

January 12, 2016

Docket No. 03006569

License No. 45-07112-01

Control No. 588858

Robin L. Elliott  
Health Physicist  
U. S. Nuclear Regulatory Commission  
Region 1, Division of Nuclear Materials Safety  
King of Prussia, PA 19406-2713

SUBJECT: COLLEGE OF WILLIAM AND MARY/VIMS REPLY TO REQUEST FOR  
ADDITIONAL INFORMATION CONCERNING APPLICATION FOR RENEWAL OF  
LICENSE CONTROL NO. 588858

Dear Ms. Elliott:

Please note our reply below to questions you posed by E-Mail on December 14,  
2015. Please acknowledge receipt of this communication.

1. Our Physical Address is: College of William & Mary  
Virginia Institute of Marine Science (VIMS)  
1375 Greate Road  
Gloucester Point, VA 23320

However, all Licensed Material will be used aboard Research Vessels in  
designated laboratories that are intended to support research with  
radioactive material.

2. Licensed material shall be used by, or under the supervision of  
Thomas W. Grose, Steve Kuehl, Patrice Mason, Kimberly Reece and  
Walker O. Smith.
3. (a) Appropriate training is provided prior to allowing personnel to enter  
restricted areas aboard research vessels (RV). After initial training is

taken and passed and the cruise for which one received the training is complete, additional refresher training is required prior to serving aboard a RV using licensed material in subsequent years.

(b) Training is provided to personnel prior to their initial use of licensed material aboard a RV. The exam consists of 50 multiple choice questions across the range of material covered in lecture and demonstration. A passing score of 80% or greater is required and the pass rate is approximately 99%. Refresher re-training is required after the initial RV cruise is completed, in subsequent years prior to serving as an Authorized or Supervised User on another RV cruise. Retraining will consist of a review of the principles and practices of using licensed material for research; safety and security procedures, a review of the specific restrictions and cautions applicable to the upcoming RV cruise and any new rules or regulations that may now be applicable. In addition, if there had been any incidents or violations since the last cruise, the lessons learned would be reviewed as well.

4. (a) Materials are delivered to a qualified Logistics Support Agency Representative (LSAR; ex. Raytheon Technical Services) or qualified member of the Research Team (RT) at the Port of Departure. If the RV is not in port when the licensed materials arrive, the materials are stored in a designated secure steel shipping container located at the pier of departure. If required, the materials are placed in a dedicated refrigerator/freezer within the shipping container until such time as the materials are loaded aboard the RV.

(b) The Principal Investigator (PI; typically a Ph.D. researcher) of the Research Team conducts the final surveys after all research is complete and waste properly contained. The surveys are conducted in accord with a diagram of the Lab and Equipment in the Lab. As we typically use Hydrogen-3 or Carbon-14 for our research, we prepare our wipe surveys for counting with an onboard Liquid Scintillation Counter. The results and copies of these surveys are shared with the LSAR in charge of the on board laboratory. In addition to our surveys, the LSAR conducts a second verifying final survey of his/her own, as a comparison survey to that which we have conducted. These surveys, which are expressed in

DPM, are reviewed by both the PI and LSAR. If the results of the surveys indicate contamination in excess of the established release limit, the PI's commercial airline ticket is withheld until such time as the laboratory is decontaminated and acceptable survey results are indicated by repeat surveys. As far as documentation; the survey map, areas surveyed and the results of the survey analysis are recorded and maintained together and included in the Cruise Records by the LSAR. It should be noted here that the RAM research laboratory is not "free released" but maintained as a designated RAM research lab for future research.

5. "We will use instruments that meet the radiation monitoring instrument specifications published in Appendix M to NUREG 1556 Vol. 7, "Consolidated Guidance About Materials, Licenses Program-Specific Guidance About Academic, Research and Development, and Other Licenses of Limited Scope," dated December 1999. We reserve the right to upgrade our survey instruments as necessary. The following type of instruments may be used to conduct required surveys: a Beckman Liquid Scintillation Counter or similar, a Ludlum Model 19 Micro R Meter or similar and a Ludlum Model 3 Survey Meter or similar, as appropriate for the licensed materials being used for research. The instruments are furnished by the National Science Foundation or LSAR for the research cruise.
6. The VIMS Research Team does not take Sealed Sources aboard Research Vessels.
7. We have done a prospective evaluation and determined that unmonitored individuals are not likely to receive, in one year, a radiation dose in excess of 10% of the allowable limits in 10 CFR Part 20 or we will monitor individuals in accordance with the criteria in the section entitled 'Radiation Safety Program-Occupational Dose' in NUREG 1556 Vol 7, 'Consolidated Guidance about Materials, Licenses, Program-Specific Guidance about Academic Research and Development, and Other Licenses of Limited Scope, dated December 1999.
8. We currently have a document titled "General Safety Rules for RAM Researchers" which appears as Appendix F in our Radiation Safety Plan.

We will review Appendix P of NUREG 1556 Vol. 7, "Consolidated Guidance About Materials, Licenses Program-Specific Guidance About Academic, Research and Development, and Other Licenses of Limited Scope" to determine if we need to add to or revise our current "General Safety Rules for RAM Researchers"

9. We currently have a document titled "Emergency Procedures" which appears as Appendix G of our Radiation Safety Plan. We will review Appendix P of NUREG 1556 Vol. 7, "Consolidated Guidance About Materials, Licenses Program-Specific Guidance About Academic, Research and Development, and Other Licenses of Limited Scope" to determine if we need to add or revise our current "Emergency Procedures.
  
10. Survey procedures within RAM Research Labs aboard RVs consist of surveys of all locations used within the past 24 hours that may potentially be contaminated. Weekly surveys are conducted of the entire laboratory by the PI and in addition the LSAR performs weekly confirmatory surveys as well. The LSAR reviews all the survey diagrams and results and recommends any remedial action necessary to the PI. The PI then directs his RT to assist in accomplishing any remedial action necessary after which surveys are repeated, analyzed and reviewed again by the LSAR. At the conclusion of all research activity with licensed materials the PI conducts detailed surveys within the laboratory, of equipment, of the segregated waste and waste containers. The surveys are analyzed and results documented and shared with the LSAR. In turn, the LSAR conducts his/her own detailed surveys of the lab, equipment, waste and so forth to confirm all is within acceptable limits. In addition, it is the LSAR's responsibility to conduct surveys as necessary throughout the research vessel to document that Licensed Material has NOT been spread outside the RAM research area. All original survey reports are compiled and maintained by the LSAR as part of the cruise documentation. "We will survey facility and maintain contamination levels in accordance with the survey frequencies and contamination levels published in Appendix Q to NUREG 1556 Vol. 7, "Consolidated Guidance about Materials, Licenses Program-Specific

Guidance About Academic, Research and Development, and Other Licenses of Limited Scope.

11. Radioactive wastes generated during RV cruises are segregated by the Research Team during daily research activity. At the conclusion of research activities the waste is packaged and turned over to the LSAR for storage and eventual disposal by appropriate methods. At no time is Licensed Material waste disposed of by ocean releases. The LSAR maintains the waste manifests and disposal documentation as part of their Research Cruise Records. The only exception to this practice is if the LSAR determines during the cruise that the wastes generated are not packaged properly or if the waste generated is not in accord with previously submitted waste profiles. If in fact this is true, the LSAR reserves the right to require that the waste be disposed of by the Virginia Institute of Marine Science. To date, this has not taken place in the past 20 plus years.

I hope these replies answer the questions you submitted and fulfill our responsibility with regard to our renewal request.

Regards,



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Radiation Safety Officer  
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