



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

March 2, 2022

Dr. J. David Robertson
Reactor Facility Director
University of Missouri-Columbia
Research Reactor Center
1513 Research Park Drive
Columbia, MO 65211

SUBJECT: THE CURATORS OF THE UNIVERSITY OF MISSOURI – U.S. NUCLEAR
REGULATORY COMMISSION ROUTINE INSPECTION REPORT
NO. 05000186/2021203

Dear Dr. Robertson:

From November 1-4, 2021, the U.S. Nuclear Regulatory Commission (NRC) staff conducted a routine announced safety inspection at the University of Missouri-Columbia Research Reactor facility. The enclosed report presents the results of that inspection.

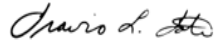
The inspection examined activities conducted under your license as they relate to public health and safety to ensure compliance with the Commission's rules and regulations and with the conditions of your license. The inspector reviewed selected procedures and representative records, observed various activities, and interviewed personnel.

Based on the results of this inspection, the NRC has determined that three Severity Level IV violations of NRC requirements occurred. The violations are being treated as non-cited violations (NCVs), consistent with Section 2.3.2.a of the Enforcement Policy. The NCVs are described in the subject inspection report. If you contest the violations or significance of the NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001, with copies to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

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

If you have any questions concerning this inspection, please contact Craig Bassett at (240) 535-1842, or by electronic mail at Craig.Bassett@nrc.gov.

Sincerely,



Signed by Tate, Travis
on 03/02/22

Travis L. Tate, Chief
Non-Power Production and Utilization Facility
Oversight Branch
Division of Advanced Reactors and Non-Power
Production and Utilization Facilities
Office of Nuclear Reactor Regulation

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

Enclosure:
As stated

cc: See next page

University of Missouri-Columbia

Docket No. 50-186

cc:

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Test, Research and Training
Reactor Newsletter
Attention: Amber Johnson
Dept of Materials Science and Engineering
University of Maryland
4418 Stadium Drive
College Park, MD 20742-2115

SUBJECT: UNIVERSITY OF MISSOURI-COLUMBIA – U.S. NUCLEAR REGULATORY
COMMISSION ROUTINE INSPECTION REPORT NO. 05000186/2021203
DATED: MARCH 2, 2022

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

Docket No.: 50-186

License No.: R-103

Report No.: 05000186/2021203

Licensee: The Curators of the University of Missouri

Facility: University of Missouri-Columbia Research Reactor

Location: Columbia, Missouri

Dates: November 1-4, 2021

Inspector: Craig Bassett

Accompanied by: Geoffrey Wertz, Project Manager
Molly-Kate Gavello, Project Manager

Approved by: Travis L. Tate, Chief
Non-Power Production and Utilization Facility
Oversight Branch
Division of Advanced Reactors and Non-Power
Production and Utilization Facilities
Office of Nuclear Reactor Regulation

Enclosure

EXECUTIVE SUMMARY

The Curators of the University of Missouri
University of Missouri-Columbia Research Reactor
Inspection Report No. 05000186/2021203

The primary focus of this routine, announced safety inspection included the onsite review of selected aspects of the Missouri University Research Reactor (MURR) facility safety program, including: (1) operator licenses, requalification, and medical examinations; (2) experiments; (3) organization and operations and maintenance activities; (4) review and audit and design change functions; (5) procedures; (6) fuel movement; (7) surveillance; and (8) reportable event follow-up. The U.S. Nuclear Regulatory Commission (NRC) staff determined the licensee's program was acceptably directed toward the protection of public health and safety, and in compliance with the NRC requirements.

Operator Licenses, Requalification, and Medical Examinations

- Operator training and requalification, as well as medical examinations, were completed as required by regulations and the requalification program.

Experiments

- The program for reviewing, changing, and conducting experiments satisfied technical specifications (TSs) and current procedural requirements.

Organization and Operations and Maintenance Activities

- Organization and staffing were in compliance with the TS requirements.
- Operations were conducted in accordance with procedures, appropriate logs were maintained, and the work control program was used for timely and effective completion of maintenance activities.

Review and Audit and Design Change Functions

- Review, audit, and oversight functions required by the TSs were completed by the Reactor Advisory Committee (RAC) as required by the TSs.
- Changes to the facility were evaluated using the criteria specified in Title 10 of the *Code of Federal Regulations* (10 CFR) 50.59, "Changes, tests and experiments," and were reviewed and approved when required.

Procedures

- The procedure review, revision, control, and implementation program satisfied TS requirements.

Fuel Movement

- Fuel movements and inspections were conducted in accordance with TS and procedural requirements.

Surveillance

- Surveillance activities at the facility were completed within the TS-prescribed time frames.

Event Follow-up

- One previously identified Inspector Follow-up Item (IFI) was closed. Three event notifications/reports were reviewed and closed as well.

REPORT DETAILS

Summary of Facility Status

The University of Missouri-Columbia continued to operate the 10 megawatt research reactor in support of isotope production, irradiation services, research, education, and training.

1. Operator Licenses, Requalification, and Medical Examinations

a. Inspection Scope (Inspection Procedure (IP) 69003)

The inspector reviewed the following to verify that the requirements of 10 CFR Part 55, "Operators' Licenses," were met:

- list of NRC licensed operators for MURR
- results of the biennial licensed operator requalification exam for 2021
- results of the 2020 annual operating test records for licensed operators
- various reports and logs documenting operators' completion of licensed activities
- NRC Form 396, "Certification of Medical Examination by Facility Licensee," for licensed operators
- "Operator Requalification Program, University of Missouri Research Reactor (MURR)" submitted January 7, 1997
- MURR Administrative Procedure (AP), AP-RO-105, "MURR Operator Requalification Process," Revision (Rev.) 1 dated October 4, 2019

b. Observations and Findings

The inspector found that there were 10 senior reactor operators (SROs) and 10 reactor operators (ROs) currently licensed at MURR. In addition, there were five individuals in the operator training program. The inspector's review confirmed that licensed SROs and ROs met the requalification program requirements for maintaining their licenses in active status. The inspector also confirmed that examination records documented the adequacy of licensee administered examinations. The inspector verified that the licensee implemented the operator requalification program as approved by the NRC.

The inspector also verified that operators' licenses were current and were renewed as required by 10 CFR 55.57, "Renewal of licenses." The inspector verified that the operators received biennial medical examinations as required by the regulations.

c. Conclusion

The inspector determined that operator training, requalification, and medical examinations were conducted as required by the MURR Requalification Program and NRC regulations.

2. Experiments

a. Inspection Scope (IP 69005)

The inspector reviewed the licensee's program for conducting experiments and selected aspects of the following to verify compliance with TSs 3.8 and 6.5:

- listing of current experiments
- various reactor utilization request proposal and evaluation packages
- "RUR Summary Sheets Manual" listing summaries of experiments that can be performed in the "Flux Trap or All Positions" or in the "Reflector Only"
- MURR 2019 Reactor Operations Annual Report
- MURR 2020 Reactor Operations Annual Report

b. Observations and Findings

The inspector found that experiments conducted at the facility were required to be evaluated and reviewed using MURR AP-RO-135, "Reactor Utilization Requests." The inspector noted that the procedure required different types of approval depending on the class of the experiment and whether the experiment required further review pursuant to 10 CFR 50.59. The inspector verified that the experiments were reviewed and approved as required by procedure.

The inspector confirmed that the experiments in progress during the inspection were conducted under the cognizance of the reactor manager and the licensed SRO, and in accordance with TS requirements (e.g., thermal, corrosive, reactivity limitations, etc.). The materials produced during the experiments were handled and transferred as required by TSs and licensee procedures.

c. Conclusion

The inspector determined that the program for reviewing, approving, and conducting experiments satisfied TS and procedural requirements.

3. Organization and Operations and Maintenance Activities

a. Inspection Scope (IP 69006)

To verify compliance with the licensee's TS requirements, the inspector reviewed selected aspects of the licensee's organization, operations, and preventative maintenance program, including:

- current MURR facility staffing
- current TSs for the facility
- selected compliance check procedures
- facility annual reports for the past 2 years
- various MURR control room logbooks from 2020-2021
- selected preventive and special maintenance procedures
- selected records for maintenance activities performed in 2020 and to date in 2021

- various MURR procedures including: MURR Administrative Procedure, AP-RR-001, "Corrective Action Program," Rev. 14; MURR Operating Procedure, AP-RO-110, "Conduct of Operations," Rev. 29; and MURR Operating Procedure, OP-RO-220, "Reactor Shutdown or Power Reduction," Rev. 14
- selected corrective action program (CAP) records including CAP Summary Reports issued quarterly for October – December 2020 and January – March, April – June, and July – September 2021

b. Observations and Findings

(1) Organization and Staffing

The inspector found the organizational structure at the facility remained unchanged since the last inspection. Through the review and the observation of operating shifts, the inspector confirmed that staffing during reactor operations consisted of at least two facility staff personnel (one SRO/RO and one knowledgeable individual) in accordance with TS 6.1.c.

(2) Operations

During the inspection, the inspector observed various activities, including a reactor start-up on Monday evening following a routine shutdown. The inspector observed that written procedures and checklists were used for operations activities as required by TSs. The inspector also attended an evening operations crew shift turnover meeting. During the inspection, there was a loss of power for the reactor facility. The inspector noted that the crew handled the situation and followed the procedure that was developed for the loss of power condition. The inspector noted staff members were knowledgeable and professional in the conduct of their duties and adhered to procedures.

(3) Maintenance

The inspector verified that specific maintenance and compliance check procedures were used by the licensee to document the results of the work that was completed. The inspector confirmed that equipment was monitored and maintained as required by TSs.

(4) Corrective Action Program

The licensee's CAP was developed to provide staff members with a formal process to identify deficiencies and bring safety issues to management's attention for resolution. Based on a review of a sample of CAP documents, the inspector verified that the licensee's program to identify and record issues, and the corrective actions taken, was an effective method to resolve deficiencies and safety concerns at MURR.

c. Conclusion

The inspector determined that the organization and staffing were in compliance with the TS requirements; operations were conducted in accordance with the TSs and procedures; maintenance was conducted as required by TSs; and the licensee's CAP assisted in resolving safety concerns.

4. Review and Audit and Design Change Functions

a. Inspection Scope (IP 69007)

To verify compliance with the licensee's TS requirements for conducting reviews and audits and 10 CFR 50.59 evaluations, the inspector reviewed selected aspects of the licensee's program, including:

- current TSs for the facility
- facility annual reports for the past 2 years
- "50.59 Screens," for 2020 and to date in 2021
- various modification records for 2020 and 2021
- meeting minutes from October 2020 through October 2021 for the RAC; Reactor Safety Subcommittee; Reactor Safety Procedure Review Subcommittee; Isotope Use Subcommittee; and Isotope Use Procedure Review Subcommittee

b. Observations and Findings

(1) Review and Audit Functions

The inspector found the composition of the RAC was as specified in TS 6.2.a. The inspector also found that the committee (or subcommittees) met as required by TS 6.2.b, and provided the reviews as specified in TS 6.2.a. The inspector noted that topics of the reviews were as required by TSs and provided independent oversight to ensure safe operations of the reactor. Based on records review and interviews, the inspector verified the 2020 audits pertaining to Facility Operations, Operator Requalification Program, Corrective Action items, and emergency plan were completed as required by TS 6.2.e(1)i-iv.

(2) Design Change Function

To satisfy the regulatory requirements stipulated in 10 CFR 50.59, the inspector noted that the licensee established a design change review program which was implemented through MURR procedures AP-RR-003 and AP-RO-115. The inspector confirmed that the program included screening and safety reviews of changes, tests, or experiments to determine if, pursuant to 10 CFR 50.59, a change required the NRC's approval prior to implementation. The inspector confirmed that the licensee was adhering to the procedures and regulations which guided the review process.

c. Conclusion

The inspector determined that review, audit, and oversight functions required by the TS were completed. The inspector also determined that changes to the facility were evaluated using the criteria specified in 10 CFR 50.59, and were reviewed and approved as required by procedure.

5. Procedures

a. Inspection Scope (IP 69008)

To verify compliance with the licensee's TS requirements for procedures, the inspector reviewed selected aspects of the licensee's program, including:

- current TSs for the facility
- facility annual reports for the past 2 years
- status of completed FM-5 reviews for operations procedures
- FM-5, "Facility-Controlled Document Revision and Annual Review Form," Rev. 21

b. Observations and Findings

The inspector reviewed the process to review, approve, and change procedures. The inspector noted that facility procedures were developed for the operation of the reactor, as required by TS 6.4.a. The inspector found that all operations procedures were reviewed and approved by the Reactor Manager as required by TS 6.4.c. Through observations during the inspection, the inspector confirmed that operations were conducted in accordance with approved procedures.

c. Conclusion

The inspector determined that the procedure review, revision, control, and implementation program satisfied TS requirements.

6. Fuel Movement

a. Inspection Scope (IP 69009)

To verify compliance with the licensee's TS requirements regarding MURR fuel, the inspector reviewed selected aspects of the licensee's program, including:

- current TSs for the facility
- MURR control room logbooks for 2021
- "Fuel Location Maps," for Cores 21-01 through 21-47
- completed FM-08 forms, "Fuel Movement Sheet," for Cores 21-01 through 21-47

b. Observations and Findings

The inspector reviewed the fuel movement process and observed core refueling operations during the inspection. The inspector verified that the licensee moved fuel according to established procedures and selected fuel movement sheets as required by TSs. The inspector confirmed that fuel handling tools were maintained and were secured when not in use. The inspector also compared the current location of selected fuel elements in the reactor core (as illustrated by a printed core configuration map) with the information maintained on the fuel status boards in the control room and on the fuel movement sheets. The inspector verified that fuel was inspected and used and stored in the required and approved locations.

c. Conclusion

The inspector determined that fuel movements and inspections were conducted in accordance with TS and procedural requirements.

7. Surveillance

a. Inspection Scope (IP 69010)

To verify compliance with the licensee's TS requirements for surveillances, the inspector reviewed selected aspects of the licensee's program, including:

- current TSs for the facility
- MURR control room logbooks for 2020 and 2021
- facility annual reports for the past 2 years
- completed compliance check procedures
- select records documenting completed compliance checks for 2020 and 2021

b. Observations and Findings

The inspector verified that routine maintenance and surveillance activities including verifications, calibrations, and testing of various reactor systems, instrumentation, auxiliary systems, and security systems and alarms, were completed by the licensee during routine shutdowns for reactor refueling. The inspector noted records documented that the required tests, checks, verifications, and calibrations were completed on schedule and in accordance with licensee procedures. The results of the completed check procedures reviewed by the inspector were found to be within the TS and procedurally prescribed parameters.

c. Conclusion

The inspector determined that surveillance activities at the facility were completed within the TS-prescribed time frames and parameters.

8. Follow-up

a. Inspection Scope (IP 92701)

The inspector reviewed the licensee's actions taken in response to an Inspector Follow-up Item (IFI) and three Licensee Event Notifications/Reports including:

- Letter from the licensee to the NRC regarding a reportable event pursuant to 10 CFR 20.2203(a)(2)(iv), dated August 5, 2021
- Letter from the licensee to the NRC regarding a deviation from TS 3.2.a, dated August 9, 2021 (NRC Event No. 55380)
- Letter from the licensee to the NRC regarding an abnormal occurrence, dated October 25, 2021 (NRC Event No. 55516)

b. Observations and Findings

- (1) 05000186/2020-202-02 – IFI – Follow-up on the completion of all the corrective actions identified following the new fuel damage event of August 23, 2020.

On the evening of August 23, 2020, a MURR reactor operations crew was transferring two fresh fuel elements from storage to the reactor pool area. As the crew lowered one of the new fuel elements into the reactor pool storage location, the rope that was used became caught in the fuel element roller gap. The operations crew attempted to correct the problem but eventually the fuel element was dropped and damaged in the process. During an inspection in November 2020, the inspector reviewed the actions taken by the licensee in response to this event which included fabricating a new basket for lowering the fuel into the pool and revising the fuel handling procedure. The licensee also required a Reactor Operations Manager to be present during future fuel movements and additional training for all reactor operators and managers. All the corrective actions noted above was not completed at the time of the inspection in November 2020 so an IFI was opened to review the actions during a future inspection.

During this inspection, the inspector reviewed this issue with the licensee and the corrective actions taken. The inspector noted that a new basket for lowering the fuel into the pool was fabricated and the fuel handling procedure was revised. The inspector verified that a Reactor Operations Manager is present during fuel movements and additional training for all reactor operators and managers were conducted. The inspector confirmed that corrective actions identified by the licensee were completed. This issue is considered closed.

- (2) Reportable Event Report Pursuant to 10 CFR 20.2203(a)(2)(iv)

On July 14, 2021, a health physics technician (HPT) was performing a routine survey of the loading dock area external to the MURR industrial building. The HPT noticed a slightly elevated radiation level in the area of the building above head level. To complete a detailed survey, the HPT retrieved a ladder and completed a survey at about 10-12 feet above ground level. The HPT found the dose rate was 20 millirem per hour on contact with the external wall of the building which was more than the 2 millirem per hour limit for a member of the public stipulated in 10 CFR 20.1301, "Dose limits for individual members of the public," paragraph (a)(2). The licensee

determined that this was a Reportable Event pursuant to 10 CFR 20.2203, "Reports of exposures, radiation levels, and concentrations of radioactive material exceeding the constraints or limits," paragraph (a) and issued a report to the NRC on August 5, 2021.

During this inspection, the inspector reviewed this event and the licensee's actions in response to the higher-than-expected radiation levels. The inspector found that following the initial survey, the licensee determined that the higher radiation levels only existed on the days when quality control processing of Iodine-131 (I-131) occurred. During the following week, as part of their investigation of this situation, MURR also performed similar surveys at elevated levels along the exterior of the MURR industrial building in areas where other processes were conducted. On July 21, 2021, one area at a height of about 15 feet was noted to exhibit radiation levels of 30 millirem per hour, again a level above the 10 CFR 20.1301(a)(2) limit. This was the lutetium-177 (Lu-177) autoclave suite.

The licensee entered this problem into the CAP and took various corrective actions in response to this event. Additional shielding was added to these process areas to reduce the radiation levels exterior to the building. In addition to the shielding, the licensee reviewed the entry logs for the facility and concluded that no member of the public was exposed at any time due to the dose external to the building. Procedures regarding iodine and lutetium processing were revised. Members of the I-131 quality control and Lu-177 autoclave teams and HPT staff were given supplemental training regarding shielding configuration, area postings, and the procedures that were revised. The inspector reviewed the licensee's corrective actions and found that the actions were completed.

The licensee was informed that the failure to maintain the dose in any unrestricted area from external sources to less than 2 millirem in any one hour was a Severity Level IV violation of 10 CFR 20.1301(a)(2). As indicated above, the inspector determined that the problem was identified by the licensee, reported to the NRC, and entered into the CAP. The inspector determined that corrective actions were identified and completed as well. As a result, the licensee was informed that this non-willful, non-repetitive, licensee-identified, and licensee-corrected violation would be treated as an NCV, consistent with Section 2.3.2.a of the NRC Enforcement Policy (NCV 05000186/2021203-01). This issue is considered closed.

(3) Non-compliance with a Limiting Condition of Operations required by TSs 3.2.a

On July 27, 2021, the licensee notified the NRC of a non-compliance with a Limiting Condition for Operations (LCO). TS 3.2.a states that "[a]ll control blades, including the regulating blade, shall be operable during reactor operation." The NRC recorded this issue as Event Number (#) 55380. The licensee subsequently issued a report to the NRC concerning this event dated August 9, 2021.

During this inspection, the inspector reviewed this event and the licensee's corrective actions. The inspector found that on July 26, 2021, while the reactor was subcritical during a reactor startup, the reactor was manually shut down due to the failure of the control rod drive mechanism (CRDM) for shim control blade B. At that point, with the reactor shut down, the CRDM for shim control blade B was removed from service.

The licensee determined cause of the problem and a spare CRDM was installed. The CRDM was tested for operability and proved to be satisfactory. The Reactor Facility Director was informed of the situation and operators requested permission to return the reactor to operation as required by TSs. Later that day the reactor was returned to service. The inspector reviewed the event and the licensee's actions. The inspector found that the licensee's actions were complete and in accordance with facility procedures and the TSs.

The licensee was informed that the failure to maintain the shim control blade B operable while the reactor was in operation was a Severity Level IV violation of TS 3.2.a. As indicated above, the inspector determined that the problem was identified by the licensee and reported to the NRC. Corrective actions were identified and completed as well. As a result, the licensee was informed that this non-willful, non-repetitive, licensee-identified and licensee-corrected violation would be treated as an NCV, consistent with Section 2.3.2.a of the NRC Enforcement Policy (NCV 05000186/2021203-02). This issue is considered closed

(4) Abnormal Occurrence requiring notification of the NRC pursuant to TS 6.6.c(1)

On October 12, 2021, pursuant to TS 6.6.c(1), the licensee notified the NRC of an abnormal occurrence at the facility. This was noted by the NRC as Event # 55516. The licensee subsequently issued a report to the NRC concerning this event dated October 25, 2021.

During this inspection, the inspector reviewed this event and the licensee's corrective actions. The inspector found that on October 11, 2021, the licensee discovered a noncompliance with the LCO in TS 3.2.g.6, involving one primary coolant low pressure instrument channel scram setpoint. While the reactor was shut down for maintenance and testing, a surveillance test revealed that the reactor core outlet pressure channel associated with pressure transmitter 994B did not provide a reactor scram at the TS low pressure setpoint. The safety instrument channel 944B scram setpoint was calculated to be 74.43 pounds per square inch absolute (psia), slightly below the required 75 psia minimum. Following discovery of this problem, the licensee conducted troubleshooting on instrument channel 944B and found that one component caused the setpoint deviation. The licensee replaced that component with an exact spare and the instrument channel was retested and documented to be back in compliance with TS-required setpoint. Following testing, the Reactor Facility Director authorized the reactor to return to operation in accordance with TSs.

The inspector reviewed the event and the licensee's actions. The inspector noted that the licensee was bench testing the component that caused the setpoint deviation. This test was going to last for up to 12 months to try and determine the cause of the component malfunction. The inspector found that the licensee's actions in restarting the reactor were in accordance with facility procedures and the TSs. However, since the component was to be tested for a lengthy period of time, follow-up on the results of the bench testing will be identified as a follow-up item (IFI 05000186/2021203-03).

The licensee was informed that the failure of the reactor core outlet pressure channel associated with pressure transmitter 994B to provide a reactor scram at the TS low pressure setpoint was a Severity Level IV violation of TS 3.2.a. As indicated above,

the inspector determined that the problem was identified by the licensee and reported to the NRC. Corrective actions were identified and completed as well. As a result, the licensee was informed that this non-willful, non-repetitive, licensee-identified and licensee-corrected violation would be treated as an NCV, consistent with Section 2.3.2.a of the NRC Enforcement Policy (NCV 05000186/2021203-04). This issue is considered closed.

c. Conclusion

The inspector reviewed an IFI and three Licensee Event Notifications/Reports. All issues were closed.

9. Exit Interview

The inspection scope and results were reviewed with the licensee on November 4, 2021. A second exit interview was held with the licensee on January 4, 2022. The inspector discussed the findings for each area reviewed. The licensee acknowledged the findings.

PARTIAL LIST OF PERSONS CONTACTED

Licensee Personnel

R. Astrino	Associate Reactor Manager
C. Braun	Interim Assistant Reactor Manager – Engineering
D. Doenges	Health Physics and Safety Manager
B. Fairchild	Assistant Health & Safety Manager – Training
L. Foyto	Associate Director, Reactor and Facilities Operations
R. Gibson	Interim Assistant Reactor Manager – Operations
R. Hudson	Interim Assistant Reactor Manager – Training
K. Kutikkad	Assistant Reactor Manager - Physics
J. Matyas	Access Control Manager
B. Meffert	Reactor Operations Manager
D. Rathke	Document Management Coordinator
D. Robertson	Reactor Facility Director

INSPECTION PROCEDURES USED

IP 69003	Class I Research and Test Reactor Operator Licenses, Requalification, and Medical Examinations
IP 69005	Class I Research and Test Reactor Experiments
IP 69006	Class I Research and Test Reactor Organization and Operations and Maintenance Activities
IP 69007	Class I Research and Test Reactor Review and Audit and Design Change Functions
IP 69008	Class I Research and Test Reactor Procedures
IP 69009	Class I Research and Test Reactor Fuel Movement
IP 69010	Class I Research and Test Reactor Surveillance
IP 69011	Class I Research and Test Reactor Emergency Preparedness
IP 97201	Follow-up

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000186/2021203-01	NCV	Failure to maintain the dose in any unrestricted area from external sources to less than 2 millirem in any one hour was a Severity Level IV violation of 10 CFR 20.1301(a)(2).
05000186/2021203-02	NCV	Failure to maintain the shim control blade B operable while the reactor was in operation.
05000186/2021203-03	IFI	Follow-up on the results of bench testing the component that caused the setpoint deviation in pressure transmitter 994B.
05000186/2021203-04	NCV	Failure of the reactor core outlet pressure channel associated with pressure transmitter 994B to provide a reactor scram at the TS low pressure setpoint.

Closed

05000186/2020202-02	IFI	Follow-up on the corrective actions identified following the new fuel damage event of August 23, 2020.
05000186/2021203-01	NCV	Failure to maintain the dose in any unrestricted area from external sources to less than 2 millirem in any one hour was a Severity Level IV violation of 10 CFR 20.1301(a)(2).
05000186/2021203-02	NCV	Failure to maintain the shim control blade B operable while the reactor was in operation.
05000186/2021203-04	NCV	Failure of the reactor core outlet pressure channel associated with pressure transmitter 994B to provide a reactor scram at the TS low pressure setpoint.

LIST OF ACRONYMS USED

10 CFR	Title 10 of the <i>Code of Federal Regulations</i>
AP	Administrative procedure
CAP	Corrective Action Program
CRDM	Control Rod Drive Mechanism
IFI	Inspector Follow-Up Item
IP	Inspection Procedure
LCO	Limiting Condition for Operations
MURR	University of Missouri Research Reactor
NRC	U.S. Nuclear Regulatory Commission
psia	Pounds per square inch absolute
RAC	Reactor Advisory Committee
Rev.	Revision
RO	Reactor Operator
SRO	Senior Reactor Operator
TSs	Technical Specifications