February 24, 2010

Ms. Jackie Jones, Vice Chancellor
Administrative Services
Curators of the University of Missouri
319 Jesse Hall
Columbia, MO 65211-1250

SUBJECT: NRC REACTIVE INSPECTION REPORT 030-02278/10-01(DNMS) – UNIVERSITY OF MISSOURI

Dear Ms. Jones:

On January 26 and 27, 2010, the U.S. Nuclear Regulatory Commission (NRC) conducted a reactive inspection at the University of Missouri, Columbia, Missouri Campus. The purpose of this inspection was to assess the University's actions to address radiological contamination identified in two Academic Halls. The University notified the NRC of this issue in a letter dated November 17, 2009. At the conclusion of the inspection on January 27, 2010, the NRC inspectors discussed the inspection findings with you and members of the University's senior management.

The inspection consisted of an examination of activities as they relate to safety and compliance with the Commission's rules and regulations. Areas examined during the inspection are identified in the enclosed report. Specifically, the NRC performed independent radiological surveys, discussed and reviewed the University's decommissioning contractor's initial radiological survey characterization work, and evaluated the University's actions to comply with NRC regulations for protection against radiation. Within these areas, the inspection consisted of a selective examination of procedures and representative records, interviews with personnel, and the conduct of independent NRC surveys.

Based on the inspection findings, no violations of NRC requirements were identified.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosures will be available electronically in the NRC Public Document Room or from the NRC's Agencywide Documents Access and Management System (ADAMS). The NRC's document system is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html.

We will gladly discuss any questions you may have regarding this inspection.

Sincerely,

/RA/ Robert G. Gattone Acting For/

Tamara E. Bloomer, Chief
Materials Inspection Branch

Docket No. 030-02278
License No. 24-00513-32

Enclosure:
Inspection Report 030-02278/10-01(DNMS)

cc w/encls: Jack Crawford, Radiation Safety Officer
State of Missouri

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cc w/encls: Jack Crawford, Radiation Safety Officer
State of Missouri

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U.S. NUCLEAR REGULATORY COMMISSION
REGION III

Docket No.:	030-02278
License No.:	24-00513-32
Report No.:	030-02278/10-001(DNMS)
Licensee:	The Curators of the University of Missouri 311 Jesse Hall Columbia, MO
Facilities:	Pickard Hall Schweitzer Hall
Inspection Dates:	January 26-27, 2010
Exit Meeting:	January 27, 2010
Inspectors:	Mike McCann, Senior Health Physicist Peter J. Lee, PHD, CHP, Health Physicist Katie N. Streit, Health Physicist
Approved By:	Tamara E. Bloomer, Chief Materials Inspection Branch Division of Nuclear Materials Safety

Enclosure

EXECUTIVE SUMMARY

The Curators of the University of Missouri
NRC Inspection Report 030-02278/10-01(DNMS)

This was a reactive inspection to assess the University's actions after the discovery of radiological contamination in Pickard Hall; an academic hall located at the University's Columbia, Missouri campus. This issue was brought to the U.S. Nuclear Regulatory Commission's (NRC) attention in a November 17, 2009, letter from the University. The letter notified the NRC that the University believed that the provisions of Title 10 Code of Federal Regulation (CFR) 30.36 "Expiration and termination of licenses and decommissioning of sites and separate buildings or outdoor areas," was applicable to Pickard Hall.

The University of Missouri, Columbia Campus, possesses an NRC Broadscope license, which authorizes possession of a wide range of radioactive materials for medical and academic research. The licensee's program is managed by a Broadscope Committee, and overseen by a professional staff of health physicists. As of 2008, the University had 182 individuals authorized to use radioactive materials, and as of January 2010, the University uses radioactive materials in 431 laboratories in 66 on-campus buildings.

The licensee informed the NRC that residual radioactivity believed to be naturally occurring radioactive material (NORM) had been identified in the basement of Pickard Hall from activities that occurred early in the 1900's, and that this contamination exceeded the NRC's radiological screening values for unrestricted use. Based on the discovery, the licensee employed a decommissioning contractor to assist the University with further characterization surveys of Pickard Hall. The contractor performed these surveys during the week of December 7, 2009. The licensee's survey results indicate the presence of thorium-232 contamination, which infers that this material may have been used in the building.

A second University academic hall was surveyed by the NRC. The licensee's Schweitzer Hall was also determined to have some residual NORM contamination. This contamination resulted after the research activities were moved from Pickard Hall to Schweitzer Hall. Schweitzer Hall is used by the University's Biochemistry Department.

NRC Close-out Surveys and Inspections

- The licensee is implementing appropriate measures and has acquired resources to characterize the residual contamination found at Pickard and Schweitzer Halls. The licensee and the NRC's survey results indicate no person or area has exceeded the public dose limits.
  (Section 1)

Radiation Protection

- The inspectors concluded that the University's actions regarding posting and control to restricted areas were compliant with NRC regulations. (Section 2)

Report Details

1 NRC Close-out Surveys and Inspections (IP 83890)

1.1 Inspection Scope

The inspectors evaluated the licensee's site characterization activities by interviewing the Radiation Safety Officer (RSO), the licensee's health physics staff, and a representative of the licensee's decommissioning contractor. The inspectors reviewed the University's Characterization Work Plan dated November 2009 prepared by the University's contractor, to evaluate the radiological conditions of Pickard Hall.

The inspectors also performed limited radiological surveys in the basement, first, second, and attic floors of Schweitzer Hall. Schweitzer Hall was also determined to have some residual NORM contamination. This contamination resulted after the research activities were moved from Pickard Hall to Schweitzer Hall.

The NRC inspectors performed radiological surveys of inside and outside areas of both Pickard and Schweitzer Halls using calibrated survey meters. The inspectors' measurements included general area gamma radiation measurements for estimating dose rates, direct surface measurements for fixed surface radiological contamination, and the performance of a field test to ascertain the presence of removable contamination. The inspectors surveyed the immediate outdoor areas of each building, focusing on downspouts, manholes, and areas found to be radiologically elevated during the licensee's characterization survey. The inspectors evaluated the licensee's compliance with NRC regulations regarding steps to prevent access to contaminated areas.

1.2 Observations and Findings

During the week of December 7, 2009, the licensee's contractor performed general characterization surveys of Pickard Hall that included dose rate and ambient gamma radiation measurements, and tests for removable contamination in accessible areas in Pickard Hall. These surveys included classrooms, staff offices, display areas in a museum, general public areas, the building attic, a basement access port to a steam tunnel that runs between several University halls and mechanical and storage rooms in the basement. The decommissioning contractor performed additional measurements to further evaluate fixed and removable alpha and beta activity in locations of elevated dose rates; and collected concrete samples inside the building, and soil samples outside the building for analysis. The contractor also performed dose rate and ambient gamma residual radiation measurements outside Pickard Hall. The licensee's characterization survey and assessment is still on-going and is expected to be completed by spring 2010.

During the conduct of the characterization survey, the contractor identified several localized areas of elevated radiological dose rates throughout the building and removable contamination in localized areas on the floor of a mechanical room in the basement and on the attic floor around brick ducts from former fume hoods. The licensee restricted access to three rooms in the basement and the attic which contained the highest dose rates and removable contamination.

The NRC inspectors measured an average dose rate of approximately 20 microroentgens per hour (μR/h) in the unrestricted areas of the Pickard Hall basement, 15 μR/h on the first and second floors and 12 μR/h in the northwest area outside the Hall. The highest elevated dose rate identified in a general unrestricted area by the inspectors was 35 μR/h and the highest level in a restricted area of the basement was 75 μR/h. The inspectors estimated an overall average background inside the building to be approximately 8 μR/h, and 10 μR/h outside the building. The inspectors' contamination in-field tests did not identify removable contamination. Additional, surveys of janitor mops and floor buffers also did not identify any removable or fixed contamination. The NRC survey measurements were consistent with the decommissioning contractor's draft characterization results.

The inspectors estimated potential public doses for individuals occupying unrestricted areas of Pickard Hall, using the licensee's information regarding personnel building occupancy, and concluded that NRC public dose limits would not be exceeded.

The inspectors' surveys performed in Schweitzer Hall identified radiation levels consistent with ambient radiation background levels of approximately 10 μR/h, except for one area on the second floor that measured approximately 30 μR/h. This area was in the vicinity of a laboratory authorized under the University's Broadscope license to use radioactive materials. The room was appropriately posted and the radiation level was below the NRC public dose limits. The inspectors' surveys performed outside Schweitzer Hall did not identify any radiation levels greater than background.

The licensee identified to the NRC inspectors a posted restricted area in the attic of Schweitzer Hall. The licensee informed the inspectors that after previous remediation projects performed in 1960 and 1982, radium-226 remained in a fan room of the attic. To prevent the spread and reduce radiation levels, the licensee poured several inches of concrete over the contaminated area. The licensee is tracking this area pursuant to 10 CFR 30.35 "Financial assurance and recordkeeping for decommissioning," and will address the decommissioning of this area when licensed activities have ceased in the Hall. The inspectors were also informed that residual levels of contamination may also be embedded in the Hall's roof. Since the Hall's roof is in need of replacing, the licensee has contracted with a decommissioning contractor to perform characterization surveys on the roof.

1.3 Conclusions

The licensee is implementing appropriate measures and has acquired resources to characterize the residual contamination found at Pickard and Schweitzer Halls. The licensee and NRC's survey results indicate no person or area has exceeded the public dose limits.

2 Radiation Protection (IP 83822)

2.1 Inspection Scope

The NRC inspectors evaluated and observed the licensee's actions to control restricted areas. The NRC inspectors interviewed Licensee Health Physics staff regarding posting, access controls and training of employees for these areas.

2.2 Observations and Findings

The licensee's postings of access points designated as restricted areas, such as the door providing access to the mechanical room where removable contamination was found during the licensee's characterization surveys was compliant with NRC regulations. Also, personnel were noted to be using area and personnel dosimeters for monitoring external dose to workers appropriately. The licensee had instituted adequate access controls and provided adequate worker training for University staff working in the Hall.

2.3 Conclusions

The inspectors concluded that the University's actions regarding posting and control to restricted areas were compliant with NRC regulations.

3 Exit Meeting

At the completion of the on-site inspection, the inspectors discussed the inspection findings in this report with licensee management during an exit meeting on January 27, 2010. The licensee did not identify any information reviewed during the inspection as proprietary in nature.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

J. Jones, University of Missouri, Vice Chancellor Administrative Services
K. Finley, University of Missouri, Environmental Compliance Specialist
R. Riddlemoser, University of Missouri, Acting Director of Environmental Health & Safety
J. Crawford, University of Missouri, Radiation Safety Officer,

participated in exit meeting

LIST OF PROCEDURES USED

IP 83890	Closeout Inspections and Surveys
IP 83822	Radiation Protections

LIST OF ACRONYMS USED

CFR	Code of Federal Regulations
NORM	Naturally occurring radioactive material
NRC	Nuclear Regulatory Commission
µR/h	Microroentgens per hour
RSO	Radiation Safety Officer

PARTIAL LIST OF DOCUMENTS REVIEWED

Licensee documents reviewed and utilized during the course of this inspection are specifically identified in the “Report Details” above.

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened	Type	Summary
None		

Closed
None

Discussed
None

Attachment