility Wing Commander (452 AMW/CC) to manage the Base RPP. This individual will usually be the base Bo-environmental Engineer or Engineering Technician. The Base RPO conducts the base-wide RPP that includes surveillance of all radioactive materials and radiation-producing devices. This individual will coordinate with and assist the unit, permit, and medical facility RPOs to ensure a comprehensive program.

2.3. Ionizing Radiation. Electromagnetic radiation which may cause ionization of atoms and molecules within tissues of the body. Alpha and beta particles, gamma x-rays, and neutrons are examples of ionizing radiation.

2.4. Medical Facility RPO. An individual designated by the medical facility commander to manage the medical facility RPP. This individual will usually be a dentist who has the specialized training or experience in medical RPPs.

2.5. Nonionzing Radiation. Electromagnetic radiation at wavelengths and corresponding photon energies which are not high enough to ionize an absorbing molecule. Radio Frequency radiation in the Air Force is defined as electromagnetic energy emitted at frequencies between 10 kilohertz (KHz) and 300 gigahertz (GHz). Radar, lasers, and microwave ovens are examples of nonionizing radiation sources.

2.6. Permit RPO. An individual designated by the unit commander and approved by the USAF Radioisotope Committee (RIC) to manage the radiation protection aspects associated with the use of radioactive material for which a specific USAF Radioactive Material Permit has been issued.

2.7. Radiation. Emissions of electromagnetic energy into space in the form of particles or waves from radioactive materials or devices.

2.8. Radiation Protection Officer (RPO). The RPO is the individual designated by the commander to manage RPP. It is a functional title and is not intended to denote a commissioned status or a job classification within the Air Force Reserve. This individual should be the most technically qualified and experienced person available to assure capability commensurate with the assignment. There are four distinct categories of RPOs in the Air Force Reserve; i.e. base, unit, permit, and medical facility RPO. A single RPO may function in more than one RPO category.

2.9. Roentgen Equivalent to Man (REM). The dose of ionizing radiation. It is equal to the measured radiation exposure multiplied by the quality factor which is the relative effectiveness of a given kind of ionizing radiation in producing a biological response compared to 250 kiloelectron vols (keV)) x-rays.

2.10. Unit RPO. 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 a unit RPO.

3. Responsibilities:

3.1 The 452 AMW/CC in accordance with (IAW) AFOSHSTD 48-9, has the ultimate responsibility for the Base RPP and will:

3.1.1. Appoint a Base RPO to enforce the rules and regulations regarding radiation. This authority includes inspecting users of radioactive sources or ionizing and non-ionizing, radiation emitting equipment when unsafe conditions are indicated or suspected. The base RPO has the authority to terminate any activity that potentially compromises radiological health and safety.

3.1.2. Ensure all personnel comply with radiological health and safety precautions recommended by the Base RPO.

3.1.3. Ensure all base organizations comply with Air Force Reserve directives regarding licensing, procurement, storage, handling, accountability, and disposal of radioactive materials.

3.1.4. Ensure personnel and activities using radiation sources are routinely monitored.

3.2. The Director of Base Medical Services (DBMS) is responsible for the supervision and execution of the Base RPP through the Base RPO and will:

3.2.1. Set policy and requirements through the Base RPO for the control of radiation.

3.2.2. Oversee the conduct of medical examinations required by Air Force Reserve Regulations and AFOSH Standards regarding radiation exposures.

3.2.3. Assist Armstrong Laboratory, as necessary, to ensure patients receive required referral or follow-up examinations.

3.2.4. Ensure all reported incidents of suspected radiation overexposures are reported to and investigated by the Base RPO and that the results of such investigations are properly documented.

3.2.5. Appoint a medical facility RPO who will be responsible for the Dental Section.

3.3. Bo-environmental Engineering Services (BES) and the Base RPO are directly responsible to the DBMS for the administration and execution of the Base RPP and will:

3.3.1. Manage the Base RPP and maintain all necessary records.

3.3.2. Compile and maintain a current inventory of radiation sources.

3.3.3. Coordinate with and assist unit, permit, and medical facility RPOs to ensure effective management of this program.

3.3.4. Specify minimum requirements for the control of ionizing and non-ionizing radiation.

3.3.5. Review and approve all unit operating instructions (OIs) applicable to the use of radioactive materials or radiation-producing devices. This includes all plans that involve the acquisition, storage, use, or transfer of such items.

3.3.6. Coordinate all plans to install or relocate radiation-producing devices including any new construction where shielding is necessary.

3.3.7. Act as technical advisor to base officials and organizations in radiological health and safety matters.

3.3.8. Evaluate potential hazards from proposed or actual uses of radiation sources, including monitoring of personnel, work places, and the community environment.

3.3.9. Provide emergency support in the event of spills, explosions, fires, etc., involving radioactive materials.

3.3.10. Assist Public Health (PH) in the training of personnel regarding radiation protection procedures, health precautions, and ALARA concepts.

3.3.11. Monitor the receipt, shipment, and transfer or radioactive materials.

3.3.12. Coordinate the disposal of radioactive materials.

3.3.13. Manage the Personal Dosimetry Program, review and report dosimeter results annually to the Aerospace Medicine Council.

3.4. PH will:

3.4.1. Assist the unit RPOs in the annual radiological health training as described in 3.6.5. below.

3.4.2. Establish medical examination requirements for personnel exposed to potentially hazardous radiation sources. Obtain approval of the requirements from the Aerospace Medicine Council.

3.4.3. Monitor occupational health as described in paragraphs 3.4.2.

3.4.4. Assist the Base RPO during investigations of suspected personnel radiation overexposure incidents IAW AFI 48-125, AFOSH Standard 48-9, paragraph 1.8., and AFOSH Standard 161-10 paragraph 7. Use AF Form 190, Occupational Illness/Injury Report to document all incidents.

3.5. Unit Commanders owning or using radiation sources will:

3.5.1. Appoint a Unit RPO for their organization. Forward a copy of the appointment letter 452d SPTG/SGPB.

3.5.2. Appoint a permit or license RPO for their organizations, as necessary. Forward a copy of the appointment letter to 452 SPTG/SGPB. The permit or license RPO may also be the unit RPO.

3.6. Unit RPO will:

3.6.1. Ensure emphasis is given to the radiological health and safety of all unit personnel. Enforce all radiation protection regulations and make necessary safety equipment available.

3.6.2. Ensure OIs identify and limit personnel access to work areas containing potentially hazardous radiation levels. Prescribe procedures to follow in the event of a suspected overexposure. Send unit OIs to the Base RPO (452 SPTG/SGPB) for review and approval.

3.6.3. Act as the single point of contact for the unit on radiation safety, medical, or other consultant radiation survey activities.

3.6.4. Coordinate with the Base RPO before initiating any project involving procurement, use, and storage of radiation sources, or changes in working conditions, which would affect the radiation protection program to include:

3.6.4.1. Health risk from radiation exposure.

3.6.4.2. Health risks to unborn children of women who are occupationally exposed to ionizing radiation protection program to include:

3.6.4.3. Maximum permissible exposure limits.

3.6.4.4. ALARA philosophy and practice.

3.6.5. Refer all women who are occupationally exposed to ionizing radiation and who suspect that they are pregnant to the PH for an interview and consideration for a profile change. Supervisors must remove pregnant females from radiation duties until her private physician decides otherwise. A pregnancy profile will be generated. The Base RPO or BES representative will evaluate the individuals potential to exceed the O.S. REM for the duration of the pregnancy and make appropriate recommendations to her private physician.

3.6.6. Ensure ALARA training is performed annually for all radiation workers in their unit. Maintain ALARA training documentation and forward a copy to BES (452d SPTG/SGPB).

3.7. Permit RPO will:

3.7.1. Maintain a copy of the USAF Radioactive Material Permit and all correspondence through the unit and Base RPO.

3.7.2. Initiate amendments to the USAF Radioactive Material Permit by coordinating with the unit RPO, the using section, and the Base RPO.

3.7.3. Forward all permit-related correspondence through the unit and the Base RPO.

3.8. Medical/Dental Facility RPO will:

3.8.1. Address the medical/dental radiation protection requirements unique to the use of radiation for diagnosis and treatment of patients.

3.8.2. Conduct annual review of the Medical/Dental RRP as outlined in the USAF Radioactive Material Permit, if applicable.

3.8.3. Act as consultant to the Base RPO regarding Medical/Dental Section operations.

3.9. Supervisors of personnel who use radiation sources will:

3.9.1. Write OIs that delineate safety and health precautions for the operation and use of radiation sources as specified in hazard evaluations. The OIs will include procedures to follow in the event of an accidental overexposure.

3.9.2. Maintain an inventory of all radiation sources that show receipt, quantity on-hand, and items disposed. Notify the Base and unit RPO’s of any changes or modification to equipment, parameters, or facilities.

3.9.3. Maintain documentation and evaluation reports.

3.9.4. Comply with all operating, storage, disposal, and shipping guidance in this regulation.

3.9.5. Ensure workers under their supervision follow procedures for the protection of personnel from overexposure to radiation as published in technical orders, manuals, unit OIs, etc.

3.9.6. Ensure personnel do their work in a manner that keeps exposure to ALARA and in all cases below the permissible exposure limits.

3.9.7. Instruct workers regarding specific radiation hazards in their work place and the procedures to follow to avoid those hazards.

3.9.8. Report any suspected radiation overexposure immediately to the unit and Base RPO's, the unit commander, and the PH.

3.9.9. Ensure all personnel receive annual ALARA training (coordinate with the unit RPO).

3.10. Individuals who use radiation sources will:

3.10.1. Maintain all radiation exposures ALARA. Design all operations involving sources of ionizing and non-ionizing radiation to conform to principles of ALARA. Review and evaluate control provisions for potential radiation hazards to minimize exposures.

3.10.2. In the absence of specifically identified external radiation exposure control provisions, limit their time in radiation areas, maximize their distance from the sources (consistent with operational requirements), and use appropriate shielding.

3.10.3. Notify their supervisor immediately if, for any reason, they suspect that they may have been overexposed.

4. Ionizing Radiation Protection:

4.1. Exposure limits. The following exposure limits apply to medical and dental diagnostic or treatment exposures for patients.

4.1.1. For Restricted Areas:

4.1.1.1. Whole Body Exposures. The accumulated total effective dose equivalent to the whole body will not exceed 1250 millirems per quarter or 5 millirems per calendar year.

4.1.1.2. Individual Organ Exposure. The accumulated total organ dose to any organ will not exceed 12.5 REMS per quarter or 50 REMS per calendar year.

4.1.1.3. Skin and Extremity Exposures. The accumulated dose to the skin and extremities will not exceed 12.5 REMS per quarter or 50 REMS per calendar year.

4.1.1.4. Exposure to minors. Personnel under the age of 18 may not be intentionally exposed to any ionizing radiation except for medical or dental diagnostic or treatment purposes. The accumulated exposure to a minor will not exceed 500 millirems in any calendar year.

4.1.1.5. Exposure to Pregnant Females. Do not expose pregnant workers to radiation levels that would result in a dose greater than 500 millirems for the total duration of the pregnancy.

4.1.1.6. Exposure to the General Public. The general public will not be exposed to an accumulated total effective dose equivalent of 100 millirems in a calendar year.

4.1.2. For Unrestricted Areas. Do not exceed an external dose exposure of 2 millirems in an hour.

4.2. Monitoring Requirements:

4.2.1. BES is responsible for conducting radiation-monitoring surveys IAW AFI 48-125.

4.2.2. BES will issue Thermoluminescent Dosimeter (TLD) badges to all personnel assigned to duties in work places using radioactive materials or ionizing radiation-producing devices, who are likely to receive an accumulated radiation dose in excess of 10 percent of the occupational limits above. Use TLDs to monitor routine occupational exposure.

4.2.3. Conduct TLD monitoring to record the radiation dose received by each designated worker to ensure that exposures will not exceed ALARA limits outline in attachment 1.

4.2.3.1. The supervisors will request TLD badges from BES. The supervisor is responsible for obtaining dosimetric devices other than TLDs (nondestructive inspection personnel, for example).

4.2.3.2. Each individual will report to BES to receive a pre-entry interview and instructions on the wear and care of the TLD. They will read and sign a Personal Dosimetry information letter that is to be filed in his or her medical records. Inform females of potential radiation hazards to a developing fetus, as will as procedures to follow if they suspect that they are pregnant.

4.2.3.3. Individuals will not tamper with the TLD or other dosimetric devices. Should a TLD be accidentally damaged or exposed, return it to BES immediately. The TLD user must explain the nature of the accident to aid in the evaluation of the dose received.

4.2.3.4. TLDs will be worn only while performing duty exposing the individual to radiation. When not being worn, store TLDs with the control TLD in a designated storage location not exposed to radiation. TLDs must never be worn during medical or dental exposures for diagnostic procedures.

4.2.3.5. The different section TLD area monitors will collect TLDs monthly or quarterly and provide them to BES for processing to determine the amount of exposure recorded. Armstrong Laboratory, Brooks AFB, Texas, will submit a report (AL Listing 1499, **Report of Occupational Exposure to Ionizing Radiation**) to BES documenting individual radiation exposures. A copy of AL Listing 1499 will be sent to the supervisors of the respective radiation work places to assist them in tracking exposures and ensure compliance with the ALARA concept. Supervisors should have the individual's initials next to their name, on the listing, to document exposure notification, and maintain the listing on file. Maintain an AF Form 1527, **History of Occupational Exposure to Ionizing Radiation**, in the individual's medical record to document lifetime exposure history.

4.3. Safety and Health Precautions:

4.3.1. The unit RPO will post and control radiation areas as defined in 4.4. below.

4.3.2. Unit radiation safety programs must conform to the minimum standards described herein, plus any additional restrictions imposed by the Base RPO.

4.3.3. All supervisors involved in operations where ionizing radiation is present will immediately notify the unit and Base RPOs if any of the following incidents occur:

4.3.3.1. Damage to, or malfunctions of, equipment and devices which have resulted in radiation leakage.

4.3.3.2. An excessive pocket dosimeter reading (above the ALARA levels), damage to, or loss of, a personal TLD badge or possible accidental exposure of TLD badge.

4.3.3.3. Loss, spill, theft, or unintentional release of radioactive material.

4.3.3.4. Any emergency situation in an area where radioactive material is stored or used.

4.3.3.5. Excessive readings on radiation detection equipment.

4.3.3.6. Possible exposure to a nonradiation worker or any suspected overexposure to any person.

4.3.4. Supervisors will ensure that individuals working in a radiological controlled area do their assigned tasks IAW approved operating procedures and applicable rules, regulations, and health requirements.

4.4. Classification of Radiation Areas. The Base RPO will designate all radiation areas. The unit RPO will post appropriate warning signs.

4.4.1. Restricted Area. Any area in which a continuously exposed person could receive a dose in excess of 2 millirems in one hour, 100 millirems in any 7 consecutive days, or 500 millirems per year.

4.4.2. Radiation Area. Any area in which a continuously exposed person could receive a dose in excess of 5 millirems in one hour at a distance of 30 centimeters from the radiation source.

4.4.3. High Radiation Area. Any Area in which a continuously exposed person could receive a dose in excess of 100 millirems in one hour at a distance of 30 centimeters from the radiation source.

4.4.4. Very High Radiation Area. Any area in which a continuously exposed person could receive a dose in excess of 500 rads in one hour at a distance of 1 meter from the radiation source.

4.5. Storage of Radioactive Materials:

4.5.1. Unrestricted Storage Areas. Sealed sources may be stored in unrestricted areas provided that the radiation intensity at 1 meter from any single container in storage does not exceed 2 mR/hr. Tag individual containers and store with appropriate radiation warning signs that are plainly visible at all times. Place markings on isotope containers in storage in such a position so that there will be no radiological hazard to any person while reading them.

4.2.5. Restricted Storage Areas. Radioactive materials or times exhibiting radiation intensities in excess of 2 mR/hr from any single container in storage must be stored in a restricted area to prevent entry of unauthorized personnel. The radiation intensity at no point of the exterior perimeter of the restricted area will exceed 2 mR/ht. Post the storage area with signs IAW TO OO-11ON-3. This includes the room and the storage containers.

4.5.3. BES will monitor all Restricted Storage Areas quarterly and Unrestricted Storage Areas annually.

4.6. Waste disposal:

4.6.1. Contact the Base ROP and the Base environmental Coordinator (452 CES/CEV) before disposing of any radioactive material.

4.6.2. The unit owning or using radioactive material is responsible for conforming to all requirements pertaining to safe disposal IAW Title 10 of the Code of Federal Regulations and TO OO-11ON-2.

4.6.3. Supervisors will furnish information regarding the half-life of the isotope, estimated activity, date of estimation, radiation level at the surface of the containers, and instrument used in determining the surface radiation level.

4.6.4. Separate short-life radioactive material from long-life radioactive material.

4.6.5. Supervisors will maintain the records of disposal of radioactive wastes.

4.6.6. Request waste containers for shipment from Base Supply Officer. Use waste containers and attach warning labels to these containers as described and in accordance with AFJAMN 24-204.

4.6.7. Keep the container covered and monitor periodically to determine the intensity build-up. Radiation levels will not exceed 200 millirems per hour on the surface and the transport index is not over 10 at 3 feet from the container.

4.6.8. The using activity can dispose of unserviceable radioactive electron tubes and spark gaps as normal waste; however, they must be accumulated prior to disposal.

4.7. Record Keeping:

4.7.1. BES will maintain records including:

4.7.1.1. Source inventories.

4.7.1.2. Personnel Dosimetry.

4.7.1.3. Area Monitoring and Surveys.

4.7.2 Individual users or supervisors will retain copies of any records in these categories. Users will retain copies of radioactive material permits.

5. Nonionizing Radiation Protection:

5.1. Radiofrequency Radiation.

5.1.1. Exposure Limits. This is the intensity of radio frequency radiation that is not expected to cause detectable bodily injury. Exposures separated by more than six minutes are essentially separate physiological events with non-cumulative effects. The permissible exposure limits (PEL) listed below are based on limiting the total body absorbed power to a specific absorption rate of 0.4 Watts per kilogram of body weight averaged over any six minute period per AFOSH Standard 48-9 attachment 2.

5.1.2. Monitoring Requirements:

5.1.2.1. BES is responsible for performing radiological hazard surveys IAW AFOSH Standard 48-9.

5.1.2.2. Microwave Ovens. Microwave ovens used for food preparation on Air Force installations do not require routine surveys regardless of the oven. Ovens that are used on Air Force bases may be surveyed if the device is suspected of leaking. Suspected leakage should be reported to PH and removed from service until testing can be performed. PH will contact BES to conduct the field test.

5.1.2.3. Safety and Health guidelines. Routine, pre- or post-employment physical examinations on personnel occupationally exposed to radio frequency radiation are not normally required. Investigate suspected or confirmed overexposure IAW AFOSH Standard 48.9.

5.2. Laser Radiation:

5.2.1. Exposure Limits. No personnel will be exposed to laser radiation in excess of the maximum permissible exposure (MPE) limits specified in AFOSH Standard 161-10, Appendix III. The MPE is the radiant exposure which personnel may receive without adverse biological effects.

5.2.2. Monitoring Requirements.

5.2.2.1. BES is responsible for performing surveys at all facilities where lasers are operated. BES must review and approve construction plans for new laser facilities, or alterations to existing facilities, before laser operations begin. Coordinate laser relocation within an approved facility through the unit RPO to the Base RPO, who will determine if a re-survey is required.

5.2.2.2. Coordinate all lasers procured at March ARB through BES to which the following information will be furnished.

5.2.2.2.1. Wavelength in microns.

5.2.2.2.2. Beam diameter at the aperture.

5.2.2.2.3. Beam divergence, full angle in milliradians.

5.2.2.2.4. If continuous wave, maximum and average power in Watts.

5.2.2.2.5. If pulse wave, pulse repetition rate, plus length in seconds, and peak and average power (energy) per pulse in Watts.

5.2.2.2.6. Location where laser will be used.

5.2.2.2.7. Schedule of usage and by whom.

5.2.3. Safety and Health Precautions:

5.2.3.1. Each laser operation should have a written procedure for setting up and operating the laser that is formalized and posted conspicuously in the work place. As a minimum, the written procedure is reviewed by the unit RPO for adherence to the ALARA concept and approved by the Base RPO.

5.2.3.2. The Base RPO will advise laser users of the minimum required optical density protective goggles. All protective eye wear should have the stated optical density and applicable wavelength printed on them.

5.2.3.3. Unit RPO’s will ensure that all entrances to laser facilities are posted with the appropriate laser warning placards IAW AFOSH Standard 161-10, Appendix IV.

5.2.3.4. All laser facilities must have environmental controls sufficient to maintain safe, healthful working conditions. Laser should be equipped with electrical interlock devices to prevent accidental laser firing.

5.2.3.5. Refer all new personnel with no previous laser duties to PH to receive an eye examination as specified in AFOSH Standard 161-10, paragraph C8d. New personnel with previous laser duties will be given an eye examination prior to assignment to duties if one was not done within the past year. All personnel departing PCS or terminating laser duties will receive an eye examination.

5.2.4. BES will compile a laser inventory and maintain a record of all surveys on lasers used.

CLAYTON T. GADD, Brig Gen, USAFR
Commander

Attachment 1

PROGRAM OF MAINTAINING OCCUPATIONAL RADIATION EXPOSURES ALARA

A1. Management Commitment:

A1.1. The 452 AMW is committed to keeping occupational exposures to all forms of radiation ALARA. To formalize this commitment, the administrative organizations for radiation protection and development of necessary written policy, procedures, and instructions to foster the ALARA concept at MARCH ARB are: Aerospace Medicine Council, unit RPO, and a Base RPO.

A1.2. In addition to maintaining exposures to individuals as far below the limits as reasonably achievable, the sum of the exposures received by all exposed individuals will also be maintained at the lowest reasonable level.

A1.2. Aerospace Medicine Council Will:

A1.2.1. Provide medical expertise pertaining to occupational physical examinations for personnel exposed to radiation in any form.

A1.2.2. Recommend follow-up examinations or other appropriate actions for abnormal exposures and suspected or confirmed overexposures.

A1.2.3. Review and approve the Base RPO reports on ALARA practices and document them in the Aerospace Medicine Council's minutes.

A1.2.4. Evaluate March ARB overall efforts for maintaining exposures ALARA on an annual basis.

A1.3. Reviews of the ALARA Program:

A1.3.1. The Base RPO, with the assistance of the unit s RPO's will annually review the radiation protection program for adherence to ALARA concepts. Brief this review to the Aerospace Medicine Council. The Base RPO has the primary responsibility to initiate changes in the RPP to ensure all exposures are ALARA. Conduct reviews of specific procedures on a more frequent basis.

A1.3.3. The Base RPO will review annually the exposure histories (AF Form 1527) of all personnel on the personal dosimetry program to ensure data is current. Report discrepancies to the Aerospace Medicine Council.

A1.3.3. The base RPO will perform monthly reviews of the exposures of all personnel on the personal dosimetry program (AL Form 1499). Report the quarterly and annual summary reviews to the Aerospace Medicine Council.

A1.3.4. The PH will review annually the medical records of personnel on the personal dosimetry program to ensure physical examinations are correct. Report unusual test results and discrepancies to the Aerospace Medicine Council.

A1.4. Training Responsibilities for ALARA Program:

A1.4.1. The PH, with the assistance from the Base RPO, will schedule briefings and training sessions to inform workers of radiological health hazards and the ALARA concept.

A1.4.2. Unit RPOs will ensure that all personnel occupationally exposed to radiation in any form receive annual training. The unit RPOs should encourage suggestions of workers to improve radiological practices and develop ALARA procedures.

A1.4.3. Each worker will be informed of reporting procedures regarding discrepancies from the ALARA concept.

A1.5. Establishment of Investigative Procedures:

A1.5.5. Investigation levels for external occupational exposures to ionizing radiation are established which, when exceeded, will initiate a review or investigation by the Base RPO. These are:

A1.5.6. The Base RPO will review and annotate accordingly the AL Form 1499, which indicate the results of personal monitoring at least monthly. Take the following actions based on the investigative levels stated below:

A1.5.6.1. Exposure Less Than 50 mrems/mo or 150 mrems/quarter. No further action will be taken except when deemed appropriate by the Base RPO or Aerospace Medicine Council.

A1.5.6.2. Exposure Equal to or Greater Than 50 mrems/mo or 150 mrems/quarter. The Base RPO, with the assistance of the unit RPO, will investigate the reason for the exposure. Contact the individual to provide information on tasks performed, unusual procedures, etc. The individual's exposure history for the last three monitoring periods will also be reviewed to determine if a trend exists which would indicate poor ALARA practices. Report results of the investigation to the Aerospace Medicine Council. Unless deemed appropriate by the Aerospace Medicine Council, no further action relative to the exposure will be taken.

A1.5.6.3. Exposure Equal to or Greater Than 417mrems/ mo or 1250 mrems/quarter. The Base and unit RPOs will conduct a formal investigation initiated by AL Radiation Dosimetry Branch. (RDB) IAW AFI 48-125. Interview the individual to determine the tasks being performed when the exposure occurred, if proper dosimeter wear and operating procedures were used. Examine the individual's exposure history to determine if accumulated dosages have exceeded those set in consultation with EHS and the Chief of Aerospace Medicine, the individual may require a physical examination. Report the results of the investigation to the Aerospace Medicine Council, which may recommend follow-up examination or other appropriate actions.

A1.5.7. Should a pregnant female be exposed occupationally or accidentally to ionizing radiation from any source, including medical or dental, the Base RPO will investigate to determine the dosage delivered to the fetus. Use the checklist maintained by BES to relay information to AL/RDB, Brooks AFB TX 78235-5501 for evaluation. Brief the Aerospace Medicine Council on results of the investigation and of the recommendations for follow-up actions from AL/RDB.