

**MATERIALS DECOMMISSIONING INSPECTION FIELD NOTES  
FOR FACILITIES NEEDING SIGNIFICANT DECOMMISSIONING EFFORT**

Region\_III  
Inspection Report No. 03033508/06-002  
License No. 24-09296-02  
Docket No. 030-33508  
Licensee (Name & Address) Southeast Missouri State University (SEMO) One University Plaza, College of Science and Mathematics, Cape Girardeau, MO 63701  
Licensee Contact Walt W. Lilly, Ph.D., Radiation Safety Officer  
Telephone No. 573-651-2359  
Last Amendment No. 11 Date of Amendment: 3/23/05 Program Code: 01110  
Date of Last Inspection 03/13/2006  
Date of This Inspection 07/11/2006  
Date of Next Inspection NA  
Type of Inspection: (X) Announced ( ) Unannounced  
( ) Routine (X) Special  
( ) Initial Decomm. ( ) Reinspection of Decomm.  
Inspection Frequency: (X) Normal ( ) Reduced ( ) Extended

Scope of Program/Description of Incident: **The licensee is a limited academic program which currently uses small quantities of licensed material for research and development, calibration, and student instruction. On July 7, 2006, the licensee notified Region III regarding the discovery of americium-241 contamination in the Chemistry Supply Room, located in Room 215, of Magill Hall which was undergoing renovation. See Section 3.D. below.**

Brief Description of Inspection Activities: **This special inspection was conducted on July 11, 2006, to review the circumstances surrounding the reported contamination.**

Brief Description of Findings and Action: **The inspectors determined that the contamination identified by the licensee was below both NRC and license condition notification requirements of 22,000 dpm/100cm<sup>2</sup> and 110,000 dpm/100cm<sup>2</sup> for americium-241, respectively, and the licensee's efforts to decontaminate the aforementioned area and equipment were adequate.**

**The inspectors identified one violation of 10 CFR Part 20, Subpart F, Survey and Monitoring, Section 20.1501, "General," in that the licensee failed to survey a contaminated piece of furniture prior to releasing it to an unrestricted area. This violation was documented as an Non-Cited Violation (See Section 4).**

**The NRC inspectors discussed the preliminary findings with Chris McGowan, Ph.D., Dean, College of Science and Mathematics and Dr. Walt Lilly, University's Radiation Safety Officer. On July 28, 2006, the inspectors conducted a final telephone exit interview with Dr. Lilly.**

Inspector(s):  
George McCann GMM by phone

Date: 08/02/06

Samuel Mulay

Date: 8/2/06

Approved: Jamnes L. Cameron, Chief Decommissioning Branch

Date: 8/2/06

1. **SUMMARY OF DECOMMISSIONING STATUS: See Description Below**

- A. Licensee ceased operational program. ( ) Y ( ) N
- B. Required decommissioning financial assurance mechanisms in place. ( ) Y ( ) N
- C. Decommissioning Plan (DP) required. ( ) Y ( ) N
- D. Licensee final survey required. ( ) Y ( ) N
- E. NRC confirmatory survey required. ( ) Y ( ) N
- F. NRC closeout inspection required. ( ) Y ( ) N
- G. Licensee doing decommissioning planning and preparation before dismantlement. ( ) Y ( ) N
- H. Licensee actively remediating site. ( ) Y ( ) N
- I. Licensee completed site remediation. ( ) Y ( ) N

Description of Facility Status: **A spill involving americium-241 occurred during calendar year 2000 in Magill Hall at which time, the university underwent significant decommissioning of Magill Hall facilities. The NRC subsequently released the Magill Hall for unrestricted use. However, the licensee committed to survey items removed from Magill Hall since the possibility of low levels of contamination may exist on laboratory equipment and materials. The licensee has a commitment in its license to obtain the services of a licensed decommissioning contractor, should established contamination limits specified in the license be exceeded.**

2. **INSPECTION OF KEY DECOMMISSIONING ACTIVITIES**

**This area was not reviewed.**

A. **LICENSEE ACTIVITIES INSPECTED BEFORE DISMANTLEMENT**

- 1. SNM inventory cleanout/off-site removal of licensed material used in operations has been performed by licensee. ( ) Y ( ) N
- 2. Facility license conditions are in place and met by licensee. ( ) Y ( ) N
- 3. Site security and control of contaminated material being maintained in compliance with 10 CFR 20.1801 and 20.1802. ( ) Y ( ) N
- 4. Support systems and services (e.g., lighting, water supply) are in place. ( ) Y ( ) N
- 5. Decommissioning schedules are consistent with timeliness requirements in 10 CFR 30.36, 40.42, and 70.38. ( ) Y ( ) N
- 6. Licensee's recordkeeping is consistent with 10 CFR 30.35, 40.36, and 70.25. ( ) Y ( ) N
- 7. Financial assurance requirements are being maintained in accordance with 10 CFR 30.35, 40.36, and 70.25. ( ) Y ( ) N
- 8. Licensee is conducting site characterization in accordance with applicable radiation protection procedures. ( ) Y ( ) N
- 9. Construction of new site features (e.g., roads, rail spurs, staging areas, sediment control ponds) conforms to DP and does not compromise health and safety of workers and public. ( ) Y ( ) N
- 10. Licensee activities conform to specific license conditions and licensee programs and procedures. ( ) Y ( ) N
- 11. Other licensee activities: ( ) Y ( ) N

Basis for Findings:

B. **LICENSEE ACTIVITIES INSPECTED DURING DECONTAMINATION, DISMANTLEMENT, AND SITE REMEDIATION: See Description Below**

- 1. Site security and control of contaminated material are being maintained in compliance with 10 CFR 20.1801 and 20.1802. ( ) Y ( ) N

2. Decontamination and dismantlement of structures are being performed consistent with DP and sound industry practice (structures include buildings, utilities, treatment lagoons, etc.). ☐ Y ☐ N
3. Decontamination and remediation of the following are being performed consistent with DP and sound industry practice:
  - a. Soil. ☐ Y ☐ N
  - b. Sediment. ☐ Y ☐ N
  - c. Surface waters. ☐ Y ☐ N
  - d. Groundwater. ☐ Y ☐ N
  - e. Other mediums: ☐ Y ☐ N
4. Licensee release and disposal of decommissioning wastes are consistent with DP and approved by NRC for:
  - a. Liquid wastes (e.g., groundwater, surface water, liquid from treatment ponds, process liquids). ☐ Y ☐ N
  - b. Solid wastes (e.g., building materials, process and other facility equipment, concrete rubble, soil). ☐ Y ☐ N
  - c. Other wastes: ☐ Y ☐ N
5. Temporary, onsite storage of low-level radioactive wastes from decommissioning meets license conditions and guidance in IP 84890. ☐ Y ☐ N
6. Packaging and shipment of radioactive waste materials meet requirements in 40 CFR Parts 171-178 and 10 CFR Part 71. ☐ Y ☐ N
7. Restoration of Site - Licensee has restored site to meet license conditions and NRC-approved plans. ☐ Y ☐ N
8. Licensee survey of material and equipment for free release sufficient to demonstrate compliance with release criteria. ☐ Y ☐ N
9. Other licensee activities: ☐ Y ☐ N

**Basis for Findings: Onsite observations by NRC inspectors. The licensee followed good decommissioning practices, except for the inadvertent release of a shelving unit noted in section 3.D. below. The licensee is currently developing a new procedure which will describe how the licensee will survey and release rooms and materials in the future from Magill Hall. These new procedures will be submitted to the NRC Region III Materials Licensing Branch for review and incorporation as an amendment to the current license.**

**The Section below was not reviewed.**

**C. LICENSEE ACTIVITIES INSPECTED AFTER COMPLETION OF SITE REMEDIATION**

1. Licensee has submitted NRC Form 314 for disposition of licensed material in accordance with 10 CFR 30.36, 40.42, and 70.38. ☐ Y ☐ N
2. Licensee's final survey program is acceptable (see Appendix B for inspection items for final surveys). ☐ Y ☐ N
3. NRC confirmatory survey performed. ☐ Y ☐ N
4. Site maintenance activities (if any, for restricted use) conform to license conditions and NRC-approved plans and are in place and functional. ☐ Y ☐ N
5. Other licensee activities: ☐ Y ☐ N

Basis for Findings:

Sections 3.A and 3.B below were not applicable and were therefore not reviewed.

3. **INSPECTION OF STANDARD HEALTH AND SAFETY AREAS FROM THE OPERATIONAL INSPECTION PROGRAM**

A. GENERAL OVERVIEW

1. Describe the licensee's decommissioning organizational structure:
  - a. Licensee is performing decommissioning activities in compliance with its approved decommissioning plan. ☐ Y ☐ N
  - b. Licensee has implementing procedures for the decommissioning activities identified in the DP. ☐ Y ☐ N
  - c. The RSC and RSO fulfill license requirements to deal with all decommissioning activities. ☐ Y ☐ N

Basis for Findings:

B. FACILITIES

1. Describe, from field observation, the licensee-identified facilities and outdoor areas to be decommissioned:
2. The licensee's remediation plan includes all the contaminated facilities and areas on-site and off-site. ☐ Y ☐ N
3. All essential systems and services (e.g., electrical power, water supply, communications systems) are in place and functional for the planned decommissioning activities. ☐ Y ☐ N
4. Licensee's emergency plan is in place and operative for the duration of decommissioning. ☐ Y ☐ N
5. For complex sites needing site characterization, describe the key site characterization activities to be performed by the licensee to determine the nature and extent of contamination:
6. Licensee's characterization activities performed in conformance with good industry practice. ☐ Y ☐ N

Basis for Findings:

C. EQUIPMENT AND INSTRUMENTATION

1. Survey instruments are applicable to contaminants of interest. ☒ Y ☐ N
2. Use of survey instruments appropriate for site. ☒ Y ☐ N

Basis for Findings: **Onsite observations by NRC inspectors. The licensee's instruments were properly calibrated and checked for efficiency.**

D. MATERIALS: **See Basis Section**

1. Radioactive materials licensed during operations have been removed offsite; residual quantities conform to license conditions. ☐ Y ☐ N
2. Security and control of licensed materials, including contaminated areas, is being maintained. ☐ Y ☐ N

Basis for Findings: **On July 7, 2006, the licensee notified Region III regarding the discovery of americium-241 contamination in the Chemistry Supply Room located in Room 215 of Magill Hall which was undergoing renovation. This area was used**

as a staging area for stock chemicals and equipment (glassware, etc), for use in the chemistry department. The renovation involved the removal of cabinetry on which were stored a variety of laboratory related equipment. The RSO performed surveys of cabinets, shelves, floor, etc with only one minor spot of contamination noted. Prior to the removal of a shelf from another cabinet unit, the RSO left the area and returned approximately 10 minutes later and discovered that workers had removed the last cabinet, carrying it about 25 feet to a University truck. The vehicle and cabinet did not leave the loading area. Surveys performed by the RSO of the floor beneath the unit revealed readings ranging from 149 dpm/100cm<sup>2</sup> to 6695 dpm/100cm<sup>2</sup>. The RSO's survey of the truck identified small areas of contamination ranging from 196 dpm/100cm<sup>2</sup> to 10,386 dpm/100cm<sup>2</sup>. Wipe tests for removable contamination were performed on the vehicle and identified approximately 80 dpm/100cm<sup>2</sup>. Surveys of workers revealed approximately 35 dpm on shoes.

Room 215 was subsequently locked and properly posted. The transport vehicle was decontaminated, surveyed, and released on July 10, 2006, exhibiting 18 dpm/100cm<sup>2</sup> of fixed gross alpha contamination, which is well below the licensee's unrestricted release criteria of 100 dpm/100 cm<sup>2</sup>.

The inspectors conducted interviews with appropriate licensee staff to determine the historical perspective of Room 215 and to recreate the facts involved in the incident. The inspectors also performed confirmatory surveys of Room 215, the transport vehicle involved (cargo area, lift, drivers compartment, etc.). Confirmatory surveys were also conducted in randomly selected laboratories, hallways, and outside (unrestricted) areas with no readings noted above the established release levels. Additionally, the inspectors observed the performance of surveys by the licensee in Room 215 and other areas with no problems noted.

#### E. TRAINING

1. Licensee has developed training program for new decommissioning activities (e.g., demolition of structures, excavation of soil); program is adequate. ( ) Y ( ) N
2. Training program being effectively implemented. ( ) Y ( ) N

**Basis for Findings: In general, the licensee's training is adequate. As previously noted, a contaminated shelving unit was moved prior to survey. The action was immediately noted by the RSO who promptly re-trained the two University workers who were assisting in the movement of the furniture.**

#### F. AREA RADIATION SURVEYS AND CONTAMINATION CONTROL

1. Area surveys are being performed in areas being decommissioned. (X) Y ( ) N
2. Where active remediation (e.g., demolition of structures, excavation of soil) is being performed, radiation levels in unrestricted areas do not exceed 2 mrem in any one hour. (X) Y ( ) N

**Basis for Findings: On site inspectors observations.**

#### G. RADIATION PROTECTION

## G. RADIATION PROTECTION

1. The licensee's approved health physics program is being implemented in the field for new decommissioning activities. (X) Y ( ) N
2. Site security and control of contaminated material are in compliance with 10 CFR 20.1801 and 20.1802. (X) Y ( ) N

Basis for Findings: **On site inspectors observations.**

**This program area was not reviewed**

## H. RADIOACTIVE WASTE MANAGEMENT/EFFLUENTS/ENVIRONMENTAL MONITORING

1. Offsite disposal of decommissioning wastes conforms to free release criteria and disposal site requirements. ( ) Y ( ) N
2. All new effluent releases conform to DP and applicable regulations. ( ) Y ( ) N
3. The licensee's environmental monitoring program is being implemented in conformance with the DP and all applicable limits are being met. ( ) Y ( ) N
4. Temporary storage/staging areas for radioactive wastes from building demolition, equipment dismantlement, soil excavation, etc., are adequately posted and protected. ( ) Y ( ) N

Basis for Findings:

**This program area was not reviewed.**

## I. RECORDKEEPING FOR DECOMMISSIONING

1. Copies of the licensee's decommissioning cost estimates and funding methods are on file. ( ) Y ( ) N
2. Licensee has adequate records for decommissioning activities performed (e.g., for decontamination and dismantlement of structures; decontamination and remediation of soil, sediment, surface waters, groundwater; surveys of remediated facilities). ( ) Y ( ) N
3. Licensee's financial assurance conforms with the financial assurance requirements of NRC-approved possession limits and NRC regulations. ( ) Y ( ) N

Basis for Findings:

**This program area was not reviewed**

## J. TRANSPORTATION

1. Describe the licensee's program to package and ship decommissioning waste materials:
2. Licensee's program meets all applicable 10 CFR and 49 CFR requirements for marking labeling, placarding, and shipping paper requirements for radioactive waste shipments. ( ) Y ( ) N

Basis for Findings:

## K. POSTING AND LABELING

1. All contaminated areas, waste processing areas, and waste handling areas are posted in conformance with regulations. (X) Y ( ) N
2. Packaged radioactive waste materials are labeled in accordance with regulations. **Not reviewed** ( ) Y ( ) N

Basis for Findings: **Following the discovery of the aforementioned contamination in Room 215, the RSO immediately locked and posted the area appropriately.**

#### L. OCCUPATIONAL HEALTH AND SAFETY

1. Describe the occupational health and safety observations made at the licensee's facilities: **The licensee and licensee's decommissioning contractor had instituted appropriate use of protective laboratory coat, gloves and foot coverings for all personnel performing surveys and decontamination activities in areas restricted for protection against radiological contamination.**
2. Licensee and Occupational Safety and Health Administration were informed of occupational health and safety issues observed during the inspection.  
( ) Y (X) N

Basis for Findings: **Onsite observations by NRC inspectors.**

#### 4. **VIOLATIONS, NON-CITED VIOLATIONS, FOLLOWUP ITEMS, AND OTHER ISSUES**

Briefly state (1) the requirements and (2) how and when the licensee violated the requirement. For non-cited violations, indicate why the violation was not cited. Briefly describe followup items and other issues.

**The NRC identified a violation for failure to survey a radiologically contaminated item prior to its removal from Magill Hall to an unrestricted area. However, the NRC is treating this violation as a Non-Cited Violation (NCV), consistent with Section VI.A of the Enforcement Policy. This NRC action was taken, since the violation was self-identified, the violation was not repetitive or willful in nature, and the University implemented effective corrective actions as a result of the incident. Specifically, University workers were immediately monitored for contamination and provided refresher instruction regarding radiological survey requirements. A new draft survey procedure was developed for use in the survey of and release of materials from Magill Hall, and is currently being coordinated with the NRC Region III Licensing Branch.**