March 29, 2007

Mr. Ralph Butler, Director
Research Reactor Center
University of Missouri - Columbia
Research Park
Columbia, MO 65211

SUBJECT: NRC ROUTINE INSPECTION REPORT NO. 50-186/2007-201

Dear Mr. Butler:

On March 19 - 22, 2007, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your University of Missouri - Columbia Research Reactor facility. The enclosed report documents the inspection results, which were discussed on March 22, 2007, with you and members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspector reviewed selected procedures and records, observed activities, and interviewed personnel. Based on the results of this inspection, no findings of significance were identified.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Johnny H. Eads, Branch Chief
Research and Test Reactors Branch B
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

Docket No. 50-186
License No. R-103

Enclosures: NRC Inspection Report No. 50-186/2007-201

cc w/enclosure: Please see next page

cc:

University of Missouri
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Test, Research, and Training
Reactor Newsletter
University of Florida
202 Nuclear Sciences Center
Gainesville, FL 32611

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ACCESSION NO.: ML070871060 **TEMPLATE #: NRR-**

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DATE	03 /29/2007	03 /29/2007	03/29/2007

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U. S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION

Docket No.:	50-186
License No.:	R-103
Report No.:	50-186/2007-201
Licensee:	Curators of the University of Missouri - Columbia
Facility:	University of Missouri - Columbia Research Reactor
Location:	Research Park Columbia, Missouri
Dates:	March 19-22, 2007
Inspector:	Craig Bassett
Approved by:	Johnny H. Eads, Branch Chief Research and Test Reactors Branch B Division of Policy and Rulemaking Office of Nuclear Reactor Regulation

EXECUTIVE SUMMARY

University of Missouri - Columbia
University of Missouri - Columbia Research Reactor
Report No.: 50-186/2007-201

The primary focus of this routine, announced inspection was the onsite review of selected aspects of the licensee's 10 Megawatt, Class I research reactor safety programs including: organizational structure and staffing, review and audit and design change functions, radiation protection, effluent and environmental monitoring, and transportation of radioactive materials since the last NRC inspection of these areas. The licensee's programs were acceptably directed toward the protection of public health and safety, and in compliance with NRC requirements.

Organization and Staffing

- The licensee's organization and staffing were in compliance with the requirements specified in Technical Specifications Section 6.1.

Review and Audit and Design Change Functions

- Review and oversight functions required by Technical Specifications Section 6.1 were acceptably completed by the Reactor Advisory Committee.

- The design change program and procedures, which outlined the review and evaluation of changes to structures, systems, and components, and procedures and other documentation at the facility, satisfied NRC requirements.

Radiation Protection

- Surveys were completed and documented as outlined in the Annual Report.

- Postings met regulatory requirements.

- Personnel dosimetry was being worn as required and recorded doses were within the NRC's regulatory limits.

- Radiation survey and monitoring equipment was being maintained and calibrated as required.

- The Radiation Protection and ALARA Programs satisfied regulatory requirements.

- Annual reviews of the Radiation Protection Program were being completed by the licensee as required by 10 CFR Part 20.

- Radiation protection training was being conducted and was acceptable.

Effluent and Environmental Monitoring

- Effluent monitoring satisfied license and regulatory requirements and releases were within the specified regulatory and Technical Specifications limits.

Transportation of Radioactive Materials

- Radioactive material was being shipped in accordance with the applicable regulations.

REPORT DETAILS

Summary of Plant Status

The University of Missouri - Columbia Research Reactor (MURR) continued to be operated in support of isotope production, silicon irradiation, reactor operator training, and various types of research. During the inspection, the reactor was operated continuously during the week to support laboratory experiments and product irradiation.

1. Organization and Staffing

a. Inspection Scope (Inspection Procedure [IP] 69006)

To verify that the staffing and organizational structure requirements were being met as specified in Technical Specifications (TS), Section 6.1, Revision (Rev.) Number (No.) 13, dated January 29, 2004, the inspector reviewed:

- current MURR organizational structure
- administrative controls and management responsibilities
- MURR Reactor Operations Annual Reports for 2005 and 2006
- operations and health physics staffing requirements for safe operation of the facility

b. Observations and Findings

The inspector noted that the organizational structure had not changed since the last inspection in the area of radiation protection (refer to NRC Inspection Report No. 50-186/2006-205). The Reactor Operations group was adequately staffed although three reactor operator trainee slots were vacant. The Health Physics (HP) section, within the Regulatory Assurance Group, was also adequately staffed with a Health Physics Manager, a Rad Waste Coordinator and a Project Manager (who were Health Physicists) and three HP technicians. One HP technician position was open at the time of the inspection.

The organization and staffing at the facility required for reactor operation, and required to support the operation thereof, were as specified in the TS. Qualifications of the staff members met program requirements. Review of records indicated that management responsibilities were discharged as required by applicable procedures.

c. Conclusions

The licensee's organization and staffing were in compliance with the requirements specified in TS Section 6.1.

2. Review and Audit and Design Change Functions

a. Inspection Scope (IP 69007)

In order to verify that the licensee had established and conducted reviews and audits as required by 10 CFR Part 20 and TS Section 6.1, the inspector reviewed:

- Radiation Protection Plan Audit for 2005 and 2006
- Selected audits and reviews completed by various management and Health Physics (HP) personnel
- Selected Subcommittee meeting minutes from March 2006 to the present including the Isotope Use Subcommittee, the Reactor Safety Subcommittee, and the Procedure Review Subcommittee
- MURR Reactor Advisory Committee (RAC) meeting minutes, and related documents, from February 2006 to the present
- MURR Procedure AP-RR-003, "10 CFR 50.59 Evaluations," Rev. 4, issued July 6, 2006
- MURR Procedure AR-RO-115, "Modification Records," Rev. 2, issued October 20, 2005

b. Observations and Findings

(1) Review and Audit Functions

The inspector reviewed the meeting minutes of the RAC and the meeting minutes of various subcommittees from February 2006 to the present. The minutes, and associated documents, indicated that the committee met at the required frequency and that a quorum was present. The topics considered during the meetings were appropriate and as stipulated in the TS.

A subcommittee of the RAC or other designated persons, including HP personnel, conducted audits and reviews as required and the full RAC reviewed the results. The inspector noted that no significant issues were identified during the audits conducted by the licensee. The inspector also verified that the licensee had completed annual reviews of the Radiation Protection Program as required by 10 CFR Part 20. All aspects of the program had been reviewed. The inspector noted that the safety reviews and audits, and the associated findings, were acceptably detailed and that the licensee responded and took corrective actions as needed.

(2) Design Change Functions

The regulatory requirements stipulated in 10 CFR 50.59 were implemented at the facility through MURR Procedures AP-RR-003 and AR-RO-115. The procedures were developed to address activities that affected changes to the facility Hazards Summary Report (HSR), modifications to the facility, changes to MURR procedures, new tests or experiments not described in the HSR, revisions to NRC approved analysis methodology, and/or proposed compensatory actions to address degraded or non-conforming conditions. The procedures adequately incorporated criteria provided by the regulations with additional requirements mandated by local conditions.

The inspector reviewed selected Modification Records and 50.59 Screen Forms processed during the latter part of 2006. The completed forms showed that the issues were acceptably reviewed in accordance with the procedures. Also, none of the changes or modifications were determined to constitute a safety question

or concern and none required a license or TS amendment.

c. Conclusions

Review and oversight functions required by the TS were acceptably completed by the RAC. Audits of various reactor operations and programs were being conducted. The design change program was comprehensive and satisfied NRC requirements.

3. Radiation Protection

a. Inspection Scope (IP 69012)

The inspector reviewed the following to verify compliance with 10 CFR Part 20 and the applicable licensee TS requirements and procedures:

- MURR dosimetry records for 2005 and 2006
- radiation protection training program records
- Dose Report Review Forms for October 2006 - February 2007
- MURR Reactor Operations Annual Reports for 2005 and 2006
- Selected radiation and contamination survey records for the past year
- MURR Center Security, Emergency, and Health Physics Indoctrination Booklet
- Radiological signs and posting in various facility laboratories and in the Beam Port Floor area
- Calibration and periodic check records for selected radiation survey and monitoring instruments for the past two years
- MURR Procedure AP-HP-105, “Radiation Work Permit,” Rev. 5, issued October 23, 2006, and the associated form, Form FM-17, “Radiation Work Permit”
- MURR Procedure AP-HP-117, “MURR Initial Radiation Worker Training Program,” Rev. 7, issued January 30, 2006, and the associated forms, Form FM-26, “MURR Training Questionnaire,” and Form FM-29, “Initial Training Packet”
- MURR Procedure AP-HP-119, “High Radiation Area Access,” Rev. 1, issued March 24, 2006
- MURR Procedure AP-HP-125, “Review of Unplanned Radiation Exposure,” Rev. 1, issued June 2, 2005
- MURR Procedure IC-HP-300, “Calibration - Radiation Survey Instruments,” Rev. 4, issued March 24, 2006, and the associated form, Form FM-62, “Radiation Instrument Certificate of Calibration”
- MURR Procedure IC-HP-333, “Calibration - Eberline BC-4 Beta Swipe Counter,” Rev. 4, issued January 30, 2006
- MURR Procedure IC-HP-335, “Calibration - Portal Monitor Gamma-60 - S/N 900644,” Rev. 6, issued March 24, 2006
- MURR Procedure OP-HP-220, “Tritium Bioassay,” Rev. 3, issued August 18, 2005
- MURR Procedure RP-HP-100, “Contamination Monitoring - Performing a Swipe,” Rev. 4, issued December 19, 2005
- MURR Procedure RP-HP-120, “Personnel Radioactive Contamination,” Rev. 4, issued March 24, 2006, and the associated forms, Form FM-54, “Report of Personnel Contamination,” and Form FM-76, “Personnel Contamination Log”

- MURR Procedure SV-HP-119, "Property Release," Rev. 2, issued March 24, 2006
- MURR Administrative Policy, POL-3, "MURR Radiation Protection Program," Rev. 6, issued April 19, 2006

The inspector also toured the licensee's facility and witnessed the use of dosimetry and survey meters. Licensee personnel were interviewed as well.

b. Observations and Findings

(1) Surveys

Daily, monthly, and other periodic contamination and radiation surveys, outlined in the licensee's Reactor Operations Annual Report for 2006, were completed by HP staff members. Any contamination detected in concentrations above established action levels was noted and the areas were decontaminated. Results of the surveys were typically documented on survey maps and posted at the entrances of the various areas surveyed so that facility workers would be knowledgeable of the radiological conditions that existed therein.

(2) Postings and Notices

Copies of current notices to workers were posted in appropriate areas in the facility. Radiological signs and survey maps were typically posted at the entrances to controlled areas. Other postings also showed the industrial hygiene hazards that were present in the areas as well. The copies of NRC Form-3 noted at the facility were the latest issue, as required by 10 CFR Part 19, and were posted in various areas throughout the facility such as on the main bulletin board, in main hallways, and at the entrance to the Beam Port Floor area.

(3) Dosimetry and Dose

Through direct observation the inspector determined that dosimetry was acceptably used by facility and contractor personnel. The inspector determined that the licensee used optically stimulated luminescent (OSL) dosimetry for whole body monitoring and thermoluminescent dosimeters (TLDs) in the form of finger rings and wrist badges for extremity monitoring. The dosimetry was supplied and processed by a National Voluntary Laboratory Accreditation Program accredited vendor. An examination of the OSL results indicating radiological exposures at the facility for the past year showed that the highest occupational doses, as well as doses to the public, were within 10 CFR Part 20 limits. The records showed that approximately half of the facility personnel received occupational exposures of zero (0) to only a few millirem above background. The highest annual whole body exposure received by a single individual for 2005 was 1,175 millirem deep dose equivalent (DDE). The highest annual extremity exposure for 2005 was 3,670 millirem shallow dose equivalent (SDE). The highest annual whole body exposure received by a single individual for 2006 was 1,146 millirem DDE and the highest annual extremity exposure for 2006 was 2,510 millirem SDE. Review of exposure records showed that the Reactor Operations group received approximately 60% of the facility's annual dose for 2005 and approximately 58%

of the facility's annual dose for 2006.

The facility also collected and analyzed urine samples for Tritium (H-3) bioassay purposes. The highest attributable dose in 2005 for H-3 was 1 millirem committed effective dose equivalent (CEDE). The highest H-3 attributable dose in 2006 was approximately 11.5 millirem CEDE. This dose in 2006 resulted from the beryllium changeout project which occurred in January.

(4) Radiation Monitoring Equipment

Examination of selected radiation monitoring equipment indicated that the instruments had the acceptable up-to-date calibration sticker attached. The instrument calibration records indicated that the calibration of certain portable survey meters (friskers) was typically completed by licensee staff personnel. Other instruments, such as high range ion chambers and neutron detectors that could not be calibrated by the licensee, were shipped to vendors for calibration. Calibration frequency met procedural requirements and records were maintained as required. Area Radiation Monitors (ARMs) and stack monitors were also being calibrated as required. These monitors were typically calibrated by licensee staff personnel.

(5) Radiation Work Permit Program

The inspector reviewed selected Radiation Work Permits (RWPs) that had been written, used, and closed out during 2006 and the first part of 2007. It was noted that the instructions specified in MURR Procedure AP-HP-105, Attachment 7.1, and those on the associated forms (Form FM-17, "Radiation Work Permit Instructions") had been adequately followed. Appropriate review by management and health physics personnel had been completed. The controls specified in the RWPs were acceptable and applicable for the type of work being done.

(6) Radiation Protection Training

The inspector reviewed the training given to MURR staff members, to those who are authorized to use the experimental facilities of the reactor, to students, and to visitors. The training satisfied the requirements of 10 CFR Part 19 and the training program was acceptable. It was noted that the annual refresher training for all staff personnel had been conducted during the months of September through November 2006.

(7) Radiation Protection Program

The licensee's Radiation Protection and ALARA programs were established and described in the MURR Administrative Policy, POL-3, "MURR Radiation Protection Program," and through the various HP procedures that had been reviewed and approved. The programs contained instructions concerning organization, training, monitoring, personnel responsibilities, and audits. The programs, as outlined and established, appeared to be acceptable. The inspector verified that annual reviews of the Radiation Protection Program were being

completed by the licensee as required by 10 CFR Part 20. The ALARA program, which was consistent with the guidance in 10 CFR Part 20, provided instructions to and guidance for keeping doses as low as reasonably achievable.

(8) MURR ALARA Program

In 2000, the licensee's total cumulative facility dose was 46.7 rem. The Manager of Health Physics and the HP staff, along with other MURR managers and group leaders, recognized that improvements could be made in this area. Consequently, each group established an ALARA goal for the coming year and the facility dose was tracked by group, as well as for each individual. With emphasis placed on achieving the various groups' ALARA goals, the facility dose in 2001 was 42.9 rem. Due to the establishment of aggressive ALARA goals, continued efforts on dose reduction, worker awareness, and engineered improvements, the facility dose was 34 rem in 2002, 26.9 rem in 2003, and 27 rem in 2004. In 2005, preparations began for two major projects that were planned for 2006. As a result, the facility dose in 2005 was 30.7 rem.

In 2006, the licensee successfully complete two major tasks including the replacement of the beryllium reflector and the removal and replacement of two primary reactor heat exchangers. Even though the facility dose increased, the total cumulative dose was held to 33.8 rem, less than the annual dose received in 2000, 2001, and 2002. MURR management and staff are to be commended for their efforts to maintain their doses ALARA.

(9) Facility Tours

The inspector toured the Hot Cell area, Beam Port Floor area, and selected support laboratories with licensee representatives on various occasions. The inspector noted that facility radioactive material storage areas were properly posted. No unmarked radioactive material was noted. Radiation and High Radiation Areas were posted as required and properly controlled.

c. Conclusions

The inspector determined that the Radiation Protection and ALARA Programs, as implemented by the licensee, satisfied regulatory requirements because: 1) surveys were completed and documented acceptably to permit evaluation of the radiation hazards present; 2) postings met regulatory requirements; 3) personnel dosimetry was being worn as required and recorded doses were within the NRC's regulatory limits; 4) radiation survey and monitoring equipment was being maintained and calibrated as required; 5) the Radiation Protection Program was acceptable and was being reviewed annually as required; and, 6) the radiation protection training program was acceptable.

4. Effluent and Environmental Monitoring

a. Inspection Scope (IP 69004)

The inspector reviewed the following to verify compliance with the requirements of 10 CFR Part 20 and TS Section 3.7:

- MURR Reactor Operations Annual Reports for 2005 and 2006
- Monthly ALARA Environmental Review Reports for 2006 and to date in 2007
- Liquid Batch Release Review Forms for 2006 associated with the Monthly ALARA Environmental Review Reports
- the environmental monitoring program outlined through various procedures
- MURR Procedure IC-HP-310, "Calibration - Eberline Model PING 1A Stack Monitor - Particulate Channel," Rev. 4, issued February 10, 2006
- MURR Procedure IC-HP-311, "Calibration - Eberline Model PING 1A Stack Monitor - Iodine Channel," Rev. 4, issued February 10, 2006
- MURR Procedure IC-HP-312, "Calibration - Eberline Model PING 1A Stack Monitor - Gas Channel," Rev. 4, issued February 10, 2006
- MURR Procedure OP-HP-200, "Air Sampling - Containment Building Tritium," Rev. 2, issued November 7, 2006
- MURR Procedure OP-HP-221, "Environmental Sample - Analysis," Rev. 4, issued March 24, 2006
- MURR Procedure OP-HP-222, "Air Sampling - Containment Building Ar-41," Rev. 3, issued March 12, 2007
- MURR Procedure OP-HP-353, "Waste Tank Sample - Analysis," Rev. 3, issued September 16, 2005
- MURR Procedure SV-HP-121, "Building Exhaust Stack Effluent - Ar-41 Monitoring," Rev. 2, issued March 24, 2006

b. Observations and Findings

The inspector determined that gaseous releases continued to be monitored as required, were acceptably analyzed, and were documented in the annual operating reports. Airborne concentrations of gaseous releases were well within the concentrations stipulated in 10 CFR 20, Appendix B, Table 2, and TS limits. The dose rate to the public, as a result of the gaseous releases, was below the dose constraint specified in 10 CFR 20.1101(d) of 10 millirem per year. COMPLY code results indicated an annual dose to the public of 4.1 millirem for 2005, before an occupancy factor was applied. Data for 2006 indicated an annual dose to the public of 10.5 millirem before application of an occupancy factor. (It was noted that the licensee had added 6.6 millirem to the 3.9 millirem calculated by using the COMPLY code. This was done to be conservative and to compensate for an environmental TLD reading of a TLD that was located at the nearest occupied building 150 meters to the northeast of MURR.) By applying an occupancy factor for each year (occupancy factor of 0.24), the resulting annual dose to the public for 2005 was 0.98 millirem and for 2006 the annual dose to the public was 2.54 millirem.

The liquid releases from the facility to the sanitary sewer also continued to be monitored as required, were acceptably analyzed, and were documented in the annual reports. The inspector noted that the results were within the limits specified in 10 CFR 20, Appendix B, Table 3.

Environmental soil, water, and vegetation samples were collected, prepared, and

analyzed consistent with procedural requirements. On-site and off-site gamma radiation monitoring was completed using the reactor facility stack effluent monitor and various environmental TLDs in accordance with the applicable procedures as well. Review of the data indicated that there were no measurable doses above any regulatory limits. The highest unrestricted area dose was measured in an unoccupied area approximately 300 meters east northeast from the MURR stack and read 31.3 millirem for 2006.

c. Conclusion

Effluent monitoring satisfied license and regulatory requirements and releases were within the specified regulatory and TS limits.

5. Transportation

a. Inspection Scope (IP 86740)

To verify compliance with regulatory and procedural requirements for transferring or shipping licensed radioactive material, the inspector reviewed the following:

- selected records of various types of radioactive material shipments
- selected training records for staff personnel authorized to ship hazardous material in accordance with the regulations specified by the DOT, IATA, and ICAO
- MURR Procedure AP-SH-001, “Administrative Procedure, Radioactive Materials Shipping,” Rev. 5, issued February 16, 2007
- MURR Procedure BPB-SH-002, “20WC-1 Packaging and Shipment of Type B Non-Waste Radioactive Material,” Rev. 7, issued September 1, 2006
- MURR Procedure BPB-SH-005, “DOT 6M Packaging and Shipment of Type B Non-Waste Radioactive Material,” Rev. 4, issued September 20, 2006
- MURR Procedure BPB-SH-008, “Type B(U) F-327 Series Packaging of Type B Non-Waste Radioactive Material,” Rev. 4, issued September 20, 2006
- MURR Procedure BP-SH-007, “F-327 Packaging and Shipment of Type A Non-Waste Radioactive Material,” Rev. 2, issued June 16, 2006
- MURR Procedure BP-SH-010, “Packaging and Shipment of Non-Waste Radioactive Materials in Excepted Packages,” Rev. 2, issued October 31, 2006
- MURR Procedure BP-SH-011, “Shipment of Non-Waste DOT 7A Type A (Gemstore) Radioactive Material Package,” Rev. 3, issued October 31, 2006
- MURR Procedure BP-SH-013, “Packaging and Shipment of Radioactive Material Using MURR Reusable Type A Package,” Rev. 1, issued April 17, 2006
- MURR Procedure BP-SH-014, “Packaging and Shipment of Radioactive Material Using an Overpack,” Rev. 0, issued March 7, 2006
- MURR Procedure BP-SH-052, “Radioactive Material Shipment Package Documentation and Labeling,” Rev. 0, issued June 16, 2006
- MURR Procedure BP-SH-099, “Packaging of Radioactive Material Using MURR Model 1500,” Rev. 1, issued February 16, 2007
- MURR Procedure WMB-SH-005, “Shipment of Type B Radioactive Waste Using Chem-Nuclear System 1-13G Cask,” Rev. 4, issued September 1, 2006
- MURR Procedure WM-SH-011, “Shipment of Radioactive Material, Hot Cell Host Cans Waste,” Rev. 2, issued January 11, 2006

- MURR Procedure WM-SH-100, "Radioactive Waste - Preparation and Storage," Rev. 3, issued June 1, 2005
- MURR Procedure WM-SH-300, "MURR Exclusive Use Shipment of LSA or SCO Radioactive Waste," Rev. 3, issued August 18, 2006

b. Observations and Findings

During the inspection, the inspector closely observed the preparations for a shipment of radioactive material from the facility. The inspector observed as the material was moved from the Hot Cell to the shielded shipping container. The container was subsequently surveyed, classified as Yellow-III, and placed in a Type A package. Labels were applied to the package and shipping papers were prepared. The inspector verified that the shipping papers contained the appropriate information and that the appropriate markings were placed on the outside of the package. Proper techniques were followed in conducting surveys of the package and the quality assurance checks of the shipments. The staff conducting these shipments were knowledgeable of their duties and conducted a thorough review of all documentation.

During the aforementioned observations, the inspector also verified that the licensee maintained copies of shipment recipients' licenses to possess radioactive material as required and that the licenses were verified to be current prior to initiating a shipment. The training of the staff members responsible for shipping the material was also reviewed. The inspector verified that the shippers' had had training covering the Department of Transportation (DOT) and IATA requirements.

Through records review and discussions with licensee personnel, the inspector determined that the licensee had shipped spent fuel and other types of radioactive material since the previous inspection in this area. The records indicated that the radioisotope types and quantities were calculated and dose rates measured as required. All radioactive material shipment records reviewed by the inspector had been completed in accordance with DOT and NRC regulations.

c. Conclusions

Radioactive material was being shipped in accordance with the applicable regulations.

6 Exit Interview

The inspection scope and results were summarized on March 22, 2007, with members of licensee management and staff. The inspector described the areas inspected and discussed in detail the inspection findings. The licensee did not identify any of the material provided to or reviewed by the inspector during the inspection as proprietary. No dissenting comments were received from the licensee.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

M. Ballew, Health Physics Technician II
K. Brooks, Associate Director, Product and Service Operations
R. Butler, Director of MURR
M. Diaz de Leon, Health Physicist
R. Dobey, Health Physics Manager
J. Ernst, Associate Director, Regulatory Assurance Group
L. Foyto, Reactor Manager
A. Gaddy, Compliance Specialist
M. Kilfoil, Shipping and Hot Cell Manager
K. Kutikkad, Assistant Reactor Manager, Physics
R. Maxey, Health Physics Technician Specialist/Shipping
W. Meyer, Chief Operating Officer
M. Nichols, Health Physics Technician/Shipping
D. Nickolaus, Health Physics Technician
N. Pearson, Health Physics Technician/Shipping

INSPECTION PROCEDURES USED

IP 69004:	Class 1 Research and Test Reactor Effluent and Environmental Monitoring
IP 69006:	Class 1 Research and Test Reactor Organization, Operations, and Maintenance Activities
IP 69007:	Class 1 Research and Test Reactor Review and Audit and Design Change Functions
IP 69012:	Class 1 Research and Test Reactor Radiation Protection
IP 86740:	Inspection of Transportation Activities

OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

None

LIST OF ACRONYMS USED

ARM	Area Radiation Monitor
ALARA	As low as reasonably achievable
CEDE	Committed effective dose equivalent
CFR	Code of Federal Regulations
DDE	Deep dose equivalent
DOT	Department of Transportation

HP	Health physics
HSR	Hazards Summary Report
IATA	International Air Transport Association
IFI	Inspector Follow-up Item
IP	Inspection Procedure
MURR	University of Missouri - Columbia Research Reactor
NRC	Nuclear Regulatory Commission
OSL	Optically stimulated luminescent (dosimeter)
PDR	Public Document Room
RAC	Reactor Advisory Committee
RWP	Radiation Work Permit
SDE	Shallow dose equivalent
TLD	Thermoluminescent dosimeter
TS	Technical Specification