

APPENDIX 11

POLICY ON RADIOISOTOPES ONBOARD OSU VESSELS

The introduction, use and disposal of radioisotopes onboard research vessels owned, operated and/or chartered by the College shall comply with the regulations of the Federal Nuclear Regulatory Commission (NRC) and State of Oregon statutes (ORS), be sanctioned by the OSU Radiation Safety Committee (OSURSC) and monitored or supervised as appropriate by the OSU Radiation Safety Officer (RSO).

The WECOMA operates under Oregon State University's radioactive materials license ORE-90005, issued by the State of Oregon. All possession and use of radioisotopes aboard must comply with State regulations and University procedures. For all activities outside of Oregon waters, additional specific arrangements must be made with the U.S. NRC and any other regulatory agencies having jurisdiction. In order to insure authorization approvals, training certificates, license amendments, reciprocity approvals, etc., are completed in time it is necessary for experimenters to submit their written requests for radiation use authorization at least sixty days in advance (the same timing required for the preliminary cruise plan).

For information and assistance concerning requests, or concerning other radiation safety matters, please contact the OSU Radiation Safety Officer (<http://oregonstate.edu/dept/radsafety/index.html>) at (541) 737-2227.

Pre-Cruise Procedures

1. The Shiptime request form (<http://www.gso.uri.edu/unols/ship/shiptime.html>) for the planned cruise shall include anticipated use of radioisotopes, including type and amount, by the principal investigator (PI) in Section Two.
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 is to be emailed to the RSO. (This is in addition to the Cruise Plan required by Section III, Pre-Cruise Planning Section of this manual.) The written use 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 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. List names and pertinent experience of all others who will handle radioisotopes aboard. Note that OSU employees who handle isotopes must have a personal information card and signed radioisotope orientation acknowledgment on file prior to departure. Non-OSU personnel must submit a memo from their organization's Radiation Safety Officer 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 at the OSU

Radiation Safety Office).

- 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 WECOMA facilities to be used and any temporary vans to be used. Unsealed radioactive material use will be restricted to the radioisotope van. Instruments with sealed sources may be allowed in the ship's labs only with the approval of the Marine Superintendent and RSO.
- f. A short discussion of pertinent safety devices and procedures:
 - 1. lab coats, gloves, shoe covers, other apparel,
 - 2. portable GM survey meters to be provided by users,
 - 3. proposed survey frequency and techniques,
 - 4. personnel 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
 - 6. storage - freezers & refrigerators (located on van drawing).
- g. A waste disposal plan.

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

- 5. If written information is satisfactory and after conferring with the Marine Superintendent and the OSU RSC, the RSO will prepare an OSU 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, waste 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 by an authorized radioisotope handler, and/or the marine technician. The minimum

frequency to be specified in the Radiation Use Authorization.

- b. If a spill or other accident with radioisotopes occurs, the Marine Technician 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 in 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 affixed 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 meter.
 - 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 Newport 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 when low energy beta emitters are used, the number determined by the quantities involved and the areas of the ship possibly exposed to radioactivity.
 - 1) Prior to a cruise departure, usually included 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 (stored for later "counting," or "counted" onboard ship if a suitable instrument is available).
 - d. Results of either survey-meter and/or wipe tests, depending on type of isotopes used, will be recorded on prepared forms, properly dated, and the surveyed and/or wiped areas marked on a deck plan of the ship (see Appendix 12).
2. Clean-up Procedures
 - a. The person who is responsible for any spillage of radioactive material is solely responsible for clean-up.
 - b. Materials for cleanup are available aboard the vessel as follows in order of severity of the spill:
 - 1) detergent and water
 - 2) decontamination solution and water (ie. Micro, Counts-off, etc.)
 - 3) Notify RSO for proper procedures
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. The waste containers will be transported to the home institution of the persons generating the waste, by the persons generating the waste, and at the cost of the persons generating the waste (not at the cost of OSU Ship Operations).
 - 1) If the home institution is OSU, waste disposal guidelines set by OSURSC will be followed, with costs borne by the generator of the waste.
 - 2) Persons not attached to OSU on a cruise may elect to have their radioactive waste handled by OSU, the costs to be borne by the non-OSU persons and the arrangements made through OSU Ship Operations before the beginning of the cruise (see Pre-Cruise Procedures).

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 "left overs" in accordance with all applicable Federal and State regulations and as per their respective institutional requirements. Please consult with either ship operations and/or the OSU Radiation Safety Office 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 OSU 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 cleanup of any contamination required. If it is necessary for OSU's RSO to perform these tasks, the P.I. will be charged for the costs incurred.

POST CRUISE RADIOISOTOPE USE REPORT

TODAY'S DATE: _____

CRUISE NAME & NUMBER: _____

CHIEF SCIENTIST/ISOTOPE USER: _____

1. Amount and type of isotopes brought onboard: _____

2. Amount and type of isotopes used during voyage: _____

3. Amount of isotopes disposed of and/or lost to atmosphere during voyage. (NOTE: It is illegal to dump isotopes at sea unless there is a specific exemption on your institutional license.)

4. Amount and type of isotopes remaining: _____

5. Was there any spillage of radioisotopes during your cruise? _____

6. Were all readings from surveys and/or wipes taken, within the limits specified by the Radioactive Materials Use Authorization? _____

7. Comments and/or Suggestions: _____
