

Appendix 8

POLICY ON RADIOISOTOPES ONBOARD SKIO VESSELS

The introduction, use and disposal of radioisotopes onboard the research vessel R/V *Savannah* shall comply with the regulations of the Federal Nuclear Regulatory Commission (NRC) and State of Georgia statutes and be monitored or supervised by the SkIO Radiation Safety Officer (RSO). Requests for use of radioisotopes aboard the R/V *Savannah* must be submitted to the (RSO) at least 60 days in advance of the cruise.

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PRE-CRUISE PROCEDURES

1. The shiptime request form for the planned cruise shall include anticipated use of radioisotopes, including the type and amount, by the principal investigator.
2. Not less than sixty (60) days in advance of a scheduled cruise, the PI will provide the RSO with a detailed, written radioisotope use plan. This plan will be e-mailed to the RSO. This is in addition to the cruise plan. The written plan must include the following items:
 - a. A one-sentence statement of the general nature and objectives of the proposed work, plus a one-sentence statement of probable start and end dates, plus probability of repetitions later. Describe the location of work (latitude and longitude or distance and direction from a recognized landmark).
 - b. The name and pertinent experience of the person to be in charge of the radioisotope work aboard ship and lists of names and pertinent experience of all others who will handle radioisotopes aboard. Note that SkIO employees who handle radioisotopes must have a current radioisotope usage certificate. An online annual refresher course is available at <http://128.192.142.7/rad/radcourse/index.htm>. If the person has never received radioisotope usage training please contact the RSO. Non-SkIO personnel must submit a memo from their organization's RSO stating that the person has received radiation safety training adequate to satisfy requirements of 10CFR19 (not needed if a previous radioisotope use authorization for the specific PI and user had been granted and is on file with the SkIO RSO).
 - c. A list of all radioisotopes to be involved, chemical and physical forms of each, total of each in possession on the cruise, total of each to be in use at any time.

- d. A description of proposed activities in sufficient detail to permit determination of types and magnitudes of radiation hazards involved.
- e. A list of SkIO facilities to be used and any temporary isotope vans to be used. **UNSEALED RADIOACTIVE MATERIAL WILL BE RESTRICTED TO THE RADIOISOTOPE VAN.** Instruments with sealed sources may be allowed in the ship's lab only with the approval of the Marine Superintendent and the RSO.
- f. A list of pertinent safety devices and procedures:
 - 1. lab coats, gloves, shoe covers, other apparel
 - 2. portable radiation survey instruments to be provided by users
 - 3. proposed survey frequency and techniques
 - 4. personal dose reduction equipment to be provided by users (i.e. shields, forceps, long pipets, vial opening devices, etc.)
 - 5. fume hoods for gaseous isotopes, and storage – freezers & refrigerators (located on van drawing).
- g. A waste disposal plan

Note that the SkIO license does not permit discharge of radioactive wastes to the ocean; all wastes must be packaged and brought to shore for disposal. Disposal of radioactive waste by SkIO involves a separate fee; fee schedule is available on request.

- 3. If written information is satisfactory and after conferring with the Marine Superintendent, the SkIO RSO will prepare an SkIO Radiation Use Authorization. The Authorization will include:
 - a. work authorized, including location onboard, personnel, description of radioisotopes to be used,
 - b. conditions, including monitoring work, post-cruise surveying/clean-up and material disposal cost apportionment, and
 - c. appropriate signatures (P.I, RSO, Marine Superintendent).

CRUISE PROCEDURES

1. Monitoring/surveying
 - a. Monitoring areas of radioisotope usage will be done with the onboard survey meter and/or wipe tests by an authorized handler. The minimum frequency of monitoring must be specified in the Radiation Use Authorization form and approved by the SKIO RSO.
 - b. If a spill or other accident with radioisotopes occurs, the ship master and RSO must be notified and monitoring must be done immediately after clean-up, and pursued until background levels of radioactivity are recorded or as specified in the Radiation Use Authorization.
 - c. All monitoring results will be recorded on prepared forms, properly dated, and the surveyed areas will be marked on a deck plan of the ship to correspond with the recorded survey results.
2. Safety and protective equipment
 - a. Normal precautions in dealing with radioactivity must be maintained onboard:
 1. Cutting or diluting a “hot” stock solution must be done in a contained area, such as the metal sinks in the van. Sinks must be stoppered during these operations.
 2. The person in charge of radioisotope usage must either do this personally, or supervise on the spot.
 3. Special care should always be maintained when transporting, filtering or otherwise handling radioactive samples.
 4. Radioactive stocks must be maintained in a container with a fixed lid, to prevent accidental spills.
 - b. If a spill should occur, immediate steps must be taken to decontaminate the area, under the supervision of the person in charge of radioisotope usage.
 1. Decontamination procedures should continue until background levels are obtained on the survey instruments.
 2. The accident, and procedures used in the clean-up, must be recorded, including the volume and disintegrations per-minute lost.
 - c. No special protective equipment is required for most radioactive experiments onboard; however, the RSO will specify such if considered necessary.

3. Waste retention onboard
 - a. Solid waste must be stored in a well-labeled, transportable container with tight-fitting lid, and the container should be stored away from most lab activity. (usually plastic bags stored in a 55 gal. or similar drum on deck).
 - b. Liquid waste must be stored in a well-labeled, transportable, leak-proof plastic container, and the container should be stored away from most lab activity. Aqueous wastes should be segregated from solvents.
4. The ship's Master has absolute authority on all safety matters onboard.

POST-CRUISE PROCEDURES

1. Monitoring/surveying
 - a. An authorized radioisotope handler onboard will make a final radioactive survey and written report before departing the vessel.
 - b. If there are subsequent cruises departing away from SkIO where small amounts of radioisotopes could affect scientific data, the Marine Superintendent reserves the right to complete a baseline survey of the ship. This may be done by a representative of the University of Miami Tritium Labs under contract to NSF for this purpose or other individuals recommended by the RSO if locally available.
 - c. Wipe tests will also be performed by an authorized radioisotope handler. The number and location of wipe tests will be determined by the quantities involved and the areas of the ship possible exposed to radioactivity.
 1. Prior to a cruise departure, usually in the isotope use authorization, the RSO will recommend the materials to be used for the wipe.
 2. The RSO will specify the treatment of the wipe materials.
 - d. Results of survey-meter and wipe tests, will be recorded on prepared forms, properly dated, and the surveyed and/or wiped areas marked on a deck plan of the ship.
2. Clean-up Procedures
 - a. The authorized radioisotope user and PI will be responsible for any spillage of radioactive material and for the clean-up.

- b. Materials for clean-up must be available aboard the vessel before isotopes are used. Spill kits must include:

1. detergent and water
2. decontamination solution and water (i.e., Micro, Count-off, etc.)
3. absorbent materials

If a spill occurs the ship master must be notified immediately and the RSO contacted.

3. Waste disposal

- a. Sealed, labeled containers of solid and liquid waste will be off-loaded under the supervision of the person in charge of radioisotope usage.
- b. Appropriate waste disposal is the responsibility of the persons generating the waste. Detailed disposal procedures must be provided in the pre-cruise plan. Please consult with the SkIO RSO during the preliminary cruise planning if guidance is needed. The waste containers will be transported to the home institution of the persons generating the waste, by persons generating the waste, and at the cost of the person generating the waste (not at the cost of SkIO Ship Operations).

If the home institution is SkIO, waste disposal guidelines set by SkIO will be followed, with costs borne by the generator of the waste.

4. Re-Shipment of Unused/Opened Isotope Stocks or Standards

- a. All shipments of any unused portions of radioactive material are to be monitored by the institution whose license the scientist is operating under. It will be the responsibility of the person in charge of isotope usage during the cruise to ship any of these “leftovers” in accordance with all applicable Federal and State regulations and as per their respective institutional requirements. Please consult with the SkIO RSO during the preliminary cruise planning if guidance is needed.

5. Reports

- a. A written “Post Cruise Radioisotope Use Report” prepared by the person in charge of radioisotope use, will be given to the ship’s Master at the end of the cruise. The report will be on the form at the end of this appendix and will include:
 1. All the survey and wipe-test records and any reports of spills.
 2. Also a final disposition of materials (accountability) i.e., amount brought onboard, amount used, and amount remaining.

- b. The Master will include the report and all addenda with a preliminary cruise report to SkIO Ship Operations, who in turn will make two copies and distribute the copies to the RSO and the PI. A copy will be available for review by all subsequent PI's upon request.

6. Costs

The P.I. for the cruise is responsible for the removal of all radioactive materials and the clean-up of any contamination required. If it is necessary for SkIO's RSO to perform these tasks, the P.I. will be charged for the costs incurred.

HAZARDOUS MATERIALS

EPA and Institute Regulations Prohibit Improper Disposal. If found, contact the Radiation Safety Officer at (912) 598-2400.

<input type="checkbox"/> WASTE <input type="checkbox"/> SURPLUS	
DATE:	
PRINCIPAL RESEARCHER (PRINT)	
PHONE #	BUILDING, DEPARTMENT, ROOM #
CHEMICAL IDENTITY & CAS NUMBER	
SIGNATURE:	QUANTITY:
FOR HAZARDOUS MATERIALS PROGRAM USE ONLY:	

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DATE:	
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