

January 4, 2013

Dr. Mohamad Al-Sheikhly, Director
Radiation Facilities and Nuclear Reactor
Department of Materials Science and Engineering
2309D Chemical and Nuclear Engineering Building
Building 090, Stadium Drive
The University of Maryland
College Park, MD 20742-2115

SUBJECT: UNIVERSITY OF MARYLAND - NRC ROUTINE INSPECTION REPORT
NO. 50-166/2012-202

Dear Dr. Al-Sheikhly:

From December 2 to 6, 2012, the U.S. Nuclear Regulatory Commission (NRC or the Commission) conducted an inspection at the Maryland University Training Reactor (Inspection Report No. 50-166/2012-202). The inspection included a review of activities authorized for your facility. The enclosed report documents the inspection results, which were discussed on December 6, 2012, with members of your staff.

This inspection was an examination of 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. 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 findings of significance were identified. No response to this letter is required.

In accordance with Title 10 of the *Code of Federal Regulations* Part 2.390, "Public inspections, exemptions, and 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 Document 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).

M. Al-Sheikhly

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Should you have any questions concerning this inspection, please contact Johnny Eads at (919) 219-9128 or by electronic mail at johnny.eads@nrc.gov.

Sincerely,

/RA/

Gregory T. Bowman, Chief
Research and Test Reactors Oversight Branch
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

Docket No. 50-166

License No. R-70

Enclosure: NRC Inspection Report No. 50-166/2012-202

cc: w/encl: See next page

University of Maryland

Docket No. 50-166

cc:

Director, Dept. of Natural Resources
Power Plant Siting Program
Energy & Coastal Zone Administration
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Mr. Roland Fletcher, Director
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Maryland Department of Environment
201 West Preston Street
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Mr. Vincent G. Adams
Facility Coordinator
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Test, Research, and Training
Reactor Newsletter
University of Florida
202 Nuclear Sciences Center
Gainesville, FL 32611

M. Al-Sheikhly

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

Docket No: 50-166

License No: R-70

Report No: 50-166/2012-202

Licensee: University of Maryland

Facility: Maryland University Training Reactor

Location: College Park, Maryland

Dates: December 2–6, 2012

Inspector: Johnny H. Eads, Jr.

Approved by: Gregory T. Bowman, Chief
Research and Test Reactors Oversight Branch
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

EXECUTIVE SUMMARY

University of Maryland
Maryland University Training Reactor Facility
NRC Inspection Report No. 50-166/2012-202

The primary focus of this routine, announced inspection was the onsite review of selected aspects of the University of Maryland (the licensee's) Class II research reactor facility safety programs including procedures, experiments, health physics, design changes, committees, audit and reviews, and transportation activities. The licensee's programs were acceptably directed toward the protection of public health and safety.

Organization and Staffing

- Reactor organization and staffing were in compliance with the requirements of the Technical Specifications (TS).

Operations Logs and Records

- Operational activities were found to be generally consistent with applicable TS and procedural requirements. However, one minor violation was identified related to timely submittal of annual reports.

Procedures

- Procedural control and implementation satisfied TS requirements.

Requalification Training

- Operator requalification was conducted as required by the requalification program.

Surveillance and Limiting Conditions for Operation

- The licensee's program for completing surveillance inspections and limiting condition for operation confirmations satisfied TS and licensee administrative controls.

Experiments

- Conduct and control of experiments met the requirements of regulations and the licensee's TS.

Design Changes

- Changes at the facility were acceptably reviewed in accordance with Title 10 of the *Code of Federal Regulations* Section 50.59 and applicable licensee administrative controls. However, one minor violation was identified related to written documentation of these reviews.

Committees and Audits and Reviews

- Review and oversight functions of the Reactor Safety Committee meet TS requirements.

REPORT DETAILS

Summary of Facility Status

The Maryland University Training Reactor (MUTR), licensed to operate at a maximum steady-state thermal power of 250 kilowatts, continues to be operated in support of academic classes, educational demonstrations, operator training, surveillance, and experiments. During the inspection, the reactor was maintained in a shutdown condition for maintenance and repair activities.

1. Organization and Staffing

a. Inspection Scope (Inspection Procedure (IP) 69001)

The inspector reviewed the following to verify compliance with the staffing requirements in Technical Specification (TS) 6.1, "Organization":

- MUTR organization diagram
- NRC-issued senior reactor operator (SRO) and reactor operator (RO) licenses
- Reactor Console Logbook, April 9, 2009, to December 15, 2012
- Reactor Console Logbook, December 16, 2010, to present

b. Observations and Findings

Through interviews with the University of Maryland's (licensee's) representatives, the inspector compared the management structure at the facility to requirements in the TS. The reactor staffing has significantly increased since the previous inspection with the addition of three student SROs. Currently, there are five SROs and two ROs licensed at the MUTR.

The MUTR staff's qualifications satisfied the training and experience requirements stipulated in the TS. The operations log confirmed that shift staffing met the minimum requirements for duty personnel.

The campus Radiation Safety Office staff, which provides oversight for multiple university licenses and activities conducted under the reactor license, occupies a building remote from the reactor building. However, the radiation protection staff is well integrated into the activities at the reactor and is providing significant value to ongoing reactor operations and maintenance activities.

c. Conclusion

The reactor organization and staffing were in compliance with the requirements of the TS.

2. Operation Logs and Records

a. Inspection Scope (IP 69001)

The inspector reviewed the following to ensure that selected records were maintained as required by TS 6.3, "Review and Audit;" TS 6.6, "Reports;" and TS 6.7, "Records":

- Annual Report for the MUTR for the period July 1, 2010, to June 30, 2011
- Daily startup checklists (from Operating Procedure (OP)-101) for the past year
- OP-101, "Reactor Startup Checkout," Rev. 13, dated November 1, 2011
- Reactor Console Logbook, April 30, 2009, to December 15, 2010
- Reactor Console Logbook, December 16, 2010, to present

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.

Through a review of the Annual Report for MUTR for the period July 1, 2010, to June 30, 2011, submitted December 19, 2011, the inspector identified that the report was not submitted to the NRC prior to September 30, as required by the TS.

The inspector informed the licensee that the failure to submit annual reports prior to the date specified in the TS constitutes a violation of minor significance that is not subject to enforcement action in accordance with Section 2.3.1 of the NRC Enforcement Policy.

c. Conclusion

Operational activities were found to be generally consistent with applicable TS and procedural requirements.

3. Procedures

a. Inspection Scope (IP 69001)

The inspector reviewed the following to ensure that the requirements of TS 6.3 were being met concerning written procedures:

- OP-101, "Reactor Startup Checkout," Rev. 13, dated November 1, 2011
- Surveillance Procedure (SP)-201, "Control Rod Poison Section Inspection," Rev. 13, October 27, 2011
- SP-202, "Reactor Power Calibrations," Rev. 13, October 31, 2011
- SP-203, "Control Rod Drop Time," Rev. 12, March 1, 2000

- SP-204, "Control Rod Calibration by the Positive Asymptotic Period Method," Rev. 13, June 14, 2012
- SP-212, "Control Rod Drive Mechanism Inspection," Rev. 13, November 1, 2011

b. Observations and Findings

The inspector reviewed a selection of written procedures and verified they addressed activities delineated in TS 6.3. The procedures were approved by the Radiation Safety Committee (RSC) and were of acceptable clarity and detail.

c. Conclusion

Procedural control and implementation satisfied TS requirements.

4. Requalification Training

a. Inspection Scope (IP 69001)

To verify that the licensee was complying with the requirements of the operator requalification program, the inspector reviewed selected aspects of:

- Requalification/training program for the MUTR and associated program checklists, dated March 21, 2000
- The effective dates of current operator licenses
- Operator medical examination records for the past year
- Current requalification cycle graded written examination
- Requalification training topic lesson plans
- Operator training records

b. Observations and Findings

There were five NRC-licensed SROs and two ROs on staff at the facility. 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. Attendance at required training sessions was well documented. Records documenting performance of required reactor manipulations were not being maintained separately, but rather were being tracked in the operations log book.

The inspector attended two sessions of operator requalification training. The sessions were well attended and there was active participation by the attendees.

c. Conclusion

Operator requalification was conducted as required by the requalification program.

5. Surveillance and Limiting Conditions for Operation

a. Inspection Scope (IP 69001)

The inspectors reviewed the following to verify compliance with TS Section 3.0, "Limiting Conditions for Operation," and to determine if the periodic surveillance tests on safety systems were performed as stipulated in TS Section 4.0, "Surveillance Requirements":

- "Control Rod Poison Section Inspection," dated October 1, 2012
- "Reactor Power Calibration," dated October 17, 2012
- "Control Rod Drop Time Data Sheet," dated October 1, 2012
- SP-201, "Control Rod Poison Section Inspection," Rev. 13, October 27, 2011
- SP-202, "Thermal Power Calibration Procedure," Rev. 13, October 31, 2011
- SP-203, "Control Rod Drop Time," March 1, 2000
- SP-204, "Control Rod Calibration by the Positive Asymptotic Period Method," Rev. 14, June 14, 2012
- File of daily startup checklists (from OP-101) for the past year

b. Observations and Findings

The inspector noted that daily, monthly, quarterly, and annual checks, tests, and/or calibrations for TS-required surveillance were completed as required. The limiting condition for operation verifications were completed on schedule and in accordance with licensee procedures. All of the recorded results were within the TS and procedurally prescribed parameters. The records and logs were noted to be complete and were being maintained as required. The procedures for each of the surveillances provided clear and concise direction and control of reactor operational tests and surveillances.

c. Conclusions

The licensee's program for completing surveillance inspections and limiting condition for operation confirmations satisfied TS and licensee administrative controls.

6. Experiments

a. Inspection Scope (IP 69001)

To verify compliance with licensee's procedures; TS 3.5, "Limitations on Experiments;" TS 6.4, "Experiment Review and Approval;" and Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.59, the inspector reviewed selected aspects of:

- Reactor Console Logbook, April 2009 to December 15, 2010

- Reactor Console Logbook, December 16, 2010, to present
- Annual Report, July 1, 2010, to June 30, 2011
- Reactor Safety Committee Minutes for Meeting of October 31, 2011
- Reactor Safety Committee Minutes for Meeting of June 14, 2012
- Proposal to determine the effect of irradiation and high temperature on the silicon carbide lattice structure and to determine the diffusion of cesium through silicon carbide, dated March 3, 2012

b. Observations and Findings

One new experiment had been initiated, reviewed, and approved since the previous inspection at the facility. The inspector conducted a walk-down of the installed experiment and verified that the experiment setup was as approved. The experiment was not operational at the time of the walk-down due to the reactor being shutdown for maintenance and repair. The inspector verified that the experiment review and approval was in accordance with TS limits and procedural requirements.

c. Conclusion

Conduct and control of experiments met the requirements of regulations and the licensee's TS.

7. Design Changes

a. Inspection Scope (IP 69001)

In order to verify that any modifications to the facility were consistent with 10 CFR 50.59, the inspector reviewed selected aspects of:

- Reactor Console Logbook, April 2009 to December 15, 2010
- Reactor Console Logbook December 16, 2010, to present
- Annual Report, July 1, 2010, to June 30, 2011
- Reactor Safety Committee Minutes for Meeting of October 31, 2011
- Reactor Safety Committee Minutes for Meeting of June 14, 2012
- Proposal to determine the effect of irradiation and high temperature on the silicon carbide lattice structure and to determine the diffusion of cesium through silicon carbide, dated March 3, 2012
- OP-101, "Reactor Startup Checkout," Rev. 13, dated November 1, 2011

b. Observations and Findings

Through review of applicable records and interviews with licensee personnel, the inspector determined that since the previous inspection there were no changes made which required prior NRC approval pursuant to 10 CFR 50.59. The inspector verified that administrative controls were in place that required the appropriate review and approval of facility changes prior to implementation.

Regulation 10 CFR 50.59(d)(1) states, "the licensee shall maintain records of changes in the facility, of changes in procedures, and of tests and experiments made pursuant to paragraph (c) of this section. These records must include a written evaluation which provides the bases for the determination that the change, test, or experiment does not require a license amendment pursuant to paragraph (c)(2) of this section." In addition, 10 CFR 50.59(d)(2) states, in part, that the licensee shall submit a report containing a brief description of any changes, tests, and experiments, including a summary of the evaluation of each.

The inspector reviewed one experiment and one procedure change for which 10 CFR 50.59 evaluations were required; however, no written evaluations were completed documenting the bases for the determination that the change did not require a license amendment. In addition, a report containing a brief description of the changes, including a summary of these evaluations, has not yet been submitted to the NRC as required.

The inspector informed the licensee that the failure to adequately document written evaluations performed in accordance with 10 CFR 50.59 constitutes a violation of minor significance that is not subject to enforcement action in accordance with Section 2.3.1 of the NRC Enforcement Policy. Inspector follow-up item 50-166/2012-202-01 has been identified to follow-up on ongoing corrective actions.

c. Conclusion

Changes at the facility were acceptably reviewed in accordance with 10 CFR 50.59 and applicable licensee administrative controls. However, one minor violation was identified related to documentation of these reviews.

8. Committees and Audits and Reviews

a. Inspection Scope (IP 69001)

The inspector reviewed the following to ensure that the audits and reviews stipulated in TS 6.2 were being completed by the RSC:

- Reactor Safety Committee Minutes for Meeting of October 31, 2011
- Reactor Safety Committee Minutes for Meeting of June 14, 2012
- Annual Report, July 1, 2010, to June 30, 2011
- Letter transmitting External Audit Results, dated January 26, 2012

b. Observations and Findings

The licensee's safety oversight was performed by its RSC. The RSC membership met the requirements of TS 6.2.2, "Reactor Safety Committee Charter and Rules." The inspector verified that the RSC composition, meeting quorums, and meeting frequency were all in accordance with TS 6.2.2.

The inspector also verified that the audit function required in TS 6.2.4, "Reactor Safety Committee Audit Function," was conducted and that the audit reports were reviewed by the RSC. The inspector reviewed the External Audit Results for an independent external audit conducted on January 23–24, 2012.

c. Conclusion

Review and oversight functions of the RSC appear to meet TS requirements.

9. Exit Interview

The inspection scope and results were summarized on December 6, 2012, with members of licensee management. The inspector described the areas inspected and discussed the inspection findings.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

V. Adams	Facility Coordinator and Senior Reactor Operator
M. Al-Sheikhly	Director, Radiation Facilities and Nuclear Reactor
M. Dorman	Assistant Director of Environmental Safety

INSPECTION PROCEDURES USED

IP 69001	Class II Non-Power Reactors
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ITEMS OPENED, CLOSED

OPENED:

IFI 50-166/2012-202-01	Follow-up on corrective actions related to written documentation of 10 CFR 50.59 safety evaluations
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CLOSED:

None

PARTIAL LIST OF ACRONYMS USED

10 CFR	Title 10 of the <i>Code of Federal Regulations</i>
ADAMS	Agencywide Document Access and Management System
IP	Inspection Procedure
MUTR	Maryland University Training Reactor
NRC	U.S. Nuclear Regulatory Commission
OP	Operating Procedure
RO	Reactor Operator
RSC	Reactor Safety Committee
SP	Surveillance Procedure
SRO	Senior Reactor Operator
TS	Technical Specifications