

April 4, 2006

Dr. Mohamad Al-Sheikhly, Director  
Radiation Facilities  
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: NRC ROUTINE, ANNOUNCED INSPECTION REPORT NO. 50-166/2006-201

Dear Dr. Al-Sheikhly:

This letter refers to the inspection conducted on February 21-24 and March 15, 2006 at the Maryland University Training Reactor. The inspection included a review of activities authorized for your facility. The enclosed report presents the results of that inspection.

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 noncompliance with NRC requirements were identified. No response to this letter is required.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>.

Should you have any questions concerning this inspection, please contact Mr. Kevin M. Witt at 301-415-4075.

Sincerely,

**/RA/**

Brian E. Thomas, Branch Chief  
Research and Test Reactors Branch  
Division of Policy and Rulemaking  
Office of Nuclear Reactor Regulation

Docket No. 50-166  
License No. R-70

Enclosure: NRC Inspection Report No. 50-166/2006-201  
cc w/enclosure: See next page

University of Maryland

Docket No. 50-166

cc:

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

Docket No: 50-166

License No: R-70

Report No: 50-166/2006-201

Licensee: University of Maryland

Facility: Maryland University Training Reactor

Location: College Park, Maryland

Dates: February 21-24 and March 15, 2006

Inspector: Kevin M. Witt

Approved by: Brian E. Thomas, Branch Chief  
Research and Test Reactors Branch  
Division of Policy and Rulemaking  
Office of Nuclear Reactor Regulation

## EXECUTIVE SUMMARY

### Maryland University Training Reactor NRC Inspection Report No.: 50-166/2006-201

The primary focus of this routine, announced inspection was the on-site review of selected aspects and activities since the last NRC inspection of the licensee's Class II non-power reactor safety programs including: organization and staffing, operations logs and records, procedures, operator requalification, surveillance and limiting conditions for operations, experiments, radiation protection program, design changes, committees, audits and reviews, emergency preparedness, maintenance logs and records, and fuel handling.

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 organization and staffing were consistent with Technical Specification requirements.

#### Operations Logs and Records

- Operational activities were consistent with applicable Technical Specification and procedural requirements.

#### Procedures

- Procedural control and implementation satisfied Technical Specification requirements.

#### Operator Requalification

- The licensee's requalification program was implemented satisfactorily, the program was up-to-date, and plan requirements were met.

#### Surveillance and Limiting Conditions for Operations

- The licensee's program for completing surveillance inspections and Limiting Conditions for Operation confirmations generally satisfied Technical Specification and licensee administrative controls.

#### Experiments

- The approval and control of experiments met Technical Specification and applicable regulatory requirements.

#### Radiation Protection Program

- Surveys were not completed and an Inspector Follow-up Item was issued to ensure the licensee conducts them on a routine basis.
- Postings met the regulatory requirements specified in 10 CFR Parts 19 and 20.

- Personnel dosimetry was being worn as required and doses were well within the licensee's procedural action levels and NRC's regulatory limits.
- Radiation monitoring equipment was being maintained and calibrated as required.
- The Radiation Protection Program being implemented by the licensee satisfied regulatory requirements.
- Effluent monitoring satisfied license and regulatory requirements and releases were within the specified regulatory and Technical Specification limits.

#### Design Changes

- Based on the records reviewed, the inspector determined that the licensee's design change program was being implemented as required.

#### Committees, Audits and Reviews

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

#### Emergency Preparedness

- The emergency preparedness program was conducted in accordance with the requirements stipulated in the Emergency Plan.

#### Maintenance Logs and Records

- Maintenance logs, records, and performance satisfied Technical Specification and procedure requirements.

#### Fuel Handling

- Fuel handling and control rod inspection activities were completed and documented as required by Technical Specification and facility procedures.

## REPORT DETAILS

### Summary of Plant Status

The licensee's research reactor, licensed to operate at a maximum steady-state thermal power of 250 Kilowatts (250 kW), continues to be operated in support of operator training, surveillance, and minor utilization. During the inspection, the reactor was not operated due to technical difficulties encountered during the startup checks. The licensee indicated that there has been no transportation of radioactive materials since the previous inspection.

### 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 Specifications (TS) Section 6.1 "Organization":

- organization and staffing
- qualifications
- management responsibilities
- administrative controls
- Annual Report for the MUTR for the dates July 1, 2003 to June 30, 2004
- Annual Report for the MUTR for the dates July 1, 2004 to June 30, 2005
- completed reactor startup checkout forms for 2004

#### b. Observations and Findings

The Maryland University Training Reactor (MUTR) organizational structure and the responsibilities of the reactor management and staff had not changed since the last inspection (see NRC Inspection Report No. 50-166/2004-201). Current licensed staff consisted of the facility coordinator (FC) and the facility director (FD). All of the staff members are qualified Senior Reactor Operators (SROs). The licensee is currently preparing for several staff members to become licensed operators and the inspector verified that the licensee is conducting the appropriate training for the operators in training.

The MUTR staff's qualifications satisfied the training and experience requirements stipulated in the TS. The operations log and associated records confirmed that shift staffing met the minimum requirements for duty personnel. Review of records verified that management responsibilities were administered as required by TS and applicable procedures.

Review of records verified that management responsibilities were administered as required by TS, applicable procedures, and that transitions in the staffs were properly managed. The 2004 annual report summarized the required information and was issued at the frequency specified in TS Section 6.6.1. No special reports were submitted pursuant to TS Sections 6.6.2 or 6.6.3.

c. Conclusion

The organization and staffing were consistent with TS requirements.

**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 Section 6.7:

- Procedure OP-101 "Reactor Startup Checkout" Revision 12, dated March 27, 2000
- Procedure OP-102 "Reactor Shutdown Checkout" Revision 12, dated March 27, 2000
- Procedure OP-103 "Reactor Startup" Revision 12, dated March 27, 2000
- Procedure OP-104 "Reactor Operations" Revision 12, dated March 27, 2000
- Annual Report for the MUTR for the dates July 1, 2003 to June 30, 2004
- Annual Report for the MUTR for the dates July 1, 2004 to June 30, 2005
- Operation Log Book for the period March 15, 2004 - present
- Completed Initial Reactor Startup Checklist forms, dated from January 30, 2004 to present
- Completed Reactor Shutdown Checklist forms, dated from January 30, 2004 to present

b. Observations and Findings

Reactor operations were carried out following written procedures and TS requirements. The inspector verified that reactor operating characteristics, and other TS and procedure required entries, were logged in the operating log and cross-referenced with other logs and checklists as required. A review of the logs and records indicated that TS operational limits had not been exceeded. Operations records confirmed that shift staffing met the minimum requirements for duty personnel. The inspector determined that reactor operations were carried out following written procedures.

Scrams that occurred during reactor operations were recorded in the operation log book in red pen. There were no scrams that had occurred during the inspection period. The previous scrams that were recorded in the logbook were the result of signal distortions at low power levels that has not been seen recently. If there were a scram to occur, the root cause analysis would be completed by the SRO on duty before the resumption of operations.

c. Conclusions

Operational activities were 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 Section 6.3 were being met concerning written procedures:

- administrative controls
- procedural implementation
- Procedure OP-100 "Control and Maintenance of Procedures" Revision 12, dated March 27, 2000

#### b. Observations and Findings

The inspector determined that written procedures were available for the activities delineated in TS Section 6.3 and were approved by the Reactor Safety Committee (RSC) before they were implemented. The clarity and detail in the procedures was acceptable. Temporary changes to the procedures that do not change their original intent can be authorized by the FD and must be subsequently reviewed by the RSC. MUTR staff members conducted TS activities in accordance with applicable procedures. No procedures have changed since the previous inspection. The licensee has created several new procedures, which have undergone the review process and are waiting for the renewal of the facility operating license before implementing the new procedures.

#### c. Conclusions

Procedural control and implementation satisfied TS requirements.

### 4. Operator Requalification

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

The inspector reviewed the following to verify compliance with the requirements in 10 CFR Part 55 and the Requalification Program for the MUTR:

- Reactor Operator Requalification Program for MUTR, dated November 8, 1993
- operator active license status
- operator physical examination records
- reactivity manipulation records
- MUTR Exam, undated
- MUTR Requalification/Training Program Attendance Records for the cycle December 1, 2005 - present
- Operation Log Book for the period March 15, 2004 to present
- MUTR Run Time Log, dated January 30, 2004 to present

b. Observations and Findings

The licensee's requalification program is described in the program submitted to the NRC. The inspector reviewed the requalification program records of the two SROs currently employed at the facility. The FC and FD are responsible for the implementation of the requalification program and administers all tests. The inspector verified that all of the operators' licenses were current. Records showed that operators were given written examinations biennially and annual operations tests as required. The inspector verified that physical examinations of the operators were conducted biennially as required. The inspector also verified that the operators were reviewing the contents of all abnormal and emergency procedures on an annual basis. The number of hours in the facility performing licensed duties were tallied in a run time log to ensure that all operators met the required minimum number of hours operating the reactor. The inspector confirmed that the requalification program was being administered in a manner that sufficiently maintains the effectiveness of all licensed operators.

The inspector reviewed the current list of operators and discovered that there are two individuals that have licenses at the facility and are no longer employed at the facility. The licensee has agreed to submit a letter to the NRC requesting that those licenses be terminated.

c. Conclusions

The licensee's requalification program was implemented satisfactorily, the program was up-to-date, and plan requirements were met.

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

a. Inspection Scope (IP 69001)

The inspector reviewed the following to ensure that the surveillance requirements and limiting conditions for operations (LCO) specified in TS Section 4.0 were met:

- Procedure SP-200 "Inspection, Calibration, and Maintenance Schedule" Revision 12, dated March 27, 2000
- Procedure SP-201 "Control Rod Poison Section Inspection" Revision 12, dated March 27, 2000
- Procedure SP-202 "Reactor Power Calibration" Revision 12, dated March 27, 2000
- Procedure SP-203 "Control Rod Drop Time" Revision 12, dated March 27, 2000
- Procedure SP-204 "Control Rod Calibration by the Positive Asymptotic Period Method" Revision 12, dated March 27, 2000
- Procedure SP-205 "Area Radiation Monitor Calibration" Revision 12, dated March 27, 2000
- Control Rod Calibration and Shutdown Margin Calculation, dated May 31, 2005

- Control Rod Drop Time Data Sheets, dated July 21, 2004 and July 17, 2005
- Control Rod Poison Section Inspection Sheets, dated May 21, 2002 and November 22, 2005
- Area Radiation Monitor Calibration Worksheets, dated February 16, 2004, February 14, 2005 and January 18, 2006
- Reactor Power Calibration Data Sheets, dated July 21, 2004 and July 14, 2005
- Reports on Reactor Air and Water Samples and Analysis, dated from January 2004 to present

b. Observations and Findings

The inspector noted that, in general, daily, monthly, quarterly, and annual checks, tests, and/or calibrations for TS-required surveillance were completed as required. The LCO 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. While reviewing the records of the control rod visual inspections, the inspector noted that the visual inspections were conducted on May 21, 2002 and November 22, 2005. This inspection period was approximately 42 months, which is greater than the 28 months specified by TS 4.2(5). The licensee was informed that failure to conduct a surveillance check required by the TSs was identified as an Unresolved Item<sup>1</sup> (URI) pending corrective actions and implementation of controls to prevent recurrence. This issue will be reviewed during a future inspection (URI 50-166/2006-201-01). The licensee has agreed to initiate a surveillance tracking program as part of their corrective actions. This surveillance tracking program includes placing a list of required surveillances in a conspicuous location, thus allowing all facility staff to ensure that the TS requirements are being followed.

The inspector observed the licensee completing part of the Reactor Startup Checklist for TS required items on February 23, 2006. A majority of the items on the checklist were carried out appropriately and the personnel conducting the tests did so in a safe and knowledgeable manner. During the startup checks, the operator in training discovered that the regulating rod would not withdraw upon command. The inspector verified that the operator in training immediately stopped the checks and consulted with the SRO on duty. The SRO on duty suspended reactor operations until the problem is diagnosed and resolved. The inspector verified that all of the checks conducted were in compliance with TS required values and parameters.

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<sup>1</sup>An Unresolved Item is a matter about which more information is required to determine whether the issue in question is an acceptable item, a deviation, a nonconformance, or a violation.

c. Conclusions

The licensee's program for completing surveillance inspections and LCO confirmations generally satisfied TS and licensee administrative controls.

**6. Experiments**

a. Inspection Scope (IP 69001)

The inspector reviewed selected aspects of the following to verify compliance with TS Section 2.3:

- experimental program requirements
- experimental administrative controls and precautions
- Procedure OP-105 "Installation of Experiments" Revision 12, dated March 27, 2000
- Completed Sample Irradiation forms, dated from June 21, 2004 to present
- Operation Log Book for the period March 15, 2004 to present

b. Observations and Findings

There has been one type of experiment conducted at the MUTR since the previous inspection, which is the routine irradiation of various materials. The most frequently used experimental facility is the pneumatic transfer system. Samples can be loaded and unloaded from the sample irradiation position while the reactor is at the desired power level. Samples that have been irradiated at the MUTR include aluminum foils, pennies, integrated circuits, and small amounts of boron. Either the SRO on duty or the FD approves all samples to be irradiated in accordance with the TS limitations. No new experiments had been initiated, reviewed, or approved since the previous inspection at the facility. If any new experiments were to be initiated, they would be reviewed and approved by the RSC. The inspector confirmed that all of the experiments conducted were in accordance with TS limits and procedural requirements.

c. Conclusions

The approval and control of experiments met TS and applicable regulatory requirements.

**7. Radiation Protection Program**

a. Inspection Scope (IP 69001)

The inspector reviewed the following to verify compliance with 10 CFR Part 19 and Part 20 and the applicable TS requirements:

- organization and staffing
- Radiation Safety Manual - University of Maryland (RSM), updated August 16, 2001

- Radiation Safety Basic Training, online version, undated
- Radiation Safety Officer (RSO) Departmental Procedure #001, "Instrument Calibration" dated October 2003
- RSO Departmental Procedure #002, "Water Sampling" dated November 3, 2003
- RSO Departmental Procedure #004, "Air Sampling" dated November 3, 2003
- Area Radiation Monitor Calibration Worksheets, dated February 16, 2004, February 14, 2005 and January 18, 2006
- Reports on Reactor Air and Water Samples and Analysis, dated from January 2004 to present
- radiological signs and posting
- bi-monthly dosimetry records for staff and students for 2004 and 2005
- bi-monthly dosimetry records for reactor room for 2004 and 2005
- quarterly dosimetry records for environmental monitoring for 2004 and 2005
- University of Maryland Radiation Facilities Visitor Log, dated from January 2004 to present
- maintenance and calibration of radiation monitoring equipment
- 2004 Audit of University of Maryland Radiation Protection Program (UM RPP), dated November 30, 2004
- 2005 Audit of UM RPP, dated December 14, 2005

b. Observations and Findings

The RSO applies the radiation protection program uniformly to the two licensed activities on campus (broad scope and the reactor). The licensee's program for radiological health and safety related to the reactor license was evaluated during this inspection.

(1) Surveys

No routine dose rate surveys were conducted in the reactor room. The licensee stated that continuous monitoring with fix mount dosimeters distributed in the reactor room demonstrated that worst case doses were below NRC limits. However, 10 CFR 20.1501 states that "each licensee shall make or cause to be made, surveys that are reasonable under the circumstances to evaluate: the magnitude and extent of radiation levels; concentrations or quantities of radioactive material; and the potential radiological hazards." The inspector determined that the licensee has not appropriately characterized the radiological conditions in the reactor bay. The licensee agreed to implement a change to the monthly procedures to have regular surveys conducted. This issue will be considered by the NRC as an Inspector Follow-up Item (IFI) and will be reviewed during the next inspection at the facility (IFI 50-166/2006-201-01).

(2) Postings and Notices

The inspector reviewed the postings required by 10 CFR Part 19 at the

entrances to various controlled areas including the reactor bay, and radioactive material storage areas. The postings were acceptable and indicated the radiation and contamination hazards present. The facility's radioactive material storage areas were noted to be properly posted. No unmarked radioactive material was found in the facility.

(3) Dosimetry

The licensee used a National Voluntary Laboratory Accreditation Program-accredited vendor, to process personnel dosimetry. Through direct observation, the inspector determined that dosimetry was used in an acceptable manner by facility personnel. For visitors to the facility, a portable ionization chamber dosimeter is generally issued to a group of individuals. Records indicate that no abnormal readings were obtained.

An examination of the records for the inspection period showed that all exposures were well within NRC limits and within licensee action levels. There are currently two permanent full time staff members at the MUTR that are being monitored by Thermal Luminescent Dosimeters (TLDs). All of the personnel associated with the facility received an annual deep dose exposure less than 66 millirem (mrem) for 2004 and 2005. The licensee investigates any dosimetry readings that indicate an exposure above 100 mrem for whole body and 300 mrem for extremities.

(4) Radiation Monitoring Equipment

The calibration of portable survey meters and friskers was typically completed by a company that specializes in calibrations while fixed radiation detectors were calibrated at the facility using a portable source. The calibration records of portable survey meters and fixed radiation detectors in use at the facility were reviewed. Calibration frequency met the requirements established in the applicable procedures while records were being maintained as required. The inspector observed that proper precautions are always used to maintain doses for calibrations as low as reasonably achievable (ALARA).

(5) Radiation Protection Program

The inspector verified that the radiation protection program was being reviewed annually as required. No issues related to the radiation protection program at the MUTR were identified in the review of the program.

The RSM requires that all personnel who work with radioactive materials receive training in radiation protection, policies, procedures, requirements, and the facilities prior to having unescorted access to the MUTR. The Radiation Safety Office is responsible for conducting the training and all of the training is typically conducted online along with a personalized question answer session with a health physicist. A test is

administered at the end of the training to verify that the individuals understood the material presented. The training covered the topics required to be taught in 10 CFR Part 19 and the review of training materials and tests indicated that the staff were instructed on the appropriate subjects.

(6) Facility Tours

The inspector toured the MUTR and the accompanying facilities. Control of radioactive material and control of access to radiation and high radiation areas were acceptable. The postings and signs for these areas were appropriate. The inspector also determined that there were no measurable releases of gaseous or liquid radioactive material from the research reactor facility.

(7) Environmental Monitoring

The licensee ensures compliance with NRC regulations for environmental monitoring by ensuring that all doses at the site boundary are less than the dose limits specified in 10 CFR 20.1301. Several TLDs are strategically placed in several locations around the perimeter of the MUTR. Records for 2004 indicate that doses were well below the applicable requirements and typically measure at background levels. Current exposure records for 2005 indicate no increased levels in exposures. There was no liquid effluent discharged from the facility.

Records show that projected gaseous emissions from the reactor are generally minimal. The licensee maintains an alarm at the exhaust point and the ventilation fans turn off automatically if the alarm set point is reached. The licensee calculates the maximum potential production of Ar-41 in the reactor and uses the value as input to the Environmental Protection Agency computational code "COMPLY," which shows that the licensee is in Level 2 compliance with 10 CFR 20.1301(a)(1).

c. Conclusions

The inspector determined that: (1) surveys were not completed and an IFI was issued to ensure the licensee conducts them on a routine basis, (2) postings met the regulatory requirements specified in 10 CFR Parts 19 and 20, (3) personnel dosimetry was being worn as required and doses were well within the licensee's procedural action levels and NRC's regulatory limits, (4) radiation monitoring equipment was being maintained and calibrated as required, (5) the RPP being implemented by the licensee satisfied regulatory requirements, and (6) effluent monitoring satisfied license and regulatory requirements and releases were within the specified regulatory and TS limits.

**8. 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:

- facility design changes and records for the past two years
- facility configuration and associated records
- Annual Report for the MUTR for the dates July 1, 2003 to June 30, 2004
- Annual Report for the MUTR for the dates July 1, 2004 to June 30, 2005
- Operation Log Book for the period March 15, 2004 to present

b. Observations and Findings

Through review of applicable records and interviews with licensee personnel, the inspector determined that no significant changes had been initiated and/or completed at the facility since the last inspection. The inspector verified that administrative controls were in place that required the appropriate review and approval of all changes prior to implementation. The inspector discussed a proposed maintenance activity that will require an evaluation to determine whether prior NRC approval is needed to conduct the activity. The activity planned is the removal of the thermal column plug. The licensee is planning on removing this plug to measure dose rates inside of the thermal column in preparation for a new experiment. The inspector communicated to the licensee the importance of conducting thorough evaluation of all potential complications that can occur since this project will be a high dose rate activity. The licensee indicated that close communications will be maintained with the NRC while this activity is being planned and implemented.

c. Conclusions

Based on the records reviewed, the inspector determined that the licensee's design change program was being implemented as required.

**9. Committees, Audits, and Reviews**

a. Inspection Scope (IP 69001)

The inspector reviewed the following to ensure that the audits and reviews stipulated in TS Section 6.2 and 10 CFR 50.59 were being completed by the RSC:

- Letters from Steven Petras, entitled, "Annual E-Drill/External Audit Results" dated August 18, 2004 and August 19, 2005
- RSC meeting minutes for meetings held July 15, and December 9, 2004

b. Observations and Findings

The RSC is defined in the TSs and the inspector verified that the committee is following all aspects of the requirements. The RSC had semiannual meetings

and a quorum was always present as required. Review of the minutes indicated the RSC discussed topics of concern to the use of the reactor, yet did not delve into a lot of the specifics that were discussed during the meetings. The licensee indicated that the RSC meetings are generally short and do not include much information since there have not been many activities of concern at the facility. The minutes for one of the meetings was lost while typing was being completed. The FD and FC could not recall any high priority items being discussed. Other licensees with similar oversight committees write their meeting minutes in more detail in order to show the focus and breadth of the items that the oversight committee discusses during the meeting.

Operations audits were performed and met the TS requirements. The audits appeared to be acceptable.

c. Conclusions

Review and oversight functions required by the TSs were acceptably completed by the RSC.

**10. Emergency Preparedness**

a. Scope (IP 69001)

The inspector reviewed selected aspects of:

- Emergency Preparedness Plan for the Maryland University Training Reactor (E-Plan), Revision 12, dated December 4, 1999
- Procedure EP-401 "Reactor Building Evacuation" Revision 12, dated March 27, 2000
- Procedure EP-402 "Primary Coolant System Leaks" Revision 12, dated March 27, 2000
- Procedure EP-403 "Response to Reportable Occurrences" Revision 12, dated March 27, 2000
- Procedure EP-404 "Release of Radioactivity" Revision 12, dated March 27, 2000
- Procedure EP-405 "Security" Revision 12, dated March 27, 2000
- Procedure EP-406 "Responsibilities of and Instruction to the MUTR Emergency Organization" Revision 10, dated June 10, 1993
- Procedure EP-407 "Nuclear Reactor Emergency Call List" Revision 12.4, dated August 16, 2001
- Emergency Supply Container Inventory for Room 1319, dated June 25, 2004 and June 17, 2005
- Emergency Supply Container Inventory for Room 2308, dated June 25, 2004 and June 17, 2005
- Memorandum of Understanding (MOU) with support agencies
- Letters from Steven Petras, entitled, "Annual E-Drill/External Audit Results" dated August 18, 2004 and August 19, 2005
- emergency response facilities, supplies, equipment and instrumentation
- emergency drills and exercises

- Operation Log Book for the period March 15, 2004 to present

b. Observations and Findings

The inspector reviewed the E-Plan in use at the MUTR and verified that the E-Plan was being properly implemented at the facility. The inspector reviewed the emergency facilities, instrumentation, and equipment and verified that the off-site emergency response equipment was as described in the E-Plan. The inspector verified that an MOU had been established with the Prince Georges Fire Department. As part of the MOU with the fire department, the licensee agreed to review the MOU on a biennial basis and the licensee stated that this has not been conducted in the recent past. The purpose of the MOU is to ensure the fire department is fully aware of what their responsibilities are during an emergency at the facility. With the high turnover rate at the College Park Fire Station, this coordination would provide added assurance that the people in charge are informed about what they have to do during an emergency. This issue will be considered by the NRC as an IFI and will be reviewed during the next inspection at the facility (IFI 50-166/2006-201-02).

Through direct observation, records review, and interviews with emergency organization personnel, the inspector determined that they were capable to respond, and knowledgeable of the proper actions to take in case of an emergency. The MUTR staff is responsible for responding to an emergency during all hours and making initial assessment and corrective and protective actions. The responsibility and authority for directing and coordinating emergency response activities are assigned to the FD, acting as the emergency director. All MUTR staff receive annual emergency response training. The inspector verified that the licensee has continually reviewed the E-Plan, conducted an inventory of the first aid kit annually, and checked the emergency siren monthly.

Emergency drills had been conducted annually as required by the E-Plan. The drill for 2004 and 2005 were both table top exercises and basically tested the notification of emergency personnel. Critiques were written and discussed following the drills to document any problems identified during the exercises. The licensee has conducted orientation tours for the UM police department and the fire department. The inspector has observed the benefits of conducting practical emergency drills and provided this information to the licensee. The licensee stated that they are planning an emergency drill in the summer of 2006 that will involve numerous emergency support organizations.

The inspector visited the Prince Georges County Fire Department in College Park, MD on February 24, 2006, and talked about the supplies and equipment at this support site that would be available in case of an emergency. There appeared to be a good working relationship between the licensee and this support organization. The inspector confirmed that the fire department was well prepared to handle a variety of injuries that could happen at the MUTR.

c. Conclusions

The emergency preparedness program was conducted in accordance with the requirements stipulated in the E-Plan.

**11. Maintenance Logs and Records**

a. Inspection Scope (IP 69001)

To verify that the licensee was complying with the applicable regulations, the inspector reviewed selected aspects of:

- Annual Report for the MUTR for the dates July 1, 2003 to June 30, 2004
- Annual Report for the MUTR for the dates July 1, 2004 to June 30, 2005
- Operation Log Book for the period March 15, 2004 to present

b. Observations and Findings

The inspector reviewed the maintenance records related to 2004 and 2005 scheduled and unscheduled preventive and corrective maintenance activities. Routine/preventive maintenance was controlled and documented in the Log Book. This review indicated that all maintenance activities were controlled and documented in the maintenance and/or operations log consistent with the requirements in 10 CFR 50.59.

All maintenance of reactor systems were reviewed by the FC. Implementation of changes to equipment, systems, tests or experiments are generally done by any of the staff at the facility. After all maintenance items are completed, system operational checks are performed to ensure the affected systems function before returning them to service. During a facility tour, the inspector noted that in general, Control Room and Reactor Room equipment was operational. As noted previously, the inspector observed the licensee conduct a startup check. During the startup checks, the operator in training discovered that the regulating rod would not withdraw upon command. The licensee was properly diagnosing the problem at the end of the inspection and later determined that the magnet in the control rod drive was rubbing against the drive tube causing the control rod to stick at certain points. The licensee disassembled the system and cleaned all the parts thoroughly before reassembling it. The licensee conducted extensive checks on the control rod drive after cleaning it and was not able to reproduce the initial problem. The inspector determined that the licensee followed all applicable procedures and regulations in fixing the problem with the control rod drive.

c. Conclusions

Maintenance logs, records, and performance satisfied TS and procedure requirements.

## 12. Fuel Handling

### a. Inspection Scope (IP 69001)

To verify that TS and procedural requirements were being met, the inspector reviewed selected aspects of:

- Procedure MP-303 "Fuel Movement" Revision 12, dated March 27, 2000
- fuel handling equipment and instrumentation
- fuel movement and inspection records
- Operation Log Book for the period March 15, 2004 to present

### b. Observations and Findings

The inspector determined that the licensee was maintaining the records of the various fuel movements that had been completed and verified that the movements were conducted and recorded in compliance with procedure. Log entries in the log book clearly identified, as required by procedure, that a minimum of two persons were present when fuel was being moved. The inspector determined that the procedures and the controls specified for these operations were acceptable.

### c. Conclusions

Fuel handling and control rod inspection activities were completed and documented as required by TS and facility procedures.

## 13. Exit Meeting

The inspector presented the inspection results to licensee management at the conclusion of the inspection on February 23, 2006 and supplemented the information during a teleconference on March 15, 2006. The licensee acknowledged the findings presented.

## PARTIAL LIST OF PERSONS CONTACTED

### Licensee

V. Adams, Facility Coordinator and Senior Reactor Operator  
M. Al-Sheikhly, Director, Radiation Facilities  
J. Gruber, Major, University of Maryland Police Department  
S. Hand, Radiation Safety Officer  
M. Kotlas, Director, Department of Environmental Safety  
G. Tucker, Captain, College Park Volunteer Fire Department  
B. Zidek, Health Physicist

## INSPECTION PROCEDURES USED

IP 69001 CLASS II NON-POWER REACTORS

## ITEMS OPENED, CLOSED, AND DISCUSSED

### OPENED:

50-166/2006-201-01 URI	Failure to conduct visual inspections of the control rods in accordance with TS requirements.
50-166/2006-201-01 IFI	Follow-up to verify that the licensee conducts intermittent surveys in the reactor bay.
50-166/2006-201-02 IFI	Follow-up to verify that the licensee reviews the Memorandum of Understanding with the Prince Georges County Fire Department.

### CLOSED:

None

## LIST OF ACRONYMS USED

ADAMS	Agencywide Document Access and Management System
ALARA	As Low As Reasonably Achievable
CFR	Code of Federal Regulations
FC	Facility Coordinator
FD	Facility Director
IFI	Inspector Follow-up Item
IP	Inspection Procedure
KW	Kilowatts
LCO	Limiting Condition for Operation
MREM	Millirem
MUTR	Maryland University Training Reactor
NRC	Nuclear Regulatory Commission
RPP	Radiation Protection Program
RSC	Reactor Safety Committee
RSM	Radiation Safety Manual

RSO	Radiation Safety Officer
SRO	Senior Reactor Operator
TLD	Thermal Luminescent Dosimeter
TS	Technical Specifications
UM	University of Maryland
URI	Unresolved Item