	OFFICE OF MARINE AND AVIATION OPERATIONS	PROCEDURE 0701-10	VERSION 1.0
		EFFECTIVE DATE March 27, 2012	
	AUTHORIZED BY: RDML Michael S. Devany, NOAA Director, Marine and Aviation Operations Centers	REVIEW DATE March 27, 2015	
		RESPONSIBLE POSITION MOC Operations Branch	

RADIOACTIVE MATERIAL ABOARD NOAA SHIPS

1. PURPOSE

1.1 This procedure provides guidance to ensure compliance with all international, federal, state, and local environmental, health, and safety statutes, regulations, and best management practices regarding the possession, handling, disposition, and use of radioactive material (RAM) aboard National Oceanic and Atmospheric Administration (NOAA) ships.

2. SCOPE

2.1 This procedure applies to all ships in the NOAA fleet.

3. RESPONSIBILITIES AND PROCEDURES

3.1 Responsibilities

3.1.1 The Director of the NOAA line office laboratory, scientific institution, or organization requesting authorization to use RAM aboard a NOAA ship shall:

A. Submit the documents listed below to the Marine Operations Center Commanding Officer (MOC-CO) at least three (3) months in advance of a domestic project start date and at least eight (8) months in advance of a foreign project start date, for each radioisotope to be brought aboard the ship.

1. NOAA Form (NF) 57-07-02, Request to use Radioactive Material Aboard a NOAA Ship.
2. Draft Project Instructions (only one copy required per project).
3. Nuclear Regulatory Commission (NRC) Materials License (NRC Form 374) or a state license for each state the ship will operate in with RAM on board the ship.
4. Report of Proposed Activities in Non-Agreement States, Areas of Exclusive Federal Jurisdiction, or Offshore Waters (NRC Form 241), if only state license(s) are submitted.
5. Material Safety Data Sheet (MSDS).
6. Experiment or usage protocols, including spill clean-up procedures.

B. If applicable, submit a waiver request to use radioisotopes in a permanent interior shipboard space in lieu of a portable laboratory van on deck with the documents required above to the Director, Office of Marine and Aviation Operations (OMAO), through the MOC-CO in compliance OMAO Policy 1702.

C. Include RAM information in the Cruise Prospectus in advance of the draft Project Instructions to facilitate requests for marine scientific research clearances during voyages in foreign waters.

D. Identify in writing the Radiation Safety Officer (RSO), Authorized User (AU) and all other radiation workers authorized to work with radioisotopes.

E. Ensure clear written arrangements are in place for the lawful removal, transport, and disposal of all RAM and radioactive waste, including those instances where project completion is expected to occur in a foreign port.

3.1.2 The RSO shall:

A. Ensure the radiation protection program addresses RAM activities aboard the ship, which includes clean-up procedures in the event of a spill or positive wipe test.

B. Ensure experiment and usage protocols comply with all relevant aspects of the institutional radiation protection program.

C. Ensure the AU and radiation workers have proper training and experience to work with the RAM aboard the ship, and provide training documentation upon request.

3.1.3 The AU shall:

A. Ensure all activities associated with the use of RAM aboard the ship are in compliance with the NOAA Radiation Safety Manual, Chapter 27, Ionizing Radiation; NRC Materials License, and this procedure.

B. Maintain a NF 57-07-03, Radioactive Material Usage aboard a NOAA Ship, for each radioisotope brought aboard the ship.

C. Immediately contain and clean up any radioisotope spill. See Section 3.2.3.

3.1.4 The Chief Scientist shall:

A. Ensure each portable laboratory van is compatible with the shipboard power supply and other services.

B. Ensure the RAM laboratory is configured to prevent spills, leaks, or other radioactive contamination from entering the shipboard ventilation, potable water, and drainage systems.

C. Provide proper equipment such as signage, personal dosimeters, scintillation counters, swab test kits, and any additional personal protective equipment (PPE) required for the safe handling and use of RAM.

D. Ensure sufficient spill response supplies are aboard the ship to manage at least 150 percent of the volume of RAM on board.

E. Provide proper Hazard Communication training to all ancillary workers aboard the ship before any departure.

F. Submit completed NF 57-07-03 forms to the Commanding Officer / Master (CO) and MOC-CO within three (3) days after all RAM and radioactive waste have been removed from the ship.

3.1.5 The Director, OMAO shall:

A. Approve or reject each waiver request to use or store RAM in any ship interior space.

3.1.6 The MOC-CO shall:

A. Approve or reject each NF 57-07-02.

B. Reject any waiver request or forward the request to the Director, OMAO through the proper chain of command.

3.1.7 The CO shall:

A. Accept RAM aboard the ship only upon written authorization from the MOC-CO.

B. Before departure, ensure Hazard Communication training is provided to all ancillary workers aboard the ship by the Chief Scientist or their representative.

C. Maintain copies of each NF 57-07-02, NF 57-07-03, and associated application documents on board the ship for five (5) years after all RAM and radioactive waste have been removed from the ship.

3.1.8 MOC Operations Branch shall:

A. Coordinate and oversee the application and authorization processes to use RAM aboard NOAA ships.

B. Coordinate with the Chief Scientist regarding requests for foreign clearances and information pertaining to RAM aboard NOAA ships in foreign waters, including any obligations related to loading or off-loading RAM in foreign ports as applicable.

C. Serve as the point of contact for all requests made on behalf of the Chief Scientist to the U.S. Department of State.

3.2 Procedures

3.2.1 Storage and Use

A. RAM brought aboard and radioactive waste generated while aboard the ship shall be properly stored and used in a portable laboratory van outfitted for the purpose of radioisotope work. RAM may also be used during daylight hours on the weather deck in an area immediately adjacent to the portable laboratory van for samples that require exposure to direct sunlight. Radioactive samples in the weather deck usage area shall remain in a sealed container and be moved directly back into the portable laboratory van after use on the weather deck is complete.

B. The Director, OMAO may grant a waiver to permit the storage and use of RAM in an interior shipboard laboratory space aboard ships unable to accommodate a dedicated portable laboratory van. Waiver requests shall include detailed plans to minimize risks related to security, restricted access, exposure monitoring, environmental release, spill containment, spill clean-up, and personal safety of radiation workers and ancillary workers.

C. An AU representing the scientific field party shall remain on board the ship at all times from the time the RAM is initially brought aboard until all RAM and radioactive waste have been removed, unless the CO grants written permission to the AU to disembark and the following conditions apply:

1. All RAM and radioactive waste are packaged according to U.S. Department of Transportation regulations;
2. All RAM and radioactive waste are secured in the RAM laboratory away from ancillary workers;
3. CO is provided with 24-hour emergency contact information for the AU;
4. CO is provided with a key to the locked RAM laboratory;
5. CO is provided with a radiation detector and proper usage instructions;
6. Shipboard emergency responders are briefed on the storage location and proper use of radioactive spill response PPE and supplies; and
7. AU agrees to coordinate spill response, in accordance with NRC requirements, for all incidents involving RAM while the AU and radiation workers are not aboard the ship.

3.2.2 Wipe Tests

A. Wipe tests shall be performed on the ship by the AU before each departure from port, at least weekly during the voyage, after a suspected spill, and after arrival in port. If the cruise has multiple legs, only one wipe test is required during the in port period, unless the AU changes. In that case the outgoing AU shall complete a final wipe test and the incoming AU shall complete an initial wipe test during the in port period.

B. Wipe tests shall be performed around the weather deck usage area (if applicable) at least weekly during the voyage and upon the request of the CO.

C. Wipe test results shall be recorded on NF 57-07-03. Positive test results shall be immediately reported to the CO and clean-up procedures initiated for the contaminated surface area. Negative test results shall be recorded on the form indicated above.

3.2.3 Radioisotope Spills

A. AU shall immediately contain and clean up any radioisotope spill.

B. AU shall immediately notify the CO of any radioisotope spill.

C. AU shall report the radioisotope spill on the NF 57-17-137, Report of Work Related Illness, Injury or Incident.

3.2.4 Radiation Signage

A. Radiation warning signs or placards shall be conspicuously displayed on all exterior doors of the laboratory work area where the RAM will be used and stored before the RAM is brought onto the ship. Additional radiation warning signs shall be placed on the exterior door of the storage locker where the RAM will be stored.

B. A warning line system shall be erected to encompass the weather deck usage area (if applicable) whenever RAM is used in the area. Radiation warning signs or placards shall be conspicuously displayed on each side of the weather deck usage area.

C. Copies of the MSDS shall be conspicuously posted on the crew bulletin board and on the exterior door of the portable laboratory van in a waterproof plastic cover.

D. Eating and drinking is prohibited in any area bearing radiation signage.

E. Radiation warning signs or placards shall be removed after all RAM and radioactive waste have been removed from the ship.

3.2.5 Disposal

A. Disposal of RAM and radioactive waste at sea is prohibited. All RAM and radioactive waste shall be properly removed from the ship in port after the ship is moored.

B. All RAM and radioactive waste shall be removed from the ship as soon as practicable upon arrival in port at the completion of the project.

C. RAM shall not be retained onboard the ship without written authorization from the CO which indicates the amount and form of the radioisotope, and the date the RAM will be removed from the ship.

4. RECORDS AND REPORTS

Request to Use Radioactive Material aboard a NOAA Ship	NF 57-07-02
Radioactive Material Usage aboard a NOAA Ship	NF 57-07-03
Report of Proposed Activities in Non-Agreement States, Areas of Exclusive Federal Jurisdiction, or Offshore Waters	NRC Form 241
Materials License	NRC Form 374

5. REFERENCES

NRC Regulations, Title 10, Code of Federal Regulations
http://www.nrc.gov/reading-rm/doc-collections/cfr/

- 10 CFR §2 Rules of practice for domestic licensing proceedings and issuance of orders.
- 10 CFR §19 Notices, instructions and reports to workers: inspection and investigations.
- 10 CFR §20 Standards of protection against radiation.
- 10 CFR §20.1003 Definitions
- 10 CFR §20.1005 Units of radioactivity.
- 10 CFR §20.1101 Radiation protection programs.
- 10 CFR §21 Reporting of defects and noncompliance.
- 10 CFR §30 Rules of general applicability to domestic licensing of byproduct material.
- 10 CFR §30.3 Activities requiring license.
- 10 CFR §30.31 Types of licenses.
- 10 CFR §30.33 General requirements for issuance of specific licenses.
- 10 CFR §31 General domestic licenses for by product material.
- 10 CFR §32 Specific domestic licenses to manufacture or transfer certain items containing byproduct material.
- 10 CFR §51 Environmental protection regulations for domestic licensing and relate regulatory functions.
- 10 CFR §71 Packaging and transportation of radioactive material.
- 10 CFR §150.7 Persons in offshore water not exempt.
- 10 CFR §150.15 Persons not exempt.

Consolidated Guidance about Materials Licenses, NUREG-1556 Vol. 7
Program-Specific Guidance About Academic, Research and Development, and Other Licenses of Limited Scope Including Gas Chromatographs and X-Ray Fluorescence Analyzers

6. DEFINITIONS

ALARA The acronym for "as low as is reasonably achievable" which means making every reasonable effort to maintain exposures to radiation as far below the dose limits as is practical consistent with the purpose for which the licensed activity is undertaken, taking into account the state of technology, the economics of improvements in relation to state of technology, the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to utilization of nuclear energy and licensed materials in the public interest.

Ancillary Worker A person who is not authorized to work with radioactive material or equipment containing radioactive material, but has access to areas where radioisotopes

may be present. Aboard a NOAA ship, all embarked personnel are ancillary workers if not authorized to work with RAM.

Authorized User A person whose training and experience have been reviewed and approved by the NRC, who is named on the license, and who uses or directly supervises the use of licensed material. The AU is also known as the "principal investigator."

Offshore Waters The area of land and water, beyond Agreement States' Submerged Lands Act jurisdiction, on or above the U.S. Outer Continental Shelf, generally beyond three (3) nautical miles from shore.

Radioactive Material Material that exhibits spontaneous emission of radiation, either directly from unstable atomic nuclei or as a consequence of a nuclear reaction.

Radioactive Waste The term "low-activity waste" (LAW) does not have a statutory or regulatory definition, but generally includes wastes that contain some residual radioactivity, including naturally occurring radio-nuclides, which can be safely disposed of in hazardous or municipal solid waste landfills. For the purpose of this procedure, material with two (2) times the background radioactivity shall be considered as radioactive waste.

Radiation Safety Officer The person responsible for implementing the radiation protection program and named on the license as such. The RSO must have independent authority to stop operations that he or she considers unsafe. The RSO must have sufficient time and commitment from management to fulfill certain duties and responsibilities to ensure radioactive material is used in a safe manner, which includes supervising decontamination, ensuring security, controlling disposal, maintaining records, auditing the program, performing surveys, training personnel, and investigating abnormal events.

Radiation Worker A person who is authorized to work with radioactive material or equipment containing radioactive material and is directly supervised by an Authorized User. A radiation worker may be a federal employee, contractor, visiting scientist or a foreign national.

Warning Line System A system of free standing stanchions, nylon cord and small penants erected near or around a hazard. The highly visible temporary barrier only warns of the potential hazard. The warning line does not provide any restraint from entering the area with the hazard.

7. NOTES

Effect on Other Documents: Supersedes ENV 07, Radioactive Material aboard NOAA Ships, dated March 11, 2001

Distribution: MOC-A/P, NOAA ships

Attachments: NF 57-07-02, Request to Use Radioactive Material aboard a NOAA Ship
NF 57-07-03, Radioactive Material Usage aboard a NOAA Ship

Document History:

Version	Effective Date	Description of Changes
1.0	3/27/12	Initial Document