



# ORIGINAL ORDERS

UNITED STATES MARINE CORPS

MARINE CORPS AIR STATION  
BEAUFORT, SOUTH CAROLINA 29904-5001

IN REPLY REFER TO:

ASO 5104.1 W/CH 1

DSS

4 NOV 2004

AIR STATION ORDER 5104.1 W/CH 1

From: Commanding Officer  
To: Distribution List

Subj: RADIATION SAFETY PROGRAM (RSP) STANDARD OPERATING PROCEDURES

Ref: (a) MCO 5104.3  
(b) Title 10 Code of Federal Regulations  
(c) Title 49 Code of Federal Regulations  
(d) NAVSEA Technical Manual S0410-00-RAD-010 (NOTAL)  
(e) NAVMED P-5055

Encl: (1) Locator Sheet

1. Situation. To provide guidance for the safe use, handling, transportation, storage and disposal of radioactive material (RAM) per references (a) through (e).

2. Mission. To provide guidance in complying with applicable regulations, orders, licenses, and permits to all government personnel assigned permanently or temporarily, visiting aircraft and military units, and, to a limited degree, contractor working with RAM aboard the Air Station.

3. Execution

a. Commander's Intent and Concept of Operation

(1) Commander's Intent

(a) To protect military and civilian personnel from the harmful effects of ionizing radiation. Therefore, all exposures to ionizing radiation will be kept as low as reasonably achievable (ALARA) as mandated by the Nuclear Regulatory Commission (NRC).

(b) To implement a comprehensive RSP which is consistent with applicable standards.

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(2) Concept of Operations. This manual provides guidance for the safe use, handling, transportation, storage and disposal of RAM. All RAM and sources shall be considered hazardous. Any use, possession, storage, transfer, and disposal activities that involve such items, are prohibited until appropriate safety precautions have been established. No personnel shall be permitted to participate in any of the above activities until appropriately trained and until the provisions of this manual have been met.

b. Tasks

(1) Director of Safety and Standardization. Shall maintain overall cognizance of the Radiation Safety Program.

(2) Department Heads, Commanding Officers and Directors. Of those sections having cognizance of, or personnel who may come in contact with, ionizing radiation will appoint in writing qualified Command Radiation Safety Officers (CRSO) and Radiation Protection Assistants (RPA) as needed to ensure compliance.

(3) Installation Radiation Safety Officer (IRSO). Shall oversee the conduct of the RSP as outlined in Chapter 1 of this manual.

(4) Subordinate Element Missions

(a) Comply with the intent and content of this manual and the enclosures.

(b) Take positive and continuous action to implement this program.

(c) Provide sufficient documentation to demonstrate compliance.

(d) Ensure that local SOP's for radiation safety are developed and followed.

(e) Coordinate all aspects of the RSP with the IRSO.

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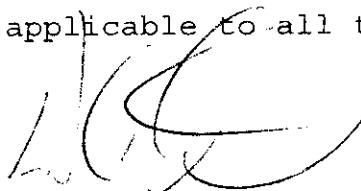
(5) All tenant units aboard the installation will maintain their own RSP per reference (d) and provide correspondence, notification, and access relative to their RSP to the Department of Safety and Standardization at their request.

4. Administration and Logistics. The Commanding Officer of MAG-31, and all other tenant units aboard this installation concur with this Order insofar as it pertains to members of their command.

5. Command and Signal

a. Signal. This Order is effective the date it is signed.

b. Command. This Order is applicable to all tenant units aboard MCAS Beaufort.



H. A. STOCKWELL

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## CHAPTER 1

### RADIATION SAFETY PROGRAM ELEMENTS

1000. PURPOSE. The RSP is designed to prevent the unnecessary exposure of personnel to and contamination of equipment with ionizing radiation, to identify the requirements for compliance with NRC licenses and Naval Radioactive Material Permits (NRMP's), and to establish procedures and practices for meeting these requirements. These procedures include provisions for storage, use, possession, transportation and disposal of RAM and training required for personnel involved in any of these activities.

#### 1001. BACKGROUND

1. Safety standards for ionizing radiation from RAM material and other radiation sources are derived from a variety of federal regulations. The NRC has primary responsibility for regulating RAM and it grants permission to receive, possess, distribute, use, transport, transfer and dispose of RAM under special conditions established in individual licenses.
2. COMNAVSEASYS COM Detachment, Radiological Affairs Support Office (RASO) at Yorktown, VA, manages the Radiological Affairs Support Program (RASP). The RASP includes responsibility for all aspects of radiation safety and control of radiation from licensable and non-licensable RAM, including radioactive waste, but excluding radioactive sources used for medical treatment or diagnosis, radioactivity associated with naval nuclear propulsion, and nuclear weapons.
3. The IRSO is the appointed individual, at the installation level, who is responsible for coordinating the installation RSP for sources of radiation physically located on that installation. The position is located in the Department of Safety and Standardization (DSS) Office aboard the Air Station. The IRSO establishes procedures to ensure proper use, handling and control of RAM involving receipt, storage, shipping, and disposal operations by station, visiting units, and tenant commands.

4. The CRSO is the designated individual at the tenant command, user activity, or unit level, tasked with direct oversight of radiation safety practices and procedures. The CRSO ensures proper RAM shipping, receipt, and inventory tracking. The CRSO coordinates with the IRSO to ensure compliance with the Installation Radiation Protection Program (RPP) procedures, provides the IRSO with periodic inventory listings RAM held at the command, promptly notifies the IRSO when finding broken, damaged or missing radioactive sources or whenever radioactive contamination is found or suspected. The CRSO also assists the IRSO in the management of local RRP's, including, but not limited to, monthly and quarterly surveys, routine personnel dosimetry, bioassay collection, local training and emergency drills.

1002. POLICY. To protect military and civilian personnel from the harmful effects of ionizing radiation exposures. Therefore, all exposures to ionizing radiation will be kept ALARA. This is accomplished through the RSP, which is consistent with applicable standards. All RAM and sources shall be considered hazardous. Any use, possession, storage, transfer, or disposal activity involving such items is prohibited until appropriate safety precautions have been established. No personnel shall be permitted to participate in any of the above activities until appropriately trained and until the provisions of this manual have been met.

1003. RESPONSIBILITY

1. The Commanding Officer shall appoint in writing an IRSO and ARSO who meet the qualifications as described in accordance with the current MCO 5104.3.

2. Department Heads, Commanding Officers and Directors having cognizance of, or personnel who may come in contact with, ionizing radiation must ensure that the provisions of all requirements have been met and an internal SOP meeting the requirements contained in the current MCO 5104.3, but modified to meet their unique circumstances, is published. They must appoint in writing a CRSO to conduct the unit level RPP and ensure compliance with training requirements.



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3. Director of Safety and Standardization shall maintain overall cognizance of the RSP.
4. Installation Radiation Safety Officer (IRSO)
  - a. Shall oversee the conduct of the Radiation Safety Program (RSP).
  - b. Will conduct periodic inspections of operations involving RAM, sources, or commodities to ensure compliance with program requirements and conduct or oversee non-routine activities relating to RAM.
  - c. Will develop, coordinate and participate in training and orientation programs for occupationally exposed individuals and other personnel as required by the references.
  - d. Will conduct semi-annual reviews of dosimetry records, and health records, and maintain liaison with the Radiation Health Officer (RHO) in order to coordinate the RSP with the Radiation Health Program (RHP).
  - e. Will perform surveys and inspections as required to ensure compliance with the references and NRMPs.
  - f. Will provide advice and assistance regarding all matters pertaining to radiation safety and act authoritatively for the Commanding Officer to ensure that RPP deficiencies are corrected expeditiously and that personnel exposure to sources of ionizing radiation are maintained ALARA.
5. Assistant Radiation Safety Officer (ARSO) shall assist the IRSO in maintaining an effective RSP and act as the IRSO in the absence of the IRASO.

1004. CONTRACTORS AND OTHER NON-DOD AGENCIES

1. Contractors and other non-DoD agencies shall implement their own RSP that meets all pertinent radiation protection standards. Where contractors are performing work aboard the Air Station, the following provisions apply:
  - a. The contractor shall provide an RSO who will act as such for contractor personnel.

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b. Marine Corps personnel shall not perform radiation services for contractor personnel as performance of such functions may involve assumption of liability.

2. Where Marine Corps and contractor personnel are to work together in areas where RAM or ionizing radiation may be present, the contractor shall provide a separate radiation survey for their personnel. The contractor shall be informed of Marine Corps survey findings, location of RAM and radiation areas, and local controls used. However, the contracting officer or ROICC shall also inform the contractor that they (the contractor) retain legal obligation for the safety of contractor personnel.

3. The contractor will provide the IRSO with an inventory of all radioactive sources and commodities that will be brought aboard the Air Station. The inventory will contain:

a. Complete nomenclature of each source.

b. Serial number of each source.

c. Isotope.

d. Activity in curies.

e. Location.

f. Date of the inventory.

g. Contractor's NRC license number, name and signature of the individual performing the inventory.

1005. THE NUCLEAR REGULATORY COMMISSION (NRC)

1. The NRC has the primary responsibility for regulating RAM. It grants permission to receive, possess, distribute, use, transport, transfer and dispose of RAM under special conditions established in individual licenses.

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2. The NRC has issued a Master Materials License to DoN, to control the receipt, acquisition, possession, use and transfer of NRC licensed RAM. The Navy Radiation Safety Committee (NRSC) was established to oversee the NRMP Program and to control the use of licensed material. The NRSC issues NRMP's to individual commands that have the authorization to use NRC regulated material as well as naturally occurring and accelerator produced materials.

3. All conditions and requirements contained in permits and licenses issued must be met by commands possessing, storing, using, and disposing of RAM and using machines that produce ionizing radiation.

1006. GENERAL REQUIREMENTS

1. Each unit must maintain an up-to-date inventory of RAM located in their work area. The inventory will include:

- a. Item nomenclature.
- b. NSN.
- c. Radioactive source ID number.
- d. Radioisotope.
- e. Chemical and physical form.
- f. Activity (in curies) and date determined.
- g. Location.
- h. Custodian's name.

2. Each operation involving RAM must have an SOP specifically tailored for the operation being conducted. As a minimum, the SOP will include:

- a. The purpose and objective of the SOP.
- b. Applicability.
- c. Responsibilities.
- d. Procurement.

- e. Storage.
- f. Inventory.
- g. Surveillance.
- h. References.
- i. Safety procedures (including specifics for use and handling). The SOP will include:
  - (1) Specifics of the purpose
  - (2) Philosophy.
  - (3) Safety rules.
  - (4) Instruction to personnel.
  - (5) Radiation protection standards.
  - (6) Surveys.
  - (7) Caution signs.
  - (8) Labels and signals.
  - (9) Radiological procedures and reporting.

3. RAM, including radioactive commodities, requires special storage procedures. At a minimum, all storage areas containing RAM and the entrances to these areas shall be labeled with signs containing the radiation symbol and the words "Caution - Radioactive Material". Areas used for storage of RAM will be kept to a minimum to facilitate adequate control. Small radioactive sources containing more than one millicurie of activity shall be stored in locked areas or cabinets, access to which is limited to authorized individuals. All losses of control of RAM will be reported to the supervisor, CRSO, and IRSO as soon as they are noted. This includes temporary misplacement, loss, theft or unauthorized access.

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4. RAM will not be stored in the same warehouse section with flammables, explosives, photosensitive items, food products or other incompatible goods. Proper selection of a fire resistant storage area for RAM will minimize release of radioactivity to the environment in the event of a fire. Whenever feasible, RAM shall be stored so that they are protected from adverse weather or conditions which may deteriorate the packaging materials. Commodities that contain radioactive gases, tritium containing devices, or radium shall be stored in ventilated structures. Smoking, eating, drinking, chewing, and contact lens application or removal will not be permitted in RAM storage areas.
5. A current list of locations where RAM is stored shall be available to personnel who might be called to fight a fire in such areas. This list should identify any unusual problems that might be encountered.
6. Reasonable care shall be taken in packaging and storing contaminated items to prevent the spread of contamination and to ensure that entry to areas where such storage is permitted does not result in the contamination of personnel or other areas. Personnel in potentially contaminated storage areas shall wear necessary anti-contamination clothing.
7. A radiation emergency can occur where RAM or radiation-producing equipment is used, stored or transported. Emergency plans are included in the NRMP application. Emergency plans include:
  - a. Procedures to identify conditions constituting an emergency.
  - b. A list by priority of individuals and departments to be notified.
  - c. Steps to control radiological exposure; and actions to be taken including official notification required.
8. Emergency plans shall be reviewed and updated annually. An exercise of the emergency plan shall be conducted annually under realistic conditions.

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9. Title 10 CFR 19.11, "Posting of notices to workers", requires that each licensee shall post current copies of the regulations contained in part 19 and 20, operating procedures applicable to licensed activities, any notice of violation involving radiological working conditions, proposed imposition of civil penalty, or other actions by the NRC. If posting of a document is not practicable, a notice may be posted which describes the document and states where it may be examined. (Appendix A).

10. NRC Form 2, "Notice of Employees", must be posted in all areas where RAM is used or stored. The required form can be ordered from the NRC.

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CHAPTER 2

RADIATION SAFETY TRAINING REQUIREMENTS

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2000. PURPOSE

1. The development of worker awareness of RSP permits the performance of tasks with greater efficiency and confidence.
2. When individuals are aware that there is some risk associated with their exposure, they can become active participants in the decision to accept and, where possible, reduce the risk as part of their job.
3. The number and seriousness of accidents and incidents can be reduced through training.

2001. MEDICAL REQUIREMENTS

1. Per NAVMEDP-5505, all personnel who are being considered for routine assignments to duties or occupations, which require exposure to ionizing radiation, shall be given a medical examination prior to assignment or transfer to those duties.
2. Personnel who are not routinely exposed to ionizing radiation as a result of their normal duties or occupation are not likely to exceed 0.5 rem (Roentgen Equivalent Man, a unit used to measure radiation exposure) per year are not required to have pre-placement medical examinations.
3. Pre-placement and subsequent medical examinations shall be provided to all x-ray and gamma radiographers and radiographers' assistants.
4. All personnel whose duties may require entry into a high radiation area (100 mrem (milli-rem, a unit indicating 1/1000) or higher in 1 hour).
5. All personnel required by conditions of individual NRMP's.
6. All personnel who routinely work with unsealed radium sources containing greater than 0.1 microcuries of radium or with unsealed sources of RAM greater than the exempt quantity limits specified in Schedule B of 10 CFR 30.



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6. All personnel deemed necessary by the Commanding Officer.

2002. RESPONSIBILITY. All Commanding Officers have the responsibility to ensure that occupationally exposed personnel under their jurisdiction maintain exposure to ionizing radiation ALARA. A part of ALARA is the assurance that each person has received radiation safety training commensurate with his or her potential for occupational exposure to ionizing radiation. **All training shall be documented by the RSO.**

2003. TRAINING REQUIREMENTS

1. Prior to assuming the duties of RSO or ARSO, the prospective appointee shall successfully complete initial qualification training at NAVSEADET RASO or have equivalent training and experience. Equivalent training and experience will be evaluated on a case-by-case basis by the NRSC prior to appointment. Courses offered and required by RASO can be found in NAVSEA Technical Manual S0410-00-RAD-010, Section II.

2. Each military gamma radiographer and radiographers' assistant shall successfully complete the Radiographic Operator Course (A-701-0032) at Service Schools Command, San Diego.

3. Civilian radiographers shall successfully complete the radiation safety training specified in their individual application for a NRMP to conduct gamma radiography.

4. All gamma radiographers will receive formal training on local command operating and emergency procedures and annual refresher training in radiation safety procedures and regulations specified and described in their individual application for a NRMP to conduct gamma radiography.

5. Initial training for x-ray radiographers shall consist of the successful completion of one of the courses specified in NAVSEA Technical Manual S0410-00-RAD-010, section 2.2.3.

6. Annual refresher training including the topics listed in NAVSEA Technical Manual S0410-00-RAD-010, shall be provided by the command.

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7. Completion of refresher training shall be documented by the student's attaining a score of 70 percent or better on a written examination.
8. Additional training shall be conducted each time there is a substantial change in equipment or operating procedures.
9. The RSO, his designated representative, or both shall conduct periodic training.
10. Radiography radiation barrier monitors shall receive initial training consisting of the topics listed in NAVSEA Technical Manual S0410-00-RAD-010, section 2.2.4. A score of 70 percent or better on a written examination is required for documentation of successful completion of initial training. The RSO or a designated representative shall conduct annual refresher training.
11. Radiation worker are personnel who are occupationally exposed to ionizing radiation. They work in controlled areas and are required to have a physical examination. Initial training for radiation workers consists of a minimum of:
  - a. Eight hours covering the subjects in NAVSEA Technical Manual S0410-00-RAD-010 with a final written examination score of 70 percent or better.
  - b. Annual refresher training will be conducted consisting of topics listed in NAVSEA Technical Manual S0410-00-RAD-010, section 2.2.5 and consist of a minimum of 4 hours duration.
  - c. The RSO or a Designated representative will conduct training.
12. Limited radiation workers are personnel who are not exposed to ionizing on a routine basis and who do not require a physical examination. Their sporadic exposure is monitored. Each limited radiation worker will receive initial and annual refresher training on the topics listed in NAVSEA Technical Manual S0410-00-RAD-010, section 2.2.6. Training will be conducted by the RSO or designated representative. The RSO will determine the duration.

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13. Prior to being issued dosimetry equipment, all personnel authorized to receive radiation exposure shall be given specific instruction about prenatal exposure risks to the developing embryo and fetus. All reasonable efforts shall be made to keep ionizing radiation exposure to the unborn child to the very lowest practical level. The radiation exposure control level for personnel physically capable of bearing children shall not be extended beyond 0.15 rem per year unless required instruction has been repeated and the statement in Appendix A of NAVSEA Technical Manual S0410-00-RAD-010 has been signed. These statements will be kept in the individual's training record and a copy provided to the IRSO. Statements signed by visitors will be retained for 3 years. Instruction concerning prenatal exposure to the unborn child shall also be given to personnel who supervise female workers authorized as above, because they affect the amount of radiation exposure a female worker receives. Instruction concerning prenatal exposure to the unborn child shall be given by the IRSO or designated representative during initial and annual training. The U.S. NRC Regulatory Guide 8.13 shall be available and a copy given to individuals receiving the training. No examinations are given but training shall be documented.

14. All emergency response personnel who could be exposed to ionizing radiation during the performance of their duties shall receive initial and periodic training. Training will include:

- a. Information on sources of radiation in areas where they may be required to respond.
- b. Potential hazards associated with those sources.
- c. The relative priority of radiological controls versus other safety considerations during an emergency.
- d. Procedures to avoid or reduce potential radioactive contamination in emergency response situations.
- e. Personal radiation safety requirements for personnel entering radiation areas under emergency conditions.

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- f. Familiarization with the physical layout of facilities.
  - g. Personnel to contact to provide radiological controls support during or after an emergency.
  - h. Initial training shall be a minimum duration of 2 hours.
  - i. Periodic training shall be given annually covering the scope of the initial training and additional training will be provided whenever there is a significant increase in radiation exposure potential.
  - j. The IRSO or a designated representative shall conduct training.
15. Other organization personnel who routinely work in or frequent areas adjacent to radiation areas and RAM storage areas shall receive training including:
- a. Need to heed radiation warning signs and boundary markers.
  - b. Nature of potential radiation exposures (including those from natural background radiation and medical exposures).
  - c. Controls used to protect them from radiation exposure.
  - d. The IRSO or a designated representative will give initial and periodic training.

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CHAPTER 3

TRANSPORATION OF RADIOACTIVE MATERIALS

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## CHAPTER 3

### TRANSPORTATION OF RADIOACTIVE MATERIAL

3000. GENERAL. Transportation of RAM is generally considered to be very complicated because it is regulated by more than one agency and the requirements are contained in more than one section of each agency's regulations. Transportation of RAM must comply with military, NRC, and DOT regulations. Personnel assigned to duties related to transportation of RAM must be appropriately trained according to Title 49 of the Code of Federal Regulations. **Do not transfer radioactive commodities or RAM to Defense Reutilization and Marketing Offices (DRMO),** but retain until shipping instructions are received from the Inventory Control Point. The shipper of record is ultimately responsible for compliance.

#### 3001. CLASSIFICATION

1. First determine if the material is subject to the regulations.
2. Determine the specific regulations that are applicable by determining the form and quantity of the material and determine the type of packaging required.

#### 3002. PACKAGING

1. Type A. Designed to retain the integrity of containment and shielding under normal conditions of transport and it is certified by the shipper as meeting the requirements of transportation.
2. Type B. Designed to retain the integrity of containment and shielding when subjected to the normal conditions of transport and hypothetical accident test conditions. It is used for quantities of radioactivity greater than permitted in Type A packaging.

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3. Packaging must be easily handled and properly secured in or on a conveyance during transport and must have design features which allow for safe manual or mechanical handling while not posing undue stress on the package.
4. The external surface may be easily decontaminated and free from protruding features or places where water might collect with no feature added to the package at the time of transport that will reduce the safety of the package.
5. The materials of construction of the packaging and any components will be physically and chemically compatible with each other and the package contents.
6. All valves through which the package contents could escape will be protected against unauthorized operation.
7. All special requirements for shipment by air must be met if that mode of transportation is used.

### 3003. LABELING

1. Unless otherwise accepted from labeling, each package of RAM must be labeled as required by DOT regulations.
2. The proper label is based on the radiation level at the surface of the package, the transport index, and, if appropriate, the fissile characteristics of the package. The label to be applied shall be the highest category required for any of the three conditions.

### 3004. SHIPPING PAPERS

1. DOT, International Civil Aviation Organization Technical Instructions (ICAO TI), and International Air Transport Association Dangerous Goods Regulations (IATA) all require the use of a "shipping paper" with specific information for hazardous materials. Each agency requires very specific information that must be included on the form. The RAM Movement Form (Appendix A) will be used in addition to any other required documents.

2. Unless otherwise accepted, a shipper's certification statement shall certify that the material is offered for transportation per regulations.
3. Shipping papers, including emergency response information, must be easily recognizable by authorities and immediately available in the event of accident or inspection.
4. A record of each transfer of RAM (Appendix A) shall be maintained for at least 3 years and shall contain verification that the receiving activity is licensed or authorized by NRMP to receive the RAM. The record will also contain the following documentation:
  - a. Identity of the RAM.
  - b. Copy of the bill of lading or manifest for the shipment.
  - c. Copy of the acknowledgement of receipt of the material.
  - d. For sealed sources, a copy of the current leak test certificate.

3005. PLACARDING

1. The person who offers RAM for transport by motor vehicle must provide the appropriate placard to the transporter unless the vehicle is already placarded appropriately.
2. Each motor vehicle used to transport a package of Highway Route Controlled quantity RAM must have the required "RADIOACTIVE" warning placard placed on a square background.

3006. CARRIAGE

1. RAM may not be transported in a private motor vehicle.
2. Only RAM used for medical or research purposes with a transport index less than 3.0 may be shipped in a passenger plane's cargo hold. Special provisions apply. RAM shipped by cargo plane must display a "Cargo Only" label.



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3. Transport by motor vehicle must comply with all applicable regulations. The NRC requires that all RAM must be transported according to DOT regulations even when the material or item is not "in commerce". While being transported within the confines of the Air Station, DOT regulations apply.

3007. RECEIPT

1. Arrangements to receive a package containing RAM must be made when the carrier offers it for delivery or when notified of the arrival of the package at the carrier's terminal.

2. Packages known to contain RAM must be monitored for radioactive contamination and radiation levels not later than 3 hours after receipt:

a. When the package is labeled as containing RAM.

b. The package has evidence of potential contamination, such as packages that are wet, crushed, or damaged.

3. If the external radiation levels exceed 200 mrem per hour at the surface, 10 mrem per hour at 1 meter from the surface, or 2 mrem per hour in any occupied position of the vehicle, the receiver will immediately notify the IRSO.

4. The receiving unit shall maintain the survey records.

CHAPTER 4

DISPOSAL OF RADIOACTIVE MATERIAL

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## CHAPTER 4

### DISPOSAL OF RADIOACTIVE MATERIAL

#### 4000. DEFINITION

1. Low Level Radioactive Waste (LLRW) includes:

a. Surplus, unwanted or unserviceable devices that are identifiable as containing RAM.

b. Commodities that is identifiable as containing RAM.

c. Instruments or articles that is identifiable as containing RAM.

2. It also includes RAM for which there is no longer a useful purpose or property contaminated with RAM to the extent that decontamination is economically unfeasible. The item manager will advise users if the item may be turned in for reconditioning rather than disposal.

#### 4001. TURN IN PROCEDURES

1. LLRW cannot be disposed of as ordinary waste or hazardous waste. It may not be turned in to DRMO.

2. An inventory of LLRW for transfer and disposal must be forwarded to the IRSO or CRSO as soon as the waste is identified utilizing (Appendix B).

3. The user will provide a copy of the turn in document to the user's supply facility when the LLRW is moved to the waste storage site.

#### 4002. INSTALLATION RADIATION SAFETY OFFICER (IRSO)/COMMAND RADIATION SAFETY OFFICER RESPONSIBILITIES (CRSO)

1. The IRSO or CRSO receiving the LLRW will notify the RASO and arrange for the waste to be picked up.

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2. The CRSO or IRSO will arrange for the LLRW to be moved to the LLRW storage site where it will be held secured until it is picked up.

3. When the waste is picked up for disposal, the IRSO/CRSO will provide copies of the documentation to the unit that turned in the LLRW and the supply facility.

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CHAPTER 5

GENERAL EMERGENCY GUIDELINES

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## CHAPTER 5

### GENERAL EMERGENCY GUIDELINES

#### 5000. INTRODUCTION

1. Each unit handling, storing, using, transporting, receiving or disposing of sources of ionizing radiation, RAM or commodities containing RAM shall have a specific SOP as outlined in Chapter 1 and training as described in Chapter 2.
2. The emergency guidelines in this chapter are general in nature. These guidelines will be used when an incident involving breakage, other exposures to RAM, or radioactivity produced from any source is discovered by personnel whose positions are not covered by a radiation SOP.

#### 5001. EMERGENCY GUIDELINES

1. In the case of an incident involving RAM, the senior person present shall take immediate steps to control the emergency and request assistance from the CRSO, the IRSO and other personnel as required.
2. The initial objective of any accident response involving RAM is to regain control over the event and prevent further spread of any radioactive contamination produced.
3. Actions to save life, aid the injured, fight fires, or control further spread of damage take precedence over concerns for radiological contamination that may arise from fielded Marine Corps equipment.

#### 5002. GENERAL STEPS

1. In order to minimize personnel exposure from possible internal contamination, notify personnel in the immediate area to move away. Sound the alarm.
2. In the case of tritium gas, vacate the immediate area and remain upwind for at least 30 minutes or until directed by the CRSO/IRSO to reenter. If in a building, open doors and windows or operate fans to increase ventilation.

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3. In case of fire, stay away from the downwind smoke. Move upwind, a minimum of 100 meters, or further, as directed by the CRSO/IRSO. The self-contained breathing apparatus worn by firefighters will provide short-term protection against inhalation of airborne radioactive contamination.

4. As soon as possible, notify the IRSO to ensure proper follow-up actions.

#### 5003. CONTAMINATION CONTROL

1. Devices with broken sources and any resulting debris should only be handled while wearing rubber or plastic gloves.

2. Devices with broken sources and any resulting debris should be doubly wrapped by inserting them into two plastic bags and sealing each (inner and outer bag) with tape. Clearly label the package as containing a radioactive contamination device or materials. Retain all broken or non-illuminative devices for disposal as radioactive waste.

3. Personnel who may have received contamination on bare skin should wash with a mild soap and plenty tepid water. Care should be taken not to irritate or abrade skin. NAVMEDCOM Instruction 6470.10, available at Navy medical commands. Offers useful technical guidance for handling radioactivity contaminated personnel and monitoring procedures for various radioisotopes. All personnel suspected of exposure to radiation should be evaluated by a health professional

4. Contamination of the immediate area or on the major end item should be considered a possibility based on the circumstances of the incident and on radiological measurements. Potentially contaminated areas are not to be open for normal access or potentially contaminated equipment returned to service until determination by the IRSO that radioactive contamination did not occur or reductions of contamination levels have been reduced to below the allowable limits.

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CHAPTER 6

RADIOACTIVE MATERIAL MOVEMENT FORM

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## CHAPTER 6

### RADIOACTIVE MATERIAL MOVEMENT FORM

6000. PURPOSE. The RAM Movement Form (Appendix C) is used to maintain an accurate record of the change of location or custody of RAM, sources, commodities, or items containing RAM. This form should be completed in addition to any other required documents, whenever transfers or changes of custody of items involving ionizing radiation take place. The unit transferring the item should retain one copy, one copy should be given to the receiving unit, one copy should be given to the appropriate supply activity, and one copy should be sent to the IRSO.

#### 6001. LEAK TESTS

1. Certain radioactive commodities require periodic leak testing to verify the integrity of the radioactive source as a condition of the governing NRC license or NRMP.
2. Generally, such commodities do not require leak tests while remaining in storage but require leak testing, or a current leak test document, before use or shipment to a using activity.
3. User activities retain responsibility for ensuring fielded items have current leak tests. Any items failing the leak test should immediately be removed from services.

#### 6002. DISPOSITION

1. Disposition instructions should be requested from the Integrated Logistics Support Directorate (ILSD), Albany, before any movement of RAM. The request for instructions for disposition of excess, defective or serviceable radioactive items may be made by message or letter. Provide the ILSD with the quantity, NSN, serial number, condition codes, applicable NRC license or NRMP numbers, and any other identifying or amplifying information. State in the remarks section if the item contains "Tritium Sources" or "Radioactive Materials".

2. The ILSD will provide detailed disposition instructions for repairable items per current maintenance agreements and non-repairable items.

3. Information copies of disposition instructions should be sent to the Logistics Radiation Safety Officer (LRSO), and appropriate RSO's at MCLB Albany, who will initiate tracer actions on shipments not received within 120 days. Copies of disposition instructions for local transfers should be sent to the IRSO, MCAS Beaufort.

6003. SHIPPING

1. Consult DOT regulations before any shipment of RAM to ensure compliance with current regulations. The shipper of record is ultimately responsible for compliance with DOT regulations for shipment of hazardous materials.

2. Ship intact Marine Corps radioactive commodities, unless otherwise specified, using the Proper Shipping name "Radioactive Material, Excepted Package-Instruments or Articles" under the provisions of DOT regulations in Title 49 CFR 173.422. Items under the cognizance of other services or commercial activities may require the use of other shipping names or procedures.

3. Package shipments of each radioactive commodity according to individual packaging data sheets (PDS) or special packaging instruction (SPI) or with the requirements of 49 CFR if the PDS/SPI do not meet these requirements.

APPENDIX A

OFFICIAL RADIATION SAFETY NOTICE

Title 10 Code of Federal Regulations

Summary: Part 20 Standards for Protection Against Radiation

- Subpart A    General Provisions: The regulations in this part establish standards for protection against ionizing radiation resulting from activities conducted under licenses issued by the Nuclear Regulatory Commission. The Regulations in the following subparts control the receipt, possession, use, transfer, and disposal of licensed material by any licensee in such a manner that the total dose to an individual (including doses resulting from licensed and unlicensed radioactive material and from radioactive sources (other than background radiation)), does not exceed the standards for protection against radiation prescribed in the regulation in this part.
- Subpart B    Radiation Protection Programs
- Subpart C    Occupation Dose Limits
- Subpart D    Radiation Dose Limits for Individual Members of the Public
- Subpart E    Radiological Criteria for License Termination
- Subpart F    Surveys and Monitoring
- Subpart G    Control of Exposure from External Sources in Restricted Areas
- Subpart H    Respiratory Protection and Controls to Restrict Internal Exposure in Restricted Areas
- Subpart I    Storage and Control of Licensed Material

APPENDIX A

OFFICIAL RADIATION SAFETY NOTICE

Title 10 Code of Federal Regulations (Cont.)

- Subpart J     Precautionary Procedures
- Subpart K     Waste Disposal
- Subpart L     Records
- Subpart M     Reports
- Subpart N     Exemptions and Additional Requirements
- Subpart O     Enforcement
  
- Appendix A    Protection Factors for Respirators
  
- Appendix B    Annual Limits on Intake (ALI's) and Derived Air Concentrations (DAC's) of Radionuclides for Occupation Exposure; Effluent Concentrations; Concentrations for Release to Sewerage
  
- Appendix C    Quantities of Licensed Material Requiring Labeling
  
- Appendix D    United States Nuclear Regulatory Commission Regional Offices
  
- Appendix E    (Reserved)
  
- Appendix F    Requirements for Low Level Radioactive Waste Transfer for Disposal at Land Disposal Facilities and Manifests
  
- Appendix G    Requirements for Transfers of Low Level Radioactive Waste Intended for Disposal At Licensed Land Disposal Facilities and Manifests

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Title 10 Code of Federal Regulations

Summary: Part 21 Standards for Protection Against Radiation

The Regulations in this part (see Summary line) establish procedures and requirements for implementation of section 206 of the Energy Reorganization Act of 1974. That section requires any individual director or responsible officer of a firm constructing, owning, operating or supplying the components of any facility or activity which is licensed or otherwise regulated pursuant to the Atomic Energy Act of 1954, as amended, or the Energy Reorganization Act of 1974, by who obtains information reasonably indicating:

1. That the facility, activity or basic component supplied to such facility or activity fails to comply with the Atomic Energy Act of 1954, as amended, or any applicable rule, regulation, order, or license of the Commission relating to substantial safety hazards or
2. That the facility, activity, or basic component supplied to such facility or activity contains defects, which could create a substantial safety hazard, to immediately notify the Commission of such failure to comply or such defect, unless he has actual knowledge that the Commission has be adequately informed of such defect or failure to comply.

Title 10 Code of Federal Regulations

Pursuant to NAVSUPINST 3400.5C, paragraph 4.e states in part:

If posting of a document specified above is not practicable, the activity may post a notice that describes the document and states where it may be examined. The documents may be examined at the MCAS, Beaufort IRSO's office in the Department of Safety and Standardization. The information may also be viewed at the website:

<http://www.nrc.gov>

Summary:

Part 19, Notice, Instructions and Reports to Workers:  
Inspections and Investigations

The regulations in this part establish requirements for notices, instructions, and reports by licensees to individuals participating in licensed activities and options available to the individuals in connection with the NRC inspections of licensees to ascertain compliance with the provisions of the Atomic Energy Act of 1954, as amended, Title II of the Energy Reorganization Act of 1974, and regulations, order, and licenses there under regarding radiological working conditions. The regulations in this part apply to all persons who receive, possess, use, or transfer material licensed by the NRC pursuant to the regulation in parts 20 through 36, 39, 40, 60, 61, 70 or part 72 of this chapter. The regulations regarding interviews of individuals under subpoena apply to all investigations and inspections with the jurisdiction of the NRC other than those involving NRC employees or NRC contractors. The regulations in this part do not apply to subpoenas issued pursuant to 10 CFR 2.720.

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APPENDIX B

LOW LEVEL RADIOACTIVE MATERIALS TRANSFER AND DISPOSAL DOCUMENT

Date: \_\_\_\_\_

Memorandum for the Record

From:

To:

Subj:

Ref: (a) ASO 5104.1

1. The following material is submitted for transfer and disposal per reference (a):

- a. Item count:
- b. Item Description:
- c. Part Number(s)
- d. Serial Number(s)
- e. NSN/NIIN:

3. Remarks:

(Attach numbered [\_of\_] additional pages as necessary)

Submitted By:

Unit Radiation Protection POC:

Phone:

Signature:

Date:

Received By:

IRSO/CRSO Signature:

Date:

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Instructions for Compliance of  
LLRM Transfer and Disposal Document

Although the form appears to be self-explanatory, the following instructions shall be used in completing the form:

1. The "From" line shall contain the unit title, command and location.
2. The "Item Count" is the number of units of the item being turned in.
3. The "Item Description" includes the Nomenclature, Part Number, and Serial Number(s). The description and part number are identified in the appropriate aircraft maintenance manual.
4. The NSN/NIIN can be provided by Supply manuals or data based.
5. The "Radioactive Source" is the name of the radioactive material i.e. Tritium (H#), Cobalt 60, Strontium 90, etc.
6. State in the remarks section if the sources are broken or radioactive contamination is known or suspected.
7. The printed name, phone number, and signature or the person responsible for the unit's RAM and the date the document was submitted should be placed in the "Submitted by" section.
8. The IRSO will sign and date the document when it is received and then contact RASO and the person who submitted the document to make arrangements for disposition of the material.



APPENDIX C

**MARINE CORPS AIR STATION BEAUFORT  
RADIOACTIVE MATERIAL (RAM) MOVEMENT FORM**

19. MOVEMENT TYPE (CHECK ONE): <input type="checkbox"/> SHIPMENT/ TRANSFER <input type="checkbox"/> RECEIPT				2. DOCUMENT NUMBER: USMC-			
3. CONSIGNOR (Originating Unit):				4. CONSIGNEE (Intended Recipient):			
5. COMMODITY DESCRIPTION							
Qty	NSN	Nomenclature	Serial No.	Isotope	Activity	Total Activity	
6. MODE OF SHIPMENT		7. PHYSICAL CHARACTERISTICS			8. RADIATION SURVEY RESULTS (If required)		
<input type="checkbox"/> Air <input type="checkbox"/> Truck <input type="checkbox"/> Rail <input type="checkbox"/> Water <input type="checkbox"/> Parcel Post <input type="checkbox"/> Other		<input type="checkbox"/> Special Form <input type="checkbox"/> Solid <input type="checkbox"/> Normal Form <input type="checkbox"/> Liquid <input type="checkbox"/> Gas			Instrument Used: _____ Calibration Due: _____ SN: _____ Transport Index: _____ Surface: _____ mrad/hr    _____ µGy/hr One Meter: _____ mrad/hr    _____ µGy/hr Background: _____ mrad/hr    _____ µGy/hr		
9. PRE-SHIPMENT WIPE TEST/ILLUMINATION TEST RESULTS							
Wipe/Inspection Performed by: _____		Wipe Counted by: _____		Result: _____ SAT    _____ UNSAT			
Date: _____		Date: _____		Removable: _____ dpm/100 cm <sup>2</sup>			
				MDA: _____ µCi    _____ Bq			
10. RECEIPT INSPECTION RESULTS							
Inspection Results: _____ SAT    _____ UNSAT				Receipt Inspection: Performed by: _____			
NOTE: If UNSAT, Wipe test shall be performed and results entered in Block 9 above.				Date: _____			
11. BASIC DESCRIPTION							
<input type="checkbox"/> Radioactive Material, Excepted Package: Instruments & Articles, 7, UN 2910			<input type="checkbox"/> Radioactive Material, Special Form, n. o. s. , 7, UN 2974				
<input type="checkbox"/> Radioactive Material, Excepted Package: Limited Quantity of Material, 7, UN2910			<input type="checkbox"/> Radioactive Material, Low Specific Activity LSA, n. o. s. , 7, UN 2912				
<input type="checkbox"/> Radioactive Material, Excepted Package: Articles Manufactured from Natural or Depleted Uranium or Thorium, 7, UN 2910			<input type="checkbox"/> Radioactive Material, Fissile, n. o. s. , 7, UN 2918				
<input type="checkbox"/> Radioactive Material, Excepted Package: Empty Packaging, 7, UN 2910							
12. Labeling		19. Marking			19. Shipping Papers		
<input type="checkbox"/> White I <input type="checkbox"/> Yellow II <input type="checkbox"/> Yellow III <input type="checkbox"/> Exempt		<input type="checkbox"/> Radioactive <input type="checkbox"/> Exempt <input type="checkbox"/> Radioactive LSA <input type="checkbox"/> Waste Class A, B, C <input type="checkbox"/> Other ( _____ )			<input type="checkbox"/> Included & Complete <input type="checkbox"/> Exempt		
15. CERTIFICATION:							
16. INCIDENT/ACCIDENT NOTIFICATION: 24 HOUR EMERGENCY RESPONSE PHONE NUMBER:  POC: COMMENTS:							
17. Printed Name of Certifying Official:			18. Signature:		19. Date:		

**Instructions for completing the USMC RAM Movement Form (Form is complete<sup>a</sup> by the originating unit):**

- Block 1. This is the evolution for which the form is being generated. Only one of these options should be selected.
- Block 2. This is a unique tracking number and is locally generated by the command initiating the movement.  
Suggested format: USMC-M67004-01-001  
This format identifies the agency, the Unit AAC, the year, and the movement number. The year rolls forward on January 1st, the movement number resets to 001.
- Block 3. This block contains the name and address and of the unit that is offering the item for shipment or transfer. (This unit will show a decrease in their RAM inventory as a result of the transaction.)
- Block 4. This block contains the name and address of the location intended to be the final destination of the item being shipped or transferred. (This unit will show an increase in their RAM inventory as a result of the transaction.)
- Block 5. This is specific information related to the device being shipped or transferred. All blocks are to be completed as accurately as possible.
- Block 6. The specific mode of transport should be checked.
- Block 7. This information can typically be found in equipment technical manuals. **To determine specific characteristics, a good rule of thumb is that devices containing H-3 will usually be Normal Form, Gas; devices containing Ni-63 are Normal Form, Solid; and devices containing Am-241 are Special Form, Solid.**
- Block 8. Radiation surveys generally do not apply for USMC devices. For guidance concerning the necessity of acquiring radiation survey data, contact the USMC Radiological Controls Office at DSN 567-5511.
- Block 9/10. Completion of these blocks is mandatory. See guidance for conducting pre-shipment and receipt inspections as provided on the Radiological Controls website at <http://www.ala.usmc.mil/radcon/>. Complete only the blocks for the type inspection performed, blocks not used should be left blank.
- Block 11. This is a general description of the device and is the basis for claiming applicable exemptions from marking and labeling of the shipping package. Almost all USMC packages fall into the first category. **Radioactive Material, Excepted Package – Instruments and Articles, 7, UN 2910.**
- Block 12. Marked as “Exempt” unless otherwise directed by the local Transportation Officer or the RCO.
- Block 13. Marked as “Exempt” unless otherwise directed by the local Transportation Officer or the RCO.
- Block 14. Marked as “Exempt” for on-site transfers. For off-site transfers requiring a shipping manifest and bill of lading, contact the local Transportation Officer for guidance and ensure the “Included & Complete” option is checked.
- Block 15. If package certification is based on selecting “Instruments and Articles” as described in the Block 11 instructions above, this statement should read: **“THIS PACKAGE CONFORMS TO THE CONDITIONS AND LIMITATIONS SPECIFIED IN 49 CFR 173.424 FOR RADIOACTIVE MATERIALS, EXCEPTED PACKAGE - INSTRUMENTS OR ARTICLES, UN2910”**. If a package is shipped under a different basic description, the certifying statement must be changed in accordance with 49 CFR 173.422(a).
- Block 16. This information must be provided. It should include a local POC and contact phone number as a minimum. The RCO should be identified in the comments section as an alternative POC in the event the originating CRSO/IRSO cannot be reached.
- Block 17. The printed name of the individual certifying the information on the form is correct and appropriate disposition/authorization to ship or transfer the device has been obtained.
- Block 18. The signature of the individual certifying the information on the form is correct and appropriate disposition/authorization to ship or transfer the device has been obtained.
- Block 19. The date Block 18 is signed.