

September 9, 2009

Mr. William E. Bonzer, Reactor Manager
Missouri University of Science and Technology
Nuclear Reactor Facility
1870 Miner Circle
Rolla, MO 65409-0630

SUBJECT: MISSOURI UNIVERSITY OF SCIENCE AND TECHNOLOGY - NRC ROUTINE
INSPECTION REPORT NO.: 50-123/2009-202

Dear Mr. Bonzer:

On August 17-19, 2009, the U.S. Nuclear Regulatory Commission (NRC, the Commission) conducted an inspection at your Nuclear Reactor Facility (Inspection Report No. 50-123/2009-202). The enclosed report documents the inspection results, which were discussed on August 19, 2009 with members of your staff.

Areas examined during the inspection are identified in the report. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations of activities in progress. Based on the results of this inspection, no safety concerns or non-compliances with NRC requirements were identified. No response to this letter is required.

In accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public inspections, exemptions, and requests for withholding," a copy of this letter and its enclosure 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 (Agencywide Documents Access and Management System (ADAMS)). ADAMS is accessible from the NRC Web site at (the Public Electronic Reading Room) <http://www.nrc.gov/reading-rm/adams.html>.

If you have any questions concerning this inspection, please contact Patrick J. Isaac at 301-415-1019 or Patrick.Isaac@nrc.gov.

Sincerely,

/RA/

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

Docket No.: 50-123
License No.: R-79

Enclosure: NRC Inspection Report No.: 50-123/2009-202
cc w/encl: Please see next page

Missouri University of Science and Technology

Docket No.: 50-123

cc:

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

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

Docket No: 50-123

License No: R-79

Report No: 50-123/2009-202

Licensee: Missouri University of Science and Technology

Facility: Nuclear Reactor Facility

Location: Rolla, Missouri

Dates: August 17-19, 2009

Inspectors: Patrick J. Isaac
Mike Morlang (Trainee)

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

EXECUTIVE SUMMARY

Missouri University of Science and Technology
Report No.: 50-123/2009-202

The primary focus of this routine, announced inspection, was the on-site review of selected aspects of the licensee's Class II research reactor facility safety program including operating logs and records, requalification training, surveillance and limiting conditions for operations, emergency planning, maintenance logs and records and fuel handling logs and records. The licensee's programs were acceptably directed toward the protection of public health and safety, and in compliance with NRC requirements.

Operations Logs and Records

- Operating logs and records were being maintained in accordance with Technical Specification (TS) Section 6.8, Records.

Requalification Training

- The licensee's reactor operator requalification program was found to be effectively implemented pursuant to Title 10 of the *Code of Federal Regulations* Part 55.

Surveillance and Limiting Conditions for Operation

- The licensee was complying with the TS requirements pertaining to surveillance and limiting conditions for operation.

Emergency Planning

- The emergency preparedness program was being implemented and conducted in accordance with the facility Emergency Plan.

Maintenance Logs and Records

- The licensee was meeting TS requirements pertaining to preventative and corrective maintenance of equipment.

Fuel Handling Logs and Records

- The licensee was conducting fuel handling activities and maintaining records in a manner consistent with regulatory and license requirements.

REPORT DETAILS

Summary of Plant Status

The Missouri University of Science and Technology 200 kW pool-type research reactor continues to be operated in support of graduate and undergraduate instruction, laboratory experiments, reactor operator training, and various forms of research. During the inspection, the reactor was started-up, operated, and shut down.

1. Operations Logs and Records

a. Inspection Scope (IP 69001)

The inspector reviewed the following reactor operations records to ensure compliance with the requirements of technical specification (TS) Section 6.8, Records:

- Reactor Console Logbook #16, from May 21, 2009 to present
- Reactor Console Logbook #15, from March 18, 2007 to May 21, 2009
- MSTR Standard Operating Procedure (SOP) SOP-102, Pre-Startup Checklist, Revised (Rev.) March 5, 2009, October 8, 2008 to present
- MSTR SOP-105, Reactor Shutdown Checklist, Rev. April 14, 1998
- MSTR SOP-107, Permanent Hourly Logs and Operational Data, Rev. January 3, 2008, January 9, 2009 to present
- MSTR Annual Progress Report April 1, 2008 to March 31, 2009
- Note: Additional records required by TS Section 6.8 were reviewed and documented in other sections of this report, namely sections 2. Requalification Training, 3. Surveillance and Limiting Conditions for Operation, 4. Emergency Planning, 5. Maintenance Logs and Records, and 6. Fuel Handling Logs and Records

b. Observations and Findings

Reactor operations were carried out following written procedures and TS requirements. A review of the logs and records indicated that TS operational limits had not been exceeded. The inspector determined that reactor operations were carried out following written procedures. The inspector observed the licensee complete the pre-startup checklist, startup the reactor to 10 watts and shutdown the reactor. Numerous operating procedures had been updated to reflect the new reactor license and TS issued on March 30, 2009.

c. Conclusions

Operating logs and records were being maintained in accordance with TS Section 6.8, Records.

2. **Requalification Training**

a. Inspection Scope (IP 69001)

The inspector reviewed the following to ensure that Title 10 of the *Code of Federal Regulations* (10 CFR) Part 55 requirements for reactor operator requalification were being met:

- Operator Requalification Program for the University of Missouri-Rolla Reactor, Rev. 3, August 20, 2004
- MSTR Requalification Files for Individual Operators
- 2008 MSTR Operator's Requalification Test
- 2008 & 2009 Reactor Operator's Requalification Sheets
- MSTR file of Operator Form NRC-396 for 2008
- MSTR Requalification files for individual operators

b. Observations and Findings

There were three U.S. Nuclear Regulatory Commission (NRC) licensed senior reactor operators (SROs), one reactor operator (RO) and one person in training on staff at the facility. The licensed RO is not currently available and her license is considered inactive. The Requalification Program was maintained up-to-date and SRO licenses were current. A review of the logs and records showed that training was being conducted in accordance with the licensee's NRC-approved requalification and training program. Records of quarterly reactor operations, reactivity manipulations, and other operations activities were being documented as required. Records indicating the completion of the annual operations tests and supervisory observations were also maintained. Biennial written examinations were being completed and documented as required as well. The inspectors also noted that operators were receiving the required biennial medical examinations.

c. Conclusions

Operator requalification was up-to-date and was being performed as required by the MSTR Reactor Operator Requalification Program.

3. **Surveillance and Limiting Conditions for Operation**

a. Inspection Scope (IP 69001)

The inspector reviewed sections of the following documents to verify that periodic surveillance tests stipulated in TS Section 4.0 and limited conditions for operation specified in TS Section 3.0 were being met:

- Reactor Facility Monthly Surveillance Status Report, January 2009 to July 2009
- MSTR SOP 800, Semi-Annual Checklist, May 17, 2008 and January 20, 2009

- MSTR SOP 810, Weekly Checks, Rev. February 27, 2008, August 11, 2008 to present
- Reactor Console Logbook #16, from May 21, 2009 to present
- Reactor Console Logbook #15, from March 18, 2007 to May 21, 2009
- MSTR Annual Progress Report April 1, 2008 to March 31, 2009

b. Observations and Findings

The inspector reviewed a random sample of records documenting that operations had been conducted in accordance with the limiting conditions for operation specified in TS Section 3.0 and that surveillance had been done in compliance with the various TS Section 4.0 requirements. Records were maintained in accordance with the administrative requirements. Logs and records were clear, well organized, readily retrievable, and provided a characterization of licensed activities. The licensee was maintaining a system of scheduling surveillance requirements that aided in timely completion of the various requirements.

c. Conclusions

The licensee was complying with the TS requirements pertaining to surveillance and limiting conditions for operation.

4. **Emergency Planning**

a. Inspection Scope (IP 69001)

To verify that the licensee was implementing and complying with the NRC approved Emergency Plan for the MSTR, the inspector reviewed selected aspects of:

- MSTR Emergency Plan (E-Plan) Rev. 6, dated December 30, 1994
- Annual Review of the MSTR Emergency Plan, December 31, 2008
- Emergency Box Inventory, October 24, 2008 and April 2, 2009
- MSTR SOP-501, Emergency Procedures for Reactor Building Evacuation, Rev. December 19, 2007 (with phone roster last updated January 9, 2008)
- MSTR SOP-503, Emergency Procedures for an Alert, Rev. December 28, 1994
- MSTR SOP-504, Emergency Procedures for a Site Area Emergency, Rev. December 28, 1994
- MSTR SOP-507, Emergency Procedures - Administrative Responsibilities, Rev. January 3, 2008
- MSTR SOP-508, Tornado Threat, Rev. May 13, 1999
- Agreement letters for supporting emergency organizations
- Memorandums from R. Bono to Reactor Emergency Preparedness Support Personnel, "Announcement of Table-top Meeting", dated May 10, 2007, December 18, 2007, May 6, 2008, October 31, 2008, and May 18, 2009

b. Observations and Findings

Through review of evacuation drill records and interviews with reactor and Environmental Health & Safety personnel, the inspector confirmed that emergency response training had been given annually as required by the E-Plan. The inspector confirmed that notification procedures and phone numbers were current. E-Plan support agreements with off-site response organizations (i.e., Fire and Law Enforcement Agencies, local ambulance services, and medical services) were on file. The table-top exercises in 2007 and 2008 were attended by local and state organizations.

Section 10 of the MSTR E-Plan requires that building evacuation drills be held each regular semester. The inspector verified that evacuation drills had been held as required since the last inspection.

c. Conclusions

The emergency preparedness program was being implemented and conducted in accordance with the facility E-Plan.

5. Maintenance Logs and Records

a. Inspection Scope (IP 69001)

To verify compliance with maintenance procedure requirements of TS Section 6.4 (5) and maintenance record requirements of TS Section 6.8.1(2), the inspector reviewed:

- Surveillance file for 2007 and 2008
- Equipment Discrepancy Report files for 2007 and 2008
- Permanent Logbook #15, March 28, 2007 through May 21, 2009
- Permanent Logbook #16, May 21, 2009 to present

b. Observations and Findings

The inspector verified that the licensee maintained maintenance procedures and records pursuant to TS Sections 6.4 (5) and 6.8.1 (2). Preventative maintenance was well controlled and documented in the Surveillance files and the Permanent Logbooks. Corrective/repair maintenance of equipment is documented on Equipment Discrepancy Report forms that are maintained in the equipment history files.

c. Conclusions

Maintenance records and performance satisfied TS and procedural requirements.

6. Fuel Handling Logs and Records

a. Inspection Scope (IP 69001)

To verify compliance with regulatory and license requirements the inspector reviewed:

- MSTR SOP-112, Fuel Management, Rev. February 6, 1997
- Reactor Console Logbook #16 entries regarding fuel movements on August 5, 2009
- LEU Fuel Transfer Forms file

b. Observations and Findings

The inspector reviewed records of fuel movements that were done on the date specified above. The inspector noted that the standard operating procedure required entries on the fuel transfer form and in the console log book each time a fuel element was moved. The inspector noted that one fuel element move had been documented on the fuel transfer form but not in the console log book. This was corrected by the licensee. Serial numbers were verified during fuel moves and a physical inventory was completed following completion of the fuel moves.

c. Conclusion

The licensee was conducting fuel handling activities and maintaining records in a manner consistent with regulatory and license requirements.

7. Exit Interview

The inspection scope and observations were summarized on August 19, 2009, with members of licensee management and staff. The inspector described the areas inspected and discussed in detail the inspection findings. No dissenting comments were received from the licensee.

PARTIAL LIST OF PERSONS CONTACTED

R. Bono, Director of Environmental Health and Safety and Radiation Safety Officer
W. Bonzer, Reactor Operations Manager
M. Henry, Senior Missouri University of Science and Technology Secretary
B. Porter, Senior Electronics Technician/Reactor Health Physicist

INSPECTION PROCEDURE (IP) USED

IP 69001 Class II Non-Power Reactors

ITEMS OPENED, CLOSED, AND DISCUSSED

Open

None

Closed

None

Discussed

None

PARTIAL LIST OF ACRONYMS USED

ALARA	As Low As Reasonably Achievable
CFR	Code of Federal Regulations
E-Plan	Emergency Plan
EH&S	Environmental Health and Safety
HBRO	Handbook of Radiological Operations
HP	Health Physics
IP	Inspection Procedure
IRF	Irradiation Request Form
MSTR	Missouri University of Science and Technology Reactor
NRC	Nuclear Regulatory Commission
RAM	Radiation Area Monitor
Rev	Revision
RO	Reactor Operator
RPP	Radiation Protection Program
RSC	Radiation Safety Committee
SOP	Standard Operating Procedure
SRO	Senior Reactor Operator
TS	Technical Specification