BY ORDER OF THE COMMANDER
JOINT BASE LANGLEY-EUSTIS

JOINT BASE LANGLEY-EUSTIS
INSTRUCTION 48-104

29 NOVEMBER 2016

AEROSPACE MEDICINE

RADIATION SAFETY PROGRAM

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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RELEASABILITY: There are no releasability restrictions on this publication.

OPR: 633 AMDS/SGPB

Certified by: 633 MDG/CC
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Supersedes: JBLE 48-104, 25 Aug 2011

Pages: 30

This instruction provides guidance, procedures, precautionary measures, and responsibilities for the control of radioactive materials (RAM) and radiation-producing devices. This instruction incorporates AFI 40-201, *Radioactive Materials (RAM) Management*; AFI 48-148, *Ionizing Radiation Protection*; AF48-109, *Electromagnetic Field Radiation (EMFR) Occupational and Environmental Health Program*; AFI 48-139, *Laser and Optical Radiation Protection Program*; and AFMAN 48-125, *Personnel Ionizing Radiation Dosimetry*. It applies to all activities on Joint Base Langley-Eustis (JBLE) Langley to include its tenant units as well as contractors who possess, use, handle or store sources of radiation within JBLE. This instruction is not applicable to JBLE-Eustis. Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using the AF Form 847, *Recommendation for Change of Publication*; route AF Forms 847 through appropriate chain of command. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with Air Force Manual (AFMAN) 33-363, *Management of Records*, and disposed of in accordance with Air Force Records Information Management System (AFRIMS) Records Disposition Schedule (RDS).

SUMMARY OF CHANGES

This document is substantially revised and must be completely reviewed. This revision implements and reflects changes made to incorporates AFI 40-201, *Radioactive Materials (RAM) Management*; AFI 48-148, *Ionizing Radiation Protection*; AFI 48-109, *Electromagnetic Field Radiation (EMFR) Occupational and Environmental Health Program*; AFI 48-139, *Laser and Optical Radiation Protection Program*; AFMAN 48-125, *Personnel Ionizing Radiation Dosimetry*; and Surgeon General (SG) Notice to Airmen (NOTAM) 14-002, *Improper Transfer of Generally Licensed Devices containing Radioactive Material*. This instruction supersedes JBLEI 48-104 dated 25 August 2011.

Chapter 1

OBJECTIVE

1.1. This instruction describes the Radiation Safety and "As Low as Reasonably Achievable" (ALARA) Program for JBLE-Langley. It requires control of radioactive materials (RAM) and instruments or radiation-producing devices to safeguard the health of military and civilian populations, while permitting maximum benefits from their use. The effectiveness of these programs depends on consistent and conscientious safety efforts of the material/device users.

Chapter 2

ROLES AND RESPONSIBILITIES

2.1. The Commander, 633d Air Base Wing (ABW) shall

2.1.1. Ensure all installation activities comply with AFIs 40-201, 48-139, 48-148, AFMAN 48-125, AFI 48-109 and all other applicable AF directives covering the usage of radiation-producing devices to include the permitting, procurement, storage, handling, and accountability for and disposal of radioactive material and the reporting of incidents or accidents to the appropriate authorities.

2.1.2. Conduct an installation-wide radiation safety program through the 633d Aerospace Medicine Squadron (AMDS) Bioenvironmental Engineering (BE) Flight (633 AMDS/SGPB) under the direction of JBLE Installation Radiation Safety Officer (IRSO) and Installation Laser Safety Officers (ILSOs), both hereinafter known as IRSO.

2.1.3. Designate the IRSO in writing and may designate an Alternate IRSO, which may act with full authority of the designated IRSO in his/her absence.

2.2. The Commander, 633d Medical Group (MDG) shall

2.2.1. Provide the IRSO, Aerospace Medicine Flight, BE Flight, Public Health (PH) Flight and Optometry Clinics the resources necessary to carry out provisions in this instruction.

2.2.2. Through the IRSO, advise tenant unit commanders on radiological health and safety.

2.3. All Unit Commanders shall

2.3.1. Ensure unit personnel who receive, possess, distribute, use, transfer, or dispose of RAM observe the requirements of this instruction, federal, local, and USAF policies and regulations.

2.3.2. Appoint, in writing, a Unit Radiation Safety Officer (URSO) if their unit or workplace uses and/or possesses radioactive material or radiation-producing devices. Send copy of appointment letter to 633 AMDS/SGPB.

2.3.3. Appoint RAM Permit Radiation Safety Officer (PRSO), as required by AFI 40-201 and AFI 48-148. The PRSO must be a member of the using organization and meet education and experience requirements in AFI 40-201.

2.3.4. Appoint Unit Laser Safety Officers (ULSO) for units using or possessing American National Standards Institute (ANSI) Class 3B or 4 lasers.

2.3.5. URSOs, PRSOs and ULSOs will be the IRSO's single point of contact for their respective materials, devices and instruments.

2.3.6. Establish a unit EMF safety awareness training program.

2.3.7. Ensure workplace supervisors responsible for the operation of potentially hazardous EMF emitters develop a unit radiation safety awareness training plan to aid in the implementation of the unit training program.

2.3.8. Establish procedures for workers to report suspected EMF overexposures to the responsible supervisor and to BE. Support BE investigative efforts and reconstruction of

exposure incidents. Ensure these procedures are incorporated into the unit safety awareness training plan.

2.4. The IRSO shall

2.4.1. Initiate, supervise, and execute the JBLE-Langley Radiation Safety Program IAW AFIs 40-201, 48-139, 48-148, AFMAN 48-125 and AFI 48-109.

2.4.2. Act as central point of contact for all requests to use RAM or radiation-producing devices, including those by contractors.

2.4.3. Provide the following in support of the Installation Radiation Protection Program.

2.4.3.1. Manage the Thermoluminescent Dosimetry (TLD) Program IAW AFMAN 48-125 (when applicable).

2.4.3.2. Coordinate requests for radioactive waste disposal and recycling through Wright-Patterson AFB Installation Management Division's Air Force Radioactive Recycling and Disposal Office (88 ABW/CEIEC).

2.4.3.3. Coordinate with all units that typically have generally licensed devices (GLDs) and inform them of the requirements of the SG NOTAM 14-002.

2.4.4. Investigate the loss, theft or spill of RAM, and all real or suspected overexposures to radiation IAW AFIs 40-201, 48-139, 48-148, AFMAN 48-125, and AFI 48-109.

2.4.4.1. In the event of contractor loss or release of RAM and/or suspected overexposures to ionizing radiation from RAM, the IRSO will report to the USAF Radioisotope Committee (RIC) those portions of the incident that pertain to the AF involvement.

2.4.4.2. The IRSO may recommend procedures to contractors through the contracting officer.

2.4.5. Be the sole authority for contacting the Air Combat Command's BE (ACC/SGPB), USAF RIC or the Nuclear Regulatory Commission (NRC) regarding reportable events.

2.4.6. The IRSO may be appointed temporarily (not to exceed 90 days) as PRSO only when the using organization has no other qualified personnel.

2.4.7. Develop and manage an installation laser and optical radiation safety program.

2.4.8. Assist the installation commander in developing and maintaining policies, procedures and instructions to meet AFI 48-139.

2.4.9. Incorporate laser and optical radiation hazard evaluations into the special surveillance processes described in AFI 48-145.

2.4.10. Establish a formal Laser Safety Committee, as needed, when there are three or more units using Class 3B and/or Class 4 Food and Drug Administration (FDA) compliant lasers or military-specific lasers.

2.4.11. Coordinate suspected laser accidents/incidents as detailed in AFI 48-139.

2.4.12. Ensure that the outdoor use of lasers adheres to federal, military, state, and local regulations.

2.4.13. Ensure that each unit employing military-specific lasers maintains a copy of the Air Force Laser Systems Safety Review Board (LSSRB) approval letter and hazard evaluation or safety summary for each system type.

2.4.14. Verify the ULSO training is IAW AFI 48-139.

2.4.15. Suspend installation operations involving the operation of laser or other optical radiation sources that pose a significant health risk to personnel, are in clear violation of regulations or requirements, or can negatively impact AF operations, materiel or real estate.

2.4.16. Maintain a listing of hazardous laser and optical radiation equipment. Depending on the equipment, the list could include nomenclature, classification, wavelength, unit of assignment (Class 3B and 4 lasers), or other hazard descriptors.

2.4.17. Accomplish and document completion of required training IAW AFI 48-139.

2.4.18. Consult with the Environmental, Safety and Occupational Health (ESOH) Service Center, as needed, on issues such as hazard evaluations, controls, investigations, and/or FDA exemptions.

2.5. The URSO, PRSO and ULSO shall

2.5.1. Maintain and update an inventory of all RAMs, lasers, GLDs, and radiation-producing devices, respectively, within the organization. The URSO, PRSO and/or ULSO must contact the IRSO when any changes occur.

2.5.2. The URSO will ensure workplaces using GLDs adhere to the provisions of 10 CFR 31.5, certain detecting, measuring, gauging, or controlling devices and certain devices for producing light or an ionized atmosphere and register the devices with the USAF RIC.

2.5.3. Coordinate with the IRSO for assistance in developing unit radiation-safety training and operating instructions (OIs).

2.5.4. Establish a written unit-training program IAW AFIs 40-201, 48-139 (lasers), 48-148 (RAM and ionizing radiation-producing devices), AFMAN 48-125 (TLDs) and AFI 48-109 (EMF Radiation).

2.5.4.1. The goal of the radiation-safety awareness training is to ensure exposures are kept ALARA. Document training on each member's AF Form 55, Employee Safety and Health Record, or equivalent.

2.5.4.2. Contact BE if you need assistance in conducting radiation-safety awareness training.

2.5.5. Understand and enforce the requirements in Attachment 3 of this instruction pertaining to contractors bringing RAM onto JBLE-Langley.

2.5.6. Develop and manage a unit laser and optical radiation safety program.

2.5.7. Develop and maintain unit policies, procedures and instructions to meet AFI 48-139.

2.5.8. Assist the unit commander in developing policies, procedures and/or instructions to meet AFI 48-139.

2.5.9. Coordinate suspected laser accidents/incidents as detailed in AFI 48-139.

2.5.10. Act as a POC for the unit on laser and other optical radiation safety matters and maintain lines of communication with the IRSO, Ground Safety (SEG) and PH personnel.

2.5.11. Ensure supervisors and workers are aware of and follow laser and other optical radiation-safety procedures described in AFI 48-139, Concepts of Operations/Employment (CONOPS/CONEMPS), Tactics, Techniques, and Procedures (TTPs), Standard Operating Procedures (SOPs), Technical Orders (TOs), manuals, unit instructions and other applicable guidance documents.

2.5.12. Coordinate laser and other optical radiation-evaluation activities with unit command, supervisory personnel and the IRSO.

2.5.13. Suspend unit operations involving the operation of laser or any optical radiation-sources that pose a significant health risk to personnel, are in clear violation of regulations or requirements, or can negatively impact AF operations, materiel or real estate. Coordinates with the IRSO as needed to maintain safe operation.

2.5.14. Ensure the outdoor use of unit lasers adheres to federal, military, state, and local regulations.

2.5.15. Maintain a copy of the AF LSSRB-approval letter and hazard evaluation for each type of military-specific laser acquired by the unit (if applicable).

2.5.16. Maintain accountability for all Class 3B and 4 lasers and laser systems and all military-specific lasers, regardless of class, possessed by the unit.

2.5.17. Ensure that no military-specific laser is released outside of the AF unless it is transferred to another Department of Defense (DoD) Service that has approved the use of the system, has been brought into full compliance with 21 CFR 1040.10 & 1040.11, and has the compliance paperwork filed with the FDA or destroyed IAW with DODI 4160.21-M.

2.6. 633 AMDS, Bioenvironmental Engineering Flight shall

2.6.1. Maintain a proficient level of knowledge, training and experience in assessing EMF hazards in the workplace, performing required measurements and responding to health issues raised by workers, installation residents and the general public.

2.6.2. Conduct EMF health-hazard evaluations for new systems, operations and modified systems in use on the installation and maintain documentation of the evaluation in the Defense Occupational and Environmental Health Readiness System (DOEHRS). Provide guidance and recommendations regarding engineering controls, personal protective equipment and warning devices, posting requirements, and other administrative controls as necessary.

2.6.3. Assist unit commanders and workplace supervisors in the development of EMF safety awareness training programs, particularly in the area of bio effects, exposure incident reporting, and identification and control of hazardous areas in the workplace.

2.6.4. Verify that EMF sensors, detectors, alarms, area monitors, and personal warning devices, were approved by Air Force Medical Support Agency BE (AFMSA/SG3PB).

2.6.5. During home station and deployed operations, provide guidance to local commanders regarding the potential for personnel injuries from EMF emissions.

2.6.6. Investigate all alleged or suspected overexposures. Complete the final report of the investigation for submission as described in AFI 48-109.

2.6.7. Notify and coordinate with USAF School of Aerospace Medicine, AFMSA/SG3PB, and the ACC/SGPB on all EMF overexposure investigations, and provide copies of final documentation for evaluation and possible inclusion in the Electro-Magnetic Field Radiation Exposure Registry (EMFRER). Coordinate with Weapons Safety (SEW) on EMF weapon incident investigations.

2.6.8. Document EMF hazard evaluations to include: the applicable Maximum Permissible Exposure (MPE) for each emitter; hazard distance calculation(s) to estimate the hazard distance; accessibility, locations, and conditions that present potential hazards; measurements to identify actual hazard locations and to define controls for these hazards.

2.6.9. Conduct on-site measurement surveys in all cases where there was any doubt about where personnel hazards (power densities at or above the MPE) might exist.

2.6.10. Determine the weighted contributions from simultaneously operated emitters where multiple EMF emitters are collocated in fixed arrangements (if needed).

2.7. 633 AMDS, Aerospace and Operational Medicine Flight shall

2.7.1. Conduct reemployment and termination medical examinations of civil service employees and Air Force personnel who may be routinely exposed to ionizing radiation.

2.7.2. Ensure that examinations and care are provided immediately for all suspected overexposures involving lasers or other optical radiation sources.

2.7.3. Document all examinations in individual medical records.

2.7.4. Ensure that aircrew only use laser eye protection certified Safe-to-Fly by the applicable MAJCOM, AFRC, ANG, or equivalent.

2.7.5. Assist the IRSO with investigations of all suspected overexposures involving lasers or other optical radiation sources.

2.8. 633 AMDS, Public Health Flight shall

2.8.1. Assist IRSO and coordinate medical examinations IAW AFIs 40-201, 48-139, 48-148, AFMAN 48-125, and AFI 48-109.

2.8.2. Initiate and complete, with BE, an occupational-illness investigation in the AF Safety Automated System (AFSAS) for persons identified as having been potentially overexposed to lasers or other optical radiation.

2.8.3. With the assistance of the Occupational and Environmental Health Working Group (OEHWG), review and approve recommended medical-surveillance examination (MSE) requirements, in addition to those outlined in the ANSI Z136 Series, IAW AFI 48-145, *Occupational and Environmental Health Program,* and AFMAN 48-146, *Occupational and Environmental Health Program Management*.

2.8.4. Ensure medical follow-up examinations are conducted for persons identified as having been potentially overexposed to lasers or other optical radiation.

2.8.5. Work with BE in investigating EMF incidents and provide medical surveillance feedback.

2.8.6. For EMF overexposure incident cases, initiate and complete an occupational illness report (AF Form 190) in the AFSAS, with input from the BE and investigating physician IAW AFI 48-145. The medical provider will document findings in the patient's medical record of overexposure to EMF.

2.8.7. Ensure medical follow-up examinations for EMF overexposed persons are conducted as specified by the DoD EMF Injury Hotline.

2.9. 633 AMDS, Optometry Flight shall

2.9.1. Conduct baseline- and termination-eye examinations for personnel working with class 3B or 4 lasers IAW AFI 48-139.

2.9.2. Document all examinations in individual medical records.

2.10. 633 ABW, Ground Safety and 1FW, Safety shall

2.10.1. Review and recommend policies and procedures to prevent mishaps from ancillary safety hazards such as electrocution, fire hazards, etc. Periodically evaluate procedures and inspect facilities to ensure compliance with federal, military, state, and local safety requirements.

2.10.2. Investigate accidents/incidents related to radiation exposures causing operational impacts, damage to systems and/or sensors or ancillary safety hazards associated with a laser or any optical radiation system IAW AFI 91-204, *Safety Investigations and Reports*.

2.11. 633 CES, Installation Support and Environmental Flight shall

2.11.1. Assist the IRSO with characterizing mixed wastes.

2.11.2. Direct requests for RAM disposal to IRSO.

2.12. Workplace Supervisors shall

2.12.1. Protect the health of personnel by ensuring all operations involving radiation adhere to all radiation safety instructions, technical orders and workplace OIs.

2.12.1.1. Ensure deviations are coordinated and approved by the IRSO.

2.12.1.2. Coordinate all new and revised OIs, pertaining to radiation safety, with the base IRSO prior to publishing.

2.12.2. Conduct and document training IAW AFIs 40-201, 48-139, 48-148, AFMAN 48-125, and AFI 48-109.

2.12.3. Enforce the TLD Program and ensure personnel wear TLD badges IAW AFMAN 48-125.

2.12.4. Provide all necessary personal protective equipment and ensure their proper use.

2.12.5. Inform the IRSO and URSO immediately of new radiation sources (i.e., RAMs, GLDs) or radiation-producing devices (i.e., x-rays, lasers, EMF etc.) or changes to existing sources to ensure all radiation hazards in the workplace are evaluated.

2.12.6. Provide all personnel working with radiation sources or radiation-producing devices, and periodic radiation safety training. Document training on each individual's AF Form 55 or equivalent.

2.12.7. Refer known/declared pregnant females to PH for a pregnancy evaluation within 1 duty day of pregnancy notification.

2.12.8. Report any suspected or alleged overexposures immediately to the IRSO (see chapters three and four respectively).

2.12.9. Notify the IRSO of unsafe work practices or hazardous conditions involving RAM or radiation-producing devices.

2.12.10. Assist the ULSO in implementing AFI 48-139 by developing unit procedures and provides training for workers and visitors, as applicable.

2.12.11. Ensure lasers and optical-radiation systems are either FDA compliant, or in the case of military-specific lasers, have been approved by the AF LSSRB prior to acquisition/fielding. When necessary, request approval from the AF LSSRB through AFSEC/SEW for military-specific lasers.

2.12.12. Ensure that medical treatment is sought immediately in the event of a suspected laser accident/incident.

2.12.13. Immediately report to the ULSO any suspected laser- or optical-radiation overexposure, unsafe conditions, and/or change in usage that could change the hazard assessment.

2.12.14. Ensure users of any Class 1M, 2M, 3R, 3B or 4 FDA-Compliant Laser, military-specific laser, or optical-radiation sources are trained upon initial assignment to the unit and annually thereafter. This extends to those individuals that conduct routine maintenance on any Class 3B or Class 4 embedded lasers. Criteria for training are detailed in the ANSI Z136 Series and AFI 48-139.

2.12.15. Ensure that incidental personnel (e.g., personnel, such as housekeepers, who are not allowed to work around the laser when it is on) are adequately trained in procedures and policies in areas with active lasers or other optical-radiation systems. As a minimum, personnel shall be trained on safe work practices and descriptions of warning signs and hazard zones.

2.12.16. Ensure that visitors receive training, personal protective equipment (PPE) such as laser-eye protection or skin protection (when required), and permission to enter a laser-controlled area. As a minimum, visitors shall be trained on safe work practices, specific hazards and procedures to follow in the event of a suspected overexposure to laser or other optical radiation.

2.12.17. Document training regarding safe use and hazards from lasers and optical radiation sources. Verify the individual user's annual safety training IAW AFI 48-139.

2.12.18. Ensure that the outdoor use of lasers and optical-radiation systems adheres to federal, military, state, and local regulations.

2.12.19. Ensure workers under their supervision are aware of and follow the safety procedures outlined in AFI 48-109, equipment technical manuals, and the unit EMF safety-awareness training program.

2.12.20. Prepare an EMF safety-awareness training plan to provide initial training for newcomers and refresher training for system operators, maintenance personnel, and other workers assigned to duties in Upper Tier as well as action-level environments.

2.12.21. Ensure the EMF safety-awareness training plan includes the topics indicated in Attachment 4 of AFI 48-109.

2.12.22. Coordinate EMF survey and measurement activities with command and supervisory personnel and ensure these individuals are kept informed of the status of all such activities, particularly during investigations of suspected or actual overexposures.

2.12.23. Inform BE and request a hazard-assessment survey for each new EMF system prior to operation. Notify BE of any physical or operational changes that could increase the power density of the field generated by the emitter.

2.12.24. Ensure work areas identified by BE as hazardous-EMF areas are clearly posted.

2.12.25. Ensure proper corrective actions are accomplished according to AFI 91-202, whenever a risk-assessment code is assigned to a hazardous-EMF situation.

2.13. Individuals/workers shall

2.13.1. Comply with AFIs 40-201, 48-139, 48-148, AFMAN 48-125, and AFI 48-109.

2.13.2. Minimize personal exposure to radiation in accordance with radiation-safety training and/or ALARA policy. Follow all safety precautions to ensure exposures to radiation are ALARA (ionizing) or below applicable limits (nonionizing).

2.13.3. Report incidents of suspected overexposures to the supervisor immediately (see Chapters 3 and 4).

2.13.4. Notify the IRSO of any off-duty, non-Air Force radiation work (i.e., in other employment), and provide monitoring results for inclusion in the Master Radiation Exposure Registry.

2.13.5. Individuals on the TLD Program will notify the IRSO before receiving medical-diagnostic testing or treatment involving RAM. If you are not on the TLD program, it is not necessary to contact the IRSO.

2.13.6. Declare their condition to their supervisor and Primary Care Manager if they believe they may be pregnant. Pregnant civilian females should declare their condition to their workplace supervisor.

2.13.7. Report to 633 MDG Emergency Department, for examination as soon as practical, if they believe they have been accidently exposed to radiation sources.

2.13.8. Control laser- and optical-radiation hazards by following procedures in AFI 48-139, CONOPs, TTPs, SOPs, TOs, manuals, and unit instructions.

2.13.9. Ensure that lasers and laser systems are either FDA complaint or, in the case of military-specific lasers, have been approved by the AF LSSRB prior to acquisition/fielding.

2.13.10. Ensure that warning signs, safety devices and personal PPE are functional and in place before operating lasers or optical radiation systems.

2.13.11. Immediately report to the workplace supervisor and the ULSO any suspected laser- or optical-radiation overexposure, unsafe conditions and/or change in usage that could change the hazard assessment.

2.13.12. Ensure that the outdoor use of lasers adheres to federal, military, state, and local regulations.

2.13.13. Follow safe-work procedures given in AFI 48-109, equipment TOs, manuals and unit OIs.

2.13.14. Follow procedures established by the supervisor to ensure safe working conditions.

2.13.15. Ensure required warning signs and safety devices are in place and functional before beginning work.

2.13.16. Immediately report any suspected EMF overexposure and any unsafe work condition to their supervisor.

2.14. 633 CES, Fire and Emergency Services shall

2.14.1. Ensure the location and characteristics of RAM used or stored on JBLE-Langley are properly identified in fire planning and updated as notified by the IRSO.

2.14.2. Ensure fire-protection personnel are trained on the hazards associated with radiation sources.

2.14.3. Notify the IRSO and using agency source custodian of fires in facilities with RAM.

2.14.4. Evaluate procedures and facilities IAW National Fire Protection Association (NFPA) 115, *Standard for Laser Fire Protection*.

2.14.5. Develop emergency response plans, procedures and training lesson plans for firefighting operations involving facilities and systems utilizing Class 3B or Class 4 lasers which have the potential to be a fire hazard (e.g., laboratory/research lasers, laser etchers or tactical lasers).

2.14.6. Ensure firefighters assigned to locations with lasers or any optical-radiation systems having the potential to be a fire hazard receive initial and annual training on emergency response to accidents/incidents involving those systems. In addition to fire-hazard training, this training will include laser-safety training developed by USAFSAM Optical Radiation Branch.

2.15. 633 CES, Readiness and Emergency Management Flight shall

2.15.1. Consult with the IRSO during response operations involving nuclear or radiological materials.

2.16. 633 CES, Engineering Flight shall

2.16.1. Ensure the IRSO is consulted on facility designs that include the storage or use of RAM and/or radiation-producing devices such as x-ray machines.

2.17. 733 LRS, Packing and Crating or Transportation Management Office shall

2.17.1. Ensure all radiation packages are in compliance with 49 CFR 171 through 199, and AFPD 24-2.

Chapter 3

NONIONIZING RADIATION

3.1. Electro-Magnetic Field (EMF).

3.1.1. Unit commanders will establish a unit EMF safety-awareness training program IAW AFI 48-109. BE shall review the program during its routine workplace/shop inspections.

3.1.2. Any incident in which personnel are potentially exposed to EMF in excess of the permissible exposure level will be immediately reported to BE (633 AMDS/SGPB), building 223, DSN 574-7069. Exposure incidents that occur during nonduty hours will be reported to the 633 ABW Command Post, 764-5411. The Command Post will notify BE.

3.1.3. Owning unit commanders must coordinate modification and construction plans for facilities intended for use with operations involving EMF with the IRSO.

3.2. Lasers.

3.2.1. Incidents in which personnel suspect they have been exposed to laser radiation in excess of the maximum permissible exposure or complaints of persistent visual disturbances after working with lasers must be reported to the BE (633 AMDS/SGPB), building 223, DSN 574-7069. After duty hours, call the Command Post, 764-5411. The Command Post will notify BE (633 AMDS/SGPB)

3.2.2. The potentially exposed individuals will report to 633 MDG Emergency Department for examination as soon as practical.

3.2.3. Owning unit commanders must coordinate modification and construction plans for facilities intended for use with laser operations with the IRSO.

3.2.4. Personnel working with laser classes 3B or 4 require reemployment and termination eye examinations IAW AFI 48-139.

3.3. Ultraviolet (UV) Radiation.

3.3.1. Personnel will not be exposed to occupational-produced UV radiation (e.g., welding arcs, damaged metal halide lamps; nondestructive inspections lamps) in excess of the Threshold Limit Value specified in the most current American Conference of Governmental Industrial Hygienist Threshold Limit Values and Biological Exposure Indices booklet. BE will assist shop supervisors and personnel in identifying areas and conducting surveys where hazards may exist.

3.3.1.1. Workers required to perform duties outdoors for extended periods in the sun are urged to keep skin covered (e.g., long-sleeved shirts, hats, etc., consistent with duties and safety requirements) and use sun block on exposed skin.

3.3.2. Incidents in which personnel suspect they have been occupationally exposed to UV radiation or complaints of persistent visual disturbances after working with UV, must seek medical assistance and report the incident to the IRSO (building 223, DSN 574-7069). Exposure incidents that occur during non-duty hours will be reported to the Installation Command Post, ext. 764-5411. The Command Post will notify BE (633 AMDS/SGPB).

Individuals will report to the emergency room for medical assistance. Occupational-related sunburns will not be reported to the IRSO.

3.3.2.1. Any applicable unit-safety incident-reporting procedures will also be followed.

3.3.3. Coordinate modification and construction plans for facilities intended for use with UV radiation operations with the IRSO.

3.4. Non-Air Force organizations, including contractors/subcontractors, who desire to bring a nonionizing radiation source/device onto JBLE-Langley must follow the procedures in Attachment 3.

Chapter 4

IONIZING RADIATION

4.1. Ionizing radiation exposures must be maintained below limits published in 10 CFR 20, AFMAN 48-125 and AFI 48-148, and they will also be kept ALARA. BE will assist shop supervisors and personnel in identifying areas and conducting surveys where ionizing radiation hazards may exist.

4.1.1. Local TLD investigation-action levels are shown in Attachment 2 (if applicable). The IRSO established these on the basis of dose histories in these workplaces and for pregnant workers.

4.2. Personnel involved in radiological operations on JBLE-Langley must use all reasonable means available (i. e., time, distance and shielding) to minimize potential radiation exposure from all ionizing radiation sources (i.e. RAM, GLD, X-rays).

4.2.1. BE manages the TLD program for civil service and USAF personnel at JBLE-Langley IAW AFMAN 48-125. Personnel enrolled in the TLD program will receive TLD training from BE prior to performing radiation duties.

4.2.2. Upon initial assignment, personnel assigned to shops enrolled in the TLD program must contact BE for enrollment in the program and issue of a TLD prior to beginning duties.

4.2.3. Personnel will wear and store their TLDs IAW guidelines provided by BE and AFMAN 48-125. Misuse or mishandling of TLDs (medical-legal documentation), intentional or otherwise, will be investigated.

4.3. All personnel working with RAM (both permitted and exempt GLD) must adhere to safe-and healthful-work practices whenever handling RAM. Obtain additional guidance on safe practices and contamination control from the IRSO (Reference: AFI 40-201 and AFI 48-148).

4.4. Any incident in which personnel are potentially exposed to ionizing radiation in excess of exposure limits must be immediately reported to the BE (633 AMDS/SGPB), building 223, DSN 574-7069. Exposure incidents that occur during nonduty hours will be reported to the 633 ABW Command Post, 764-5411. The Command Post will notify BE (633 AMDS/SGPB).

4.4.1. Supervisors must account for all affected personnel and be assembled in an area away from the hazard area. Do not allow personnel to leave the area until cleared by the IRSO or designated representative. Note: Record events leading to exposures, including circumstances, operating parameters, amount and type of isotopes if applicable, names of personnel exposed, where the incident occurred, and an estimate of the extent of contamination (if RAM or GLD is dispersed).

4.4.2. Within 5 working days from the date of the incident, the IRSO must receive a complete written report from the user. The report must contain a detailed description of the incident, a chronological description of how the incident was handled and preventive measures taken to ensure the incident will not be repeated. Other reporting instructions are detailed in AFI 40-201 and AFI 48-148. The IRSO will communicate with the ACC/SGPB

and the USAF RIC as necessary. Note: The USAF RIC makes all required notices to the Nuclear Regulatory Commission.

4.4.3. Any applicable unit safety-incident reporting procedures will also be followed.

4.4.4. New or modified uses of RAM or ionizing radiation-producing devices must be reported to and approved by the IRSO.

4.5. Modifications and Construction Plans.

4.5.1. Facilities intended for use with operations involving ionizing radiation or RAM must be coordinated with the IRSO.

4.6. USAF RAM Permits.

4.6.1. Permitted RAM will be handled IAW AFI 40-201.

4.6.2. The IRSO will determine if a permit or license is needed before anyone can possess or use RAM.

4.6.3. The requestor must submit applications for permits through the IRSO. The requestor will prepare the application in accordance with AFI 40-201, paragraph 3.3.2.

4.6.4. Organizations desiring to renew an expiring RAM permit should contact the IRSO at least 60 days prior to the permit expiration date. Renewal will consist of preparation and submission of a complete, stand-alone application to the USAF RIC.

4.6.5. Organizations with permits no longer requiring the use of RAM should transfer, terminate or dispose of the material. Transfer, termination or disposal guidelines are outlined in AFI 40-201, paragraphs 3.7, 3.15 and 3.14 respectively. Contact the PRSO and IRSO for assistance with transfer, termination or disposal.

4.6.6. The PRSO must ensure all permitted RAM is leak-tested and inventoried IAW the permit conditions.

4.6.7. The unit or organization permittee shall retain custodianship, control, receipt, storage, and issue of NRC licensed RAM covered by an AF-held license.

4.7. General Licensed Device.

4.7.1. GLDs will be handled IAW 10 CFR 31.5 and USAF RIC guidance.

4.7.2. The IRSO must ensure all general-licensed devices are leak-tested and inventoried IAW 10 CFR 31.5 or manufacturer’s specifications, whichever is stricter.

Chapter 5

ALL OTHER RAM USAGE.

5.1. Organizations acquiring/using RAM and/or radiation-producing devices through any contracting mechanism (e. g., US Army Corps of Engineers, SABER, GSU, Ops/Main, contracts etc.) must:

5.2. Comply with AFI 40-201 requirements for non-Air Force use of RAM and radiation-producing devices.

5.2.1. Non-Air Force organizations must send written requests to the IRSO at least 30 calendar days prior to use. The request must include the information listed in Attachment 3.

5.2.2. For contractors, these requirements must be included in the statement of work.

5.2.2.1. Contractors will not bring RAM onto JBLE-Langley without the written consent of the IRSO.

Chapter 6

RAM RECEIPT OR SHIPMENT

6.1. Shipping and receiving RAM (including GLDs) must be done in accordance with 10 CFR 71 and 49 CFR 171 through 199, and AFPD 24-2.

6.2. Shipping and receiving procedures are summarized in Attachment 4.

6.3. The IRSO will provide instructions and assistance as needed.

Chapter 7

RAM STORAGE

7.1. Keep all RAM in a RAM storage area or a locked enclosure separate from other items to ensure personnel not familiar with RAM are not accidentally exposed to ionizing radiation. Proper storage techniques and labeling requirements are outlined in AFI 40-201 and 10 CFR Part 20.

7.2. A storage area from which RAM has been permanently removed must be surveyed by qualified individual approved by the IRSO. Written clearance must be received before the area may be used for other purposes.

Chapter 8

RAM MOVEMENT ON JBLE-LANGLEY

8.1. Personnel must account for the location of RAM and prevent the movement of RAM to unauthorized persons or locations, without adequate handling or storage facilities. Notify the IRSO if you plan to move RAM.

8.1.1. Transport RAM off installation only in adequately shielded and authorized containers per Department of Transportation (DOT) regulations (49 CFR 171-199) and as authorized by the permit.

8.1.2. Vehicles will require the appropriate DOT placards.

8.1.3. All users must have proper survey instruments when transporting RAM. Ask BE for assistance; DSN 574-7069.

Chapter 9

RAM DISPOSITION

9.1. Disposition of licensed/permitted RAM may only be carried out by transfer to another licensed agency or to a licensed disposal contractor IAW AFI 40-201.

9.2. Disposal of RAM is the responsibility of the using organization. Disposal procedures for Air Force-owned RAM are specified in AFI 40-201.

CAROLINE M. MILLER, Col, USAF
Commander

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

10 CFR Part 20, *Standards for Protection Against Radiation*

10 CFR Part 31.5, *NRC General License Requirements*

10 CFR Part 71, *Packaging and Transportation of Radioactive Material*

21 CFR 1040.10, *Laser Products*

21 CFR 1040.11, *Specific Purpose Laser Products*

29 CFR 1910.1096, *Ionizing Radiation*

49 CFR Parts 171 through 199, *Transportation Requirements*

DODI 4160.21-M, *Defense Materiel Disposition Manual*

AFI 40-201, *Radioactive Materials (RAM) Management*, 17 September 2014

AFI 48-139, *Laser and Optical Radiation Protection Program*, 30 September 2014

AFI 48-145, *Occupational and Environmental Health Program*, 22 July 2014

AFI 48-148, *Ionizing Radiation Protection*, 20 November 2014

AFI 84-103, *United States Air Force Heritage Program*, 22 May 2015

AFI 90-202, *The US Air Force Mishap Prevention Program*, 24 June 2015

AFI 91-204, *Safety Investigations and Reports*, 12 February 2014

AFI 48-109, *Electromagnetic Field Radiation (EMFR) Occupational and Environmental Health Program*, 1 August 2014

AFMAN 48-125, *Personnel Ionizing Radiation Dosimetry*, 04 October 2011

AFMAN 48-146, *Occupational & Environmental Health Program Management*, 9 October 2012

AFPD 24-2, *Preparation and Movement of Air Force Materiel*, 27 April 2011

SG NOTAM 14-002, *Improper Transfer of Generally Licensed Devices containing Radioactive Material*, 12 November 1996

Prescribed Forms

No prescribed forms.

Adopted Forms

AF Form 55, *Employee Safety and Health Record*

AF Form 190, *Occupational Illness/Injury Report*

AF Form 847, *Recommendation for Change of Publication*

US Nuclear Regulatory Commission (NRC) Form 241, *Report of Proposed Activities in Non-Agreement States, Areas of Exclusive Federal Jurisdiction, or Offshore Waters*

Abbreviations and Acronyms

ALARA— As Low As Reasonably Achievable

GLD— Generally Licensed Devices

IRSO— Installation Radiation Safety Officer

IR— Ionizing Radiation

LASER—— Light Amplification by Stimulated Emission of Radiation.

LSO— Laser Safety Officer Unit Laser Safety Officer

PRSO— Permit Radiation Safety Officer

RPD - Radiation—Producing Devices

RAM— Radioactive Materials

TLD— Thermoluminescent Dosimeter

ULSO— Unit Laser Safety Officer

Attachment 2

ABNORMAL EXPOSURE CRITERIA

A2.1. Abnormal Exposure Criteria. The IRSO will investigate any reported exposure levels above the IALs listed below to determine any corrective actions needed to prevent any future overexposures. If the investigation determines the reported exposure to be incorrect, the individual's reported dose will be corrected by reviewing historical doses for the individual and the highest dose received in the monitoring period by other personnel within the workplace.

Table A2.1. Investigation Action Levels

Workplace	Levels (IAL)
All TLD issued workplaces	125 mrem / quarter
Pregnant workers	50 mrem in a month

Attachment 3

NON-AIR FORCE USE OF RADIATION SOURCES APPLICATION REQUIREMENTS

A3.1. Use of RAM:

A3.1.1. Air Force Instruction 40-201, *Radioactive Materials (RAM) Management,* sets USAF policy for using radioactive materials (RAM). It applies to all civilians, civilian contractors, Department of Defense, Department of Energy (DOE), and DOE prime contractor personnel bringing RAM onto Air Force installations.

A3.1.2. Non-Air Force organizations that bring RAM onto USAF installations, or conduct operations involving RAM on USAF installations, must obtain the approval in writing of the installation commander or his designee. To obtain this approval, the contractor must forward an application to the IRSO (633 AMDS/SGPB), building 223, DSN 574-7069, with a courtesy copy to the contracting officer at least 30 calendar days before the planned date for commencement of activities on the installation. Contractors operating at JBLE-Langley will forward the following requirements to the IRSO via the Contracting Officer:

A3.1.2.1. A description of the proposed activities on NRC Form 241.

A3.1.2.2. the procedures established to ensure radiological health and safety of Air Force personnel and the public while on Air Force installations; 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.

A3.1.2.3. a current copy of the applicable NRC or Agreement State License. Expired licenses are unacceptable. To be valid at the installation, the license must either specifically state the installation by name on the license or state approval for work at temporary job sites anywhere in the United States where the NRC or Agreement State maintains jurisdiction. DOE or DOE prime contractors must provide, in lieu of a license, written certification of their exemption from NRC licensing requirements and cite the applicable exemption of 10 CFR.

A3.1.2.4. The part of the Air Force contract describing work to be done at the installation and the inclusive dates of such work.

A3.1.2.5. An acknowledgement that the IRSO can make periodic checks to ensure the contractor is following applicable radiological health and safety practices, which prevent unnecessary exposures to Air Force personnel and prevent potential contamination of government property. The IRSO must identify deficiencies to the contracting officer for corrective actions. In addition, the IRSO have authority to suspend contractor operations believed to be unsafe.

A3.1.2.6. Copies of the most recent leak-test results (not over 180 days old) for sealed sources.

A3.1.2.7. Copies of training certificates for authorized users.

A3.1.2.8. Contractors will adhere to 10 CFR and 49 CFR sections pertaining to transportation of RAM.

A3.1.2.9. Contractors must notify the IRSO when RAM arrives on installation or when RAM is removed from the installation.

A3.2. Use of Lasers:

A3.2.1. Non-Air Force organizations required to use laser Classes 3B or 4, on JBLE-Langley property must submit a written request for approval at least 30 calendar days before commencement of activities, which require the use of a laser.

A3.2.2. Contractors must submit their request to IRSO (633 AMDS/SGPB), building 223, DSN 574-7069, with a courtesy copy to the contracting officer, and will include:

Table A3.1. Description/Characteristics:

Manufacturer
Model
Number of same units
Serial numbers
Laser medium
Mode of operation (i.e. continuous wave (CW), single pulse, multiple pulse)
Maximum exposure time (train length)
Time (sec) & wavelength
Energy/pulse (J) or CW power (W)
Pulse repetition frequency
Pulse width
Beam diameter (at 1/e point)
Beam divergence (at 1/e point)

A3.2.2.1. The part of the Air Force contract describing work to be done at the installation and the inclusive dates of such work. Additional information required to be included: where the laser will be used (location, indoors, outdoors, enclosures, etc.), and the safety features of the device.

A3.2.2.2. An acknowledgement that the IRSO can make initial and periodic checks to ensure the contractor is following applicable radiological health and safety practices, which prevent unnecessary exposures to Air Force personnel.

A3.3. Use of EMF:

A3.3.1. Non-Air Force organizations required to use equipment generating EMF in excess of 7 watts peak power and a frequency of 100 MHz or greater on JBLE-Langley property must submit a written request for approval at least 30 calendar days before commencement of activities, which require the use of the RF generating device.

A3.3.2. Contractors must submit their requests to 633 AMDS/SGPB, building 223, DSN 574-7069, with a courtesy copy to the contracting officer; and will include:

Table A3.2. Description/Characteristics:

Description
Nomenclature
Location of emitters
Quantity
Frequency (MHz)
Pulse width (microsecond)
Pulse repetition freq. (pps)
Peak power (kW)
Antenna size (feet--horizontal/vertical)
Antenna band width (degrees--horizontal/vertical)
Antenna gain (dB)
Scan rate (rpm)

A3.3.2.1. The part of the Air Force contract describing work to be done at the installation and the inclusive dates of such work. Additional information required to be included where the EMF-generating device will be used (location, indoors, outdoors, enclosures, etc.), and the safety features of the device.

A3.3.2.2. An acknowledgement that the IRSO can make initial and periodic checks to ensure the contractor is following applicable radiological health and safety practices which prevent unnecessary exposures to Air Force personnel.

A3.4. Use of Ionizing Radiation Generating Devices:

A3.4.1. Non-Air Force organizations required to use ionizing radiation-producing devices (for RAM, see Section 1) on JBLE-Langley must submit a written request for approval, at least 30 calendar days before commencement of activities, which require the use of ionizing radiation-producing devices.

A3.4.2. Contractors must submit their request to IRSO (633 AMDS/SGPB), building 223, DSN 574-7069, with a courtesy copy to the contracting officer; and will include:

Table A3.3. Description/Characteristics:

X-ray unit manufacturer
Model number
Serial number
Maximum kVp, mA, Sec
Ionizing radiation source/emitter (electron tube)

A3.4.2.1. The part of the Air Force contract describing work to be done at the installation and the inclusive dates of such work. Additional information required to be included: where the ionizing radiation-producing device will be used (location, indoors, outdoors, enclosures, etc.), and the safety features of the device.

A3.4.2.2. An acknowledgement that the IRSO can make initial and periodic checks to ensure the contractor is following applicable radiological health and safety practices, which prevent unnecessary exposures to Air Force personnel.

Attachment 4

BASIC RAM SHIPPING PROCEDURES

A4.1. Every Receiving or Shipping Agency:

A4.1.1. Must have a separate, marked and locked enclosure for the receipt, handling or shipment of radioactive packages. This separate area is to ensure personnel not familiar with the proper handling of RAM are not accidentally exposed to ionizing radiation. This location must be coordinated with IRSO (633 AMDS/SGPB), building 223, DSN 574-7069.

A4.2. All RAM Covered by License or Permit:

A4.2.1. Must be accounted for by a RAM transfer receipt, which is separate from any contractual, security or other receipt documents. **Contract shipping and receiving agencies should obtain transfer receipts when items are dispensed to the 633 ABW organizations.**

A4.3. When RAM is Received or Shippedictect**from JBLE-Langley**:

A4.3.1. The IRSO must be contacted by the receiving or shipping agency. The IRSO or designated representative will monitor the container. **If the receiving or shipping agency is a contractor, the contractor is not required to notify the**ictect**IRSO. The contractor must perform all labeling, packaging and monitoring requirements**ictect**outlined in the federal law. Note:** In accordance with 10 CFR 20.1906, all packages labeled with a Radioactive White I, Yellow II, or Yellow III, as specified DOT regulations (49 CFR 172.403 and 172.436-440), must be monitored as soon as possible but not later than 3 hours after the package is received. If the package is received after normal duty hours, the package must be surveyed no later than 3 hours from the beginning of the next workday.

A4.3.2. If the RAM received is a sealed source, the most recent leak-test results must accompany the package and a copy of these results must be sent to the IRSO. If this test does not accompany the sealed source, an individual approved by the IRSO performs the leak test before the item is placed into use. Current leak-test results must accompany sealed sources shipped from JBLE-Langley.

A4.3.3. Once the package has been monitored and cleared by an individual approved by the IRSO, contact the user or custodian and transport the material directly to the user or custodian. If the user or custodian cannot be located, store the RAM until the user or custodian accepts receipt. **Note:** Only authorized personnel will open or package containers of RAM and its associated items.

A4.4. If the RAM is to be transported from JBLE-Langley, prepare for shipment and packaging per applicable NRC and Department of Transportation regulations. Contact the IRSO for assistance and shipping surveys.