

**BY ORDER OF THE
375TH AIRLIFT WING COMMANDER**



**SCOTT AIR FORCE BASE
INSTRUCTION 48-104**

7 OCTOBER 2003

Aerospace Medicine

***MAINTAINING EXPOSURES TO RADIATION
AND RADIOACTIVE MATERIALS TO LEVELS
THAT ARE AS LOW AS REASONABLY
ACHIEVABLE (ALARA)***

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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This instruction provides Scott AFB policy on a program that limits exposures of personnel to radiation sources including radioactive materials to levels as low as reasonably achievable (ALARA); applies to Scott AFB tenants, civilian contractors, and other personnel who have been granted access to Scott AFB; summarizes and implements existing mandatory ALARA concepts found in federal, state, and Air Force Instructions and policies.

SUMMARY OF REVISIONS

This instruction updates Scott AFB policy and information; revises the organizational structure; and revises new ALARA investigation action levels (**Attachment 2**). A bar (|) indicates revision from the previous edition.

1. Responsibilities and Procedures.

1.1. Installation Commander.

- 1.1.1. Issues and directs Scott AFB policy concerning ALARA procedures and the best management practices.
- 1.1.2. Appoints the Base Radiation Safety Officer (RSO) in writing.

2. 375th Logistics Readiness Squadron (375 LRS), TekStar, Inc., Base Supply Contractor; 375th Medical Supply, Director of Medical Logistics; and all other procurement agencies.

- 2.1. Ensures Base RSO reviews any requests processed by their organization for procurement of radioactive materials and radiation-producing devices, including Class 3 and 4 lasers.

2.2. Ensures the Base RSO is notified of proposed dates of shipment or receipt of radioactive materials as required by AFI 40-201, *Managing Radioactive Materials in the U.S. Air Force*.

2.3. Ensures the Base RSO is notified immediately of any turn-in for disposal or reuse of suspected radioactive material (RAM).

3. Squadron Commanders.

3.1. Implement Scott AFB ALARA policies and actively promote ALARA concepts.

3.2. Issue and direct organizational policy concerning ALARA procedures and the best management practices.

3.3. If an organization is responsible for radio frequency (RF) emitters, appoint the organization's Unit RSO for RF radiation in writing.

3.4. Appoint the Permit RSO for the unit's RAM permits in writing.

3.5. Forward copies of these appointment letters to Bioenvironmental Engineering Flight (BEF).

4. The 375th Contracting Squadron (375 CONS).

4.1. Reviews functional activities requirements package to ensure the requirements have been reviewed by the Base RSO when delivery or use of RAM is involved in contract performance.

4.2. Informs Base RSO of preconstruction meetings when attending contractors plan to use RAMs or other forms of radiation during contract execution. During administration of the contract, 375 CONS will ensure contractor compliance with RAM requirements of the contract.

4.3. Ensures contractors using RAM on Air Force installations have Base RSO approval in accordance with AFI 40-201, paragraphs 1.16., 3.3.3., and 3.3.4. before bringing RAM or radiation-producing devices on Air Force property. The contractor must contact the Base RSO at least 15 days prior to intended use, so adequate time is provided to ensure proper licensing or permitting.

5. The 375th Civil Engineering Squadron (375 CES) Construction Management.

5.1. Ensures Base RSO has reviewed and signed off on all submittal requests by contractors to use RAM or X-ray equipment.

5.2. Ensures contractors using RAM on Air Force installations have Base RSO approval in accordance with AFI 40-201, paragraphs 1.16., 3.3.3., and 3.3.4. before bringing RAM or radiation-producing devices on Air Force property. The contractor must contact the Base RSO at least 15 days prior to intended use so adequate time is provided to ensure proper licensing or permitting.

6. The 375th Logistics Readiness Squadron (375 LRS), TekStar, Inc., Base Supply Contractor.

6.1. Ensures a separate, properly posted, and secure area is set up for storage of RAM.

6.2. Secures approval from the Base RSO prior to accepting RAM shipments. Upon receipt of RAM, ensures the Base RSO or representative is notified so that monitoring of the item is accomplished in accordance with 10 CFR 20.1906, *Procedures for Receiving and Opening Packages*, prior to issuing RAM to the receiving sections.

6.3. Reports discrepancies in packaging, etc., of all RAM received.

6.4. Ensures all personnel handling or storing RAM are trained in the safety and storage procedures of RAM.

7. The 375 LRS, Distribution Flight.

7.1. Ensures a separate, properly posted, and secure area is set up for inbound and outbound RAM; ensures area is approved by the Base RSO.

7.2. Reports discrepancies in packaging, etc., of all RAM received.

7.3. Ensures personnel handling or storing RAM are trained in the safety and storage procedures of RAM; ensures personnel are trained on 49 CFR requirements for shipping RAM.

7.4. When receiving RAM for shipment, contact the BEF at 256-7307 to perform surveys of packages that are shipped.

7.5. Upon receipt of RAM for use on Scott AFB, the Base RSO and individual user or appropriate storage organization, will be notified immediately so preparations for storage and handling can be made. The Base RSO can be reached at 256-7307. Qualified personnel from BEF will monitor the radiation intensity on the external surface of the container. A visual inspection of the container will be made to ensure seals have not been broken or tampered with and container has not been damaged in transit.

8. Contractor's use of RAM.

8.1. General. Procedures for control of RAM brought on Scott AFB by contractors must be followed.

8.2. Responsibilities:

8.2.1. The 375 CES and 375 CONS will ensure all contract statements of work (SOW) have a clause preventing unauthorized RAM from being brought on Scott AFB. Contracting will verify this clause is contained in the SOW prior to going out for bids. The 375 CES will ensure that contracts, which are executed via IMPAC card, address RAM authorization procedures and use.

8.2.2. Contracting officers will ensure contractors are approved for using RAM by the Base RSO prior to bringing it on the installation. A written request should be submitted to the base contract administrator, through the contract inspector, and to the Base RSO 15 days prior to the intended use. No work involving RAM may proceed until the Base RSO approves the request. Request will include:

8.2.3. A copy of the contractor's RAM permit and amendments along with the written request.

8.2.4. A brief description of the intended activities and a base diagram depicting the route and times the RAM will be on base.

8.2.5. The Base RSO is responsible for overseeing the contractor's use of RAM.

8.2.6. The contracting officer shall ensure that all radioluminescent signs removed by a contractor are turned into the 375 CES Operations Flight for proper disposal. The 375 CES/CEO will coordinate disposition with the Base RSO.

9. Base RSO.

- 9.1. Manages the Personnel Dosimetry Program, performs radiation surveys, and reviews all plans for modifications of facilities that will use RAM or radiation-producing sources.
- 9.2. Reviews procedures for radioactive permitting, licensing, receiving, and shipping of RAM or radiation-producing sources.
- 9.3. The Base RSO ensures radiation safety training is being conducted for all individuals working in or frequenting any portion of an area where RAM or radiation-producing sources are used.
- 9.4. The Base RSO will review, at least annually, the ALARA Program at Scott AFB including this instruction and each organization's ALARA Program.
- 9.5. The Base RSO will review contractor use of RAM 15 days prior to use on base.

10. Permit RSO.

- 10.1. Ensures compliance with each requirement specified in the RAM permit.
- 10.2. Ensures that each employee working with or around the permitted RAM is aware of the Scott AFB commitment to the ALARA concept.
- 10.3. Ensures that each employee working with or around the permitted RAM is properly trained.
- 10.4. Examines operational procedures and practices concerning the permitted material to ensure their compatibility with the ALARA concepts.
- 10.5. Delegates some responsibilities to the trained Unit RSO.

11. Unit RSO.

- 11.1. Calls the BEF at 256-7307 immediately if there is suspected overexposure to ionizing radiation or RF energy.
- 11.2. Examines operational procedures and practices within the organization to ensure their compatibility with the ALARA concepts.
- 11.3. Notifies the BEF when procedures change or new emitters are procured.

12. Supervisor. Ensures that each employee under his or her responsibility is aware of the Scott AFB commitment to the ALARA concept.

13. Employee. Suggests to the supervisor any improvements in practices and procedures that would support the ALARA concept.

14. Quality Assurance Program.

- 14.1. The Base RSO will establish personal ionizing radiation dosimetry levels, which are utilized as a guide in determining surveillance and control requirements. These action levels are provided in [Attachment 2](#), Table 1, and are upgraded from 29 CFR 1910.1096, *Occupational Health Standard*, and 10 CFR 20.1201, *Occupational Dose Limits for Adults*.
- 14.2. If ALARA Level I is exceeded, the Base RSO must conduct an investigation of the exposure and recommend any actions to reduce the exposure levels. A written report is not required.

14.3. If ALARA Level II is exceeded, the Base RSO must conduct an investigation into the exposure and provide a written report to the individual and his supervisor. The report should recommend changes in procedures to reduce exposure levels.

14.4. If the occupational standard is exceeded, a formal investigation and documentation are required in accordance with AFI 48-125, *The U.S. Air Force Personnel Dosimeter Program*.

14.5. Personnel dosimeter results for pregnant workers will be reviewed by the Base RSO monthly and documentation maintained on actions taken to ensure that the total dose to the fetus does not exceed 500 millirem (mrem) during the term pregnancy. Positive efforts will be made to limit the dose to no more than 50 mrem per month.

14.6. The Base RSO will conduct an annual review of the ALARA Program and the personnel ionizing dosimetry. If the review identifies significant problems or if recommendations are made that have a base-wide impact, the Base RSO should present the results of the review to the Scott AFB Air Force Occupational Safety and Health (AFOSH) Council.

BARBARA J. FAULKENBERRY, Col, USAF
Commander

Attachment 1**GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

10 Code of Federal Regulations (CFR) 20.1201, *Occupational Dose Limits for Adults*
10 CFR 20.1201, *Occupational Dose Limits for Adults*
29 CFR 1910.1096, *Ionizing Radiation*
29 CFR 1926, Occupational Safety and Health Standards (OSHA), *Construction Industry Standard*
10 CFR 20, *Standards for Protection Against Radiation*
49 CFR, *Transportation*
AFI 40-201, *Managing Radioactive Materials in the U.S. Air Force*
AFI 48-125, *The U.S. Air Force Personnel Dosimeter Program*
AFI 48-148, *Ionizing Radiation Protection*
AFOSHSTD 48-9, *Radio Frequency Radiation (RFR) Safety Program*

Abbreviations and Acronyms

BEF—Bioenvironmental Engineering Flight
CES—Civil Engineering Squadron
CONS—Contracting Squadron
LRS—Logistics Readiness Squadron
MREM—Millirem
PRECON—Pre-Construction Meeting
RAM—Radioactive Material
RF—Radio Frequency
SOW—Statement of Work

Terms

ALARA Concept—Concept based on the philosophy that all exposures to radioactive materials and radiation-producing sources must be limited to the lowest possible levels. This statement presupposes that no exposures to radiation should occur without a positive net benefit. Implicit in this assumption is that an exposure to radiation, however small, carries with it some detriment or probability of risk that should be balanced by an offsetting benefit. While the established maximum permissible exposure levels are conservative and offer a low risk of adverse health effects compared to other hazards of life and occupation, it is prudent that every effort be made to reduce exposures to the lowest level possible. The ALARA approach appears to best satisfy the need for a practical, yet conservative goal to limit personnel exposures to radiation.

Base Radiation Safety Officer (RSO)—An individual designated by the installation commander to manage the Radiation Safety Program.

Permit RSO—An individual designated by the unit commander and approved by the USAF Radioisotope Committee to manage the radiation protection aspects associated with the use of RAMs for which a specific USAF Radioactive Material Permit has been issued. Notification should be given to the BEF of the designation of a Permit RSO and any subsequent changes.

Unit RSO—An individual appointed by the organizational commander, who manages RAM covered under a permit and/or RF emitters, in accordance with AFOSHSTD 48-9, *Radio Frequency Radiation (RFR) Safety Program*. The Unit RSO may manage other ionizing or non-ionizing radiation sources in accordance with applicable regulations. The Unit RSO should be appointed, in writing, and notification given to the BEF of appointment and subsequent changes.

Attachment 2

**OCCUPATIONAL STANDARDS AND ALARA
INVESTIGATION ACTIONS LEVELS
(UNITS IN MILLIREM)**

<u>TYPE OF EXPOSURE</u>	<u>Occupational Standard</u>	<u>*Level I</u>	<u>**Level II</u>
Eye Dose Equivalent (LDE)	3,750/qtr 1,250/mo	938/qtr 313/mo	1,875/qtr 625/mo
Deep Dose Equivalent (DDE) (External Whole Body)	1,250/qtr 417/mo	313/qtr 104/mo	625/qtr 208/mo
Shallow Dose Equivalent (SDE) (Skin of the Whole Body or Extremities)	12,500/qtr 4,167/mo	3,125/qtr 1,042/mo	6,250/qtr 2,084/mo
Total Effective Dose Equivalent (TEDE)	1,250/qtr 417/mo	313/qtr 104/mo	625/qtr 208/mo
Pregnant Females	***500	25/mo	50/mo

* 25% of the occupational limit

** 50% of the occupational limit

***over gestation period