

October 2, 2015

Dr. Steven Biegalski
Director, Nuclear Engineering
Teaching Laboratory
University of Texas at Austin
Pickle Research Campus, Building 159
Mail Code R9000
Austin, TX 78712-1024

SUBJECT: UNIVERSITY OF TEXAS AT AUSTIN – NRC ROUTINE INSPECTION REPORT
NO. 50-602/2015-201

Dear Dr. Biegalski:

From August 31-September 3, 2015, the U.S. Nuclear Regulatory Commission (NRC or the Commission) completed an inspection at your University of Texas at Austin Nuclear Engineering Teaching Laboratory facility (Inspection Report No. 50-602/2015-201). The enclosed report documents the inspection results, which were discussed on September 3, 2015, with you and Dr. P. Michael Whaley, Associate Director, University of Texas Nuclear Engineering Teaching Laboratory; Mr. Michael Krause, Reactor Supervisor; and other members of your staff.

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

In accordance with Title 10 of the *Code of Federal Regulations* Section 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 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). Should you have any questions concerning this inspection, please contact Mr. Gary Morlang at (301) 415-4092 or by electronic mail at Gary.Morlang@nrc.gov.

Sincerely,

/RA/

Kevin Hsueh, Chief
Research and Test Reactors Oversight Branch
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

Docket No. 50-602
License No. R-129

Enclosure:
NRC Inspection Report No. 50-602/2015-201

cc: See next page

University of Texas at Austin

Docket No. 50-602

cc:

Budget, Planning, and Policy Division
Office of the Governor
P.O. Box 12428
Austin, TX 78711

Radiation Control Program, MC 2835
Texas Department of State Health Services
P.O. Box 149347
Austin, TX 78714-9347

Dr. Gregory Feues, President
The University of Texas at Austin
Office of the President
P.O. Box T
Austin, TX 78713-8920

Mr. Roger Mulder
NRC State Liaison Officer
Texas State Energy Conservation Office
LBJ State Office Building
111 East 17th Street
Austin, TX 78774

Dr. P. Michael Whaley, Associate Director
Nuclear Engineering Teaching Laboratory
The University of Texas at Austin
10100 Burnet Road, R9000
Austin, TX 78758

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

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Director, Nuclear Engineering
Teaching Laboratory
University of Texas at Austin
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U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION

Docket No: 50-602

License No: R-129

Report No: 50-602/2015-201

Licensee: The University of Texas at Austin

Facility: Nuclear Engineering Teaching Laboratory

Location: Austin, TX 78758

Dates: August 31–September 3, 2015

Inspector: Gary Morlang

Approved by: Kevin Hsueh, Chief
Research and Test Reactors Oversight Branch
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

Enclosure

EXECUTIVE SUMMARY

The University of Texas at Austin
Nuclear Engineering Teaching Laboratory
Report No.: 50-602/2015-201

The primary focus of this routine, announced inspection included onsite review of selected aspects of the University of Texas at Austin (the licensee's) Nuclear Engineering Teaching Laboratory TRIGA Mark II research reactor safety program including: (1) organizational structure and staffing, (2) operations logs and records, (3) procedures, (4) operator requalification, (5) surveillance testing and limiting conditions for operation, (6) experiments, (7) health physics, (8) effluents and environmental monitoring, (9) design changes, (10) committees, audits, and review, (11) emergency preparedness, (12) maintenance, (13) fuel handling, and (14) transportation of radioactive material since the last NRC inspection in these areas. The licensee's program was acceptably directed toward the protection of public health and safety and was in compliance with U.S. Nuclear Regulatory Commission (NRC) requirements.

Organizational Structure and Staffing

- The organizational structure, functions, and staffing were consistent with Technical Specifications requirements. Staff qualifications satisfied Technical Specifications requirements.

Operations Logs and Records

- Reactor operations and logs were being maintained acceptably and operations were carried out in accordance with procedural and Technical Specifications requirements.

Procedures

- The procedural control and implementation program satisfied Technical Specifications requirements. Procedural compliance was acceptable.

Operator Requalification

- The operator requalification program was up-to-date and being acceptably maintained.
- Medical examinations were being completed biennially as required.

Surveillance Testing and Limiting Conditions for Operation

- The program for surveillance testing, including checks, tests, and calibration of equipment, was being implemented in accordance with requirements specified in Sections 3 and 4 of the Technical Specifications.

Experiments

- The program for the review, approval, and control of experiments satisfied Technical Specifications and regulatory requirements.

Health Physics

- Radiation protection and the associated training programs were being implemented as required.

Effluents and Environmental Monitoring

- Based on the records reviewed, the effluent monitoring and release program satisfied NRC requirements.

Design Changes

- The review and audit program satisfied Technical Specifications requirements.
- The changes made at the facility since the last NRC inspection had been reviewed using the criteria in Title 10 of the *Code of Federal Regulations* Section 50.59 and had been reviewed and approved by the licensee's oversight committee, as required.

Committees, Audits, and Review

- The review and audit program satisfied Technical Specifications requirements

Emergency Preparedness

- The emergency plan and implementing procedures were being audited and reviewed biennially as required.
- Letters of agreements documenting emergency support to be provided by offsite agencies were being maintained and updated as required.
- Annual drills were being held and documentation was maintained concerning the follow-up critiques and subsequent corrective actions taken as needed.
- Emergency preparedness training for staff personnel was being conducted as stipulated in the emergency plan.

Maintenance

- The facility maintenance program was being implemented as required by facility procedures.

Fuel Handling

- Reactor fuel movements and inspections were made and documented in accordance with procedure.
- Fuel elements were being inspected on a biennial basis as required by the Technical Specifications.

Transportation of Radioactive Material

- Radioactive material was shipped in accordance with licensee procedures and the applicable regulations. Staff personnel assigned to ship radioactive material had received the proper training as required.

REPORT DETAILS

Summary of Facility Status

The University of Texas at Austin's (UT's or the licensee's) 1.1 megawatt TRIGA Mark II research reactor continued routine operations. The reactor was operated in support of laboratory experiments, maintenance and surveillance testing, and operator training. During the inspection, the reactor was not operated as maintenance to repair a leaking beam port bellows was in progress.

1. Organizational Structure and Staffing

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

The inspector reviewed the following regarding the licensee's organizational structure and staffing to ensure that the requirements of Sections 6.1 and 6.6.1 of licensee's Technical Specifications were being met:

- Qualifications of health physics personnel
- Management responsibilities and administrative controls
- The UT Nuclear Engineering Teaching Laboratory (NETL) organizational structure and staffing
- Administrative controls outlined in NETL Procedure No. ADMN-3, "Personnel and Operator Qualifications," Rev. 0, approval dated January 31, 1992
- The University of Texas at Austin, Nuclear Engineering Teaching Laboratory, 2013 Annual Report, submitted March 31, 2014
- The University of Texas at Austin, Nuclear Engineering Teaching Laboratory, 2014 Annual Report, submitted March 31, 2015
- American National Standards Institute/American Nuclear Society (ANSI/ANS) Standard 15.4-1988, "Selection and Training of Personnel for Research Reactors," dated June 9, 1988, and reaffirmed July 12, 1999

b. Observations and Findings

Through records review and interviews with licensee personnel, the inspector noted that the health physics organizational structure had not changed since the last U.S. Nuclear Regulatory Commission (NRC) inspection in this area. The reactor NETL health physics staff was comprised of the Reactor Health Physicist and several part-time Health Physics technicians. Organization, structure, responsibilities, and staffing were as required by Technical Specifications Section 6.1. Through review of various records and discussions with personnel, the inspector determined that the NETL staff satisfied the Technical Specifications requirements and conformed to those outlined in ANSI/ANS-15.4, "Selection and Training of Personnel for Research Reactors."

Operations staff members performed some of the health physics functions at the reactor. Coordination of health physics activities between the two groups was acceptable. It was also noted that UT campus radiation protection technical staff personnel provided additional support to the reactor as needed. The campus

Radiation Safety Officer was a member of the UT Reactor Oversight Committee (UT-ROC).

c. Conclusion

The organizational structure, functions, and staffing were consistent with Technical Specifications requirements. Staff qualifications satisfied Technical Specifications requirements.

2. Operations Logs and Records

a. Inspection Scope (IP 69001)

The inspector reviewed selected aspects of the following to verify operation of the reactor in accordance with Technical Specifications Sections 3 through 5 and Technical Specifications Section 6.1.3:

- Technical Specifications through Amendment 4, dated May 10, 2001
- Maintenance log for 2013 through the present
- Selected monthly checklists for 2014 through the present
- Selected prestart check sheets for 2011 through the present
- Selected UT-TRIGA instrumentation and control system (ICS) console operation log sheets for 2014 and 2015
- Selected startup-shutdown check sheets and the associated experiment startup-shutdown check sheets and heat exchanger startup-shutdown check sheets for 2014 through the present
- Scram log sheets and startup reactivity calculation records from January 2014 to the present
- Nuclear Engineering Teaching Laboratory (NETL) Operation Procedure, OPER-1, "Startup - Shutdown Checks," Version (Ver.) 1.00, approved April 3, 2002
- NETL Operation Procedure, OPER-2, "Reactor Startup and Shutdown," Ver. 1.00, approved April 3, 2002
- NETL Operation Procedure, OPER-3, "Reactor Operation Modes," Ver. 1.00, approved April 12, 2002
- NETL Operation Procedure, OPER-4, "Operation of Reactor Water Systems," Ver. 1.00, approved April 3, 2002
- NETL Operation Procedure, OPER-5, "Operation of Air Confinement System," Ver. 1.00, approved April 3, 2002
- NETL Operation Procedure, OPER-6, "Reactor Bay Systems," Ver. 1.00, approved April 3, 2002
- The University of Texas at Austin, Nuclear Engineering Teaching Laboratory, 2013 Annual Report, submitted March 31, 2014
- The University of Texas at Austin, Nuclear Engineering Teaching Laboratory, 2014 Annual Report, submitted March 31, 2015

b. Observations and Findings

The inspector reviewed selected operations records from January 2014 through the present. These records included daily startup-shutdown checklists, log sheets, experiment startup and shutdown checklists, weekly checklists, monthly checklists, and other associated forms. Information on the operational status of the facility was recorded accurately on the log sheets and/or the checklists as required by procedure.

The inspector observed the performance of maintenance to repair a leaking beam port bellows. The entire core had been removed from the tank including fuel elements and control rods.

Through interviews with operators and review of logs and records, the inspector confirmed that shift staffing met the minimum requirements for duty and on-call personnel as required by Technical Specifications Section 6.1.3. This was noted on the log sheets by listing the names of the individuals designated as the reactor operator and the senior reactor operator.

c. Conclusion

Reactor operations and logs were being maintained acceptably and operations were conducted in accordance with procedural and Technical Specifications requirements.

3. Procedures

a. Inspection Scope (IP 69001)

The inspector reviewed selected aspects of the following to verify compliance with Technical Specifications Section 6.3 and 6.4 requirements:

- Procedural implementation
- Records of changes to NETL procedures
- Records of UT-Reactor Oversight Committee review and approval
- Administrative controls documented in NETL Procedure No. ADMN-1, "NETL Procedure Control," Version 3.00, approval dated April 14, 2010
- Selected NETL Procedures dealing with operations, maintenance, surveillance, administrative controls, fuel movement, and radiation protection

b. Observations and Findings

Procedures were available for those tasks and items required by Technical Specifications Sections 6.3 and 6.4. The licensee controlled minor and significant changes to procedures, and the associated review and approval processes, by use of administrative procedures. It was noted that the health physics procedures had all been revised and reformatted in 2013. The

procedures reviewed by the inspector had been reviewed and approved by the NETL Facility Director and the Reactor Oversight Committee as required.

Training of personnel on procedures and any changes to procedures was acceptable. Through observation of various activities during the week, the inspector determined that licensee personnel used and followed facility procedures as required. Procedural compliance was acceptable.

c. Conclusion

The procedural control and implementation program satisfied Technical Specifications requirements. Procedural compliance was acceptable.

4. Operator Requalification

a. Inspection Scope (IP 69001)

To determine that operator requalification activities and training were conducted as required by the UT-TRIGA requalification plan and that medical requirements were met, the inspector reviewed:

- Active license status of all current reactor operators and senior reactor operators
- Medical examination records for selected operators
- Training lectures and records for the training cycle (2014–2015)
- UT-TRIGA Requalification Plan, Revision (Rev.) 1, dated November 1990
- Written examinations given during 2014
- Logs and records of reactivity manipulations for the requalification cycle (2014–2015)
- NETL Administrative Procedure, ADMN-3, "Procedures for Personnel and Operator Qualifications," Rev. 0, approved January 31, 1992

b. Observations and Findings

There were five licensed senior reactor operators and three licensed reactor operators at the facility. A review of all of the operators' licenses showed that they were current. The inspector also noted that there were two students who were in training.

A review of the logs and records showed that training was being conducted in accordance with the licensee's requalification and training program. Records of quarterly reactor operations, reactivity manipulations, and operator activities indicating operator proficiency were being maintained. Documentation indicating the completion of semiannual change and procedure reviews by the operators and annual supervisory evaluations of the operators were also maintained. Annual written examinations were being completed as required or credit was taken by the licensee for the licensed operator exams administered by the NRC to satisfy the requalification cycle exam requirements when applicable.

The inspector verified that operators were receiving the required biennial medical examinations as well. As of the date of the inspection, one operator was due for a physical exam. The licensee indicated that the physical examination would be scheduled upon the return of the student from a summer internship.

c. Conclusion

The requalification program was up-to-date and being acceptably maintained. Medical examinations were being completed biennially as required.

5. Surveillance Testing and Limiting Conditions for Operation

a. Inspection Scope (IP 69001)

To determine that maintenance and surveillance activities and calibrations were being completed as required by Technical Specifications Sections 3 and 4, the inspector reviewed:

- Technical Specifications through Amendment 4, dated May 10, 2001
- System maintenance log for 2013 through the present
- Weekly-monthly surveillance log for 2014 through the present
- Selected UT-TRIGA ICS console operation log sheets from January 2014 through the present
- NETL Maintenance Procedure, MAIN-1, "Interlock and SCRAM Features," Ver. 3.00, approved July 26, 2000
- NETL Maintenance Procedure, MAIN-2, "Instrument System Features," Ver. 3.00, approved July 26, 2000
- NETL Maintenance Procedure, MAIN-3, "Support System Features," Ver. 3.00, approved July 26, 2000
- NETL Maintenance Procedure, MAIN-6, "Rod and Drive Maintenance, Inspection," Ver. 3.00, approved July 26, 2000
- NETL Operation Procedure, OPER-6, "Reactor Bay Systems," Ver. 1.00, approved April 4, 2002
- NETL Surveillance Procedure, SURV-1, "Fuel Temperature Calibration," Rev. 0, approved January 24, 1992
- NETL Surveillance Procedure, SURV-2, "Reactor Pool Power Calibration," Rev. 1, approved March 2, 2009
- NETL Surveillance Procedure, SURV-3, "Excess Reactivity and Shutdown Margin," Ver. 2.00, approved April 4, 2002
- NETL Surveillance Procedure, SURV-4, "Reactor Water Systems Surveillance," Rev. 1, approved January 22, 1991
- NETL Surveillance Procedure, SURV-5, "Air Confinement System Surveillance," Rev. 2, approved April 4, 2002
- NETL Surveillance Procedure, SURV-6, "Control Rod Calibration," Rev. 1, approved March 2, 2009
- NETL Surveillance Procedure, SURV-7 "Pulse Characteristic Comparison," Rev. 0, approved January 24, 1992

- The University of Texas at Austin, Nuclear Engineering Teaching Laboratory, 2013 Annual Report, submitted March 31, 2014
- The University of Texas at Austin, Nuclear Engineering Teaching Laboratory, 2014 Annual Report, submitted March 31, 2015

b. Observations and Findings

The inspector reviewed selected surveillance procedures and records including the weekly-monthly surveillance log. The inspector determined that selected weekly, monthly, semiannual, and annual checks, tests, and/or calibrations for technical specifications required surveillances were completed as stipulated. The tests and calibrations reviewed were completed on schedule and in accordance with licensee procedures. The appropriate records and logs reviewed were being maintained as required.

c. Conclusion

The program for surveillance testing, including checks, tests, and calibration of equipment was being carried out in accordance with Technical Specifications Section 3 and 4 requirements.

6. Experiments

a. Inspection Scope (IP 69001)

In order to verify that experiments were being reviewed, approved, and conducted within the guidelines specified in Technical Specifications Sections 3.4, 4.4, and 6.4, the inspector reviewed:

- UT-TRIGA ICS console operation log sheets from 2014 through the present
- Selected experiment authorization forms documenting the experiments as routine or special experiments and as Class A or B
- Selected operation request forms for 2014 through the present
- NETL Administrative Procedure, ADMN-6, "Authorization of Experiments," Rev. 1, approved January 15, 1993
- NETL Fuel Procedure, FUEL-2, "Movement of Experiments," Rev. 0, approved July 30, 1991
- NETL Experiment Procedure, EXP-PTS, "Pneumatic Transfer System," Ver. 2.00, approved August 20, 1998
- NETL Experiment Procedure, EXP-B3.1, "Neutron Activation Analysis," Rev. 0, approved January 15, 1993
- NETL Operation Procedure, OPER-1, "Startup - Shutdown Checks," Ver. 1.00, approved April 4, 2002
- NETL Operation Procedure, OPER-2, "Reactor Startup and Shutdown," Ver. 1.00, approved April 4, 2002

- The University of Texas at Austin, Nuclear Engineering Teaching Laboratory, 2013 Annual Report, submitted March 31, 2014
- The University of Texas at Austin, Nuclear Engineering Teaching Laboratory, 2014 Annual Report, submitted March 31, 2015

b. Observations and Findings

Through discussions with licensee personnel and records review, the inspector determined that there had been no new experiments proposed since the last inspection. The inspector noted that the majority of the experiments conducted at the facility were well-established procedures that had been in place for several years. These were generally the type of experiments known as routine experiments and were authorized for repeat applications. A few experiments were specified as special experiments and were those that were typically authorized for one particular application. The current experiments were also classified as either Class A or Class B experiments. Class A experiments were those that were required to be conducted or supervised by a Senior Reactor Operator. Class B experiments were those of less significance or hazard and required the presence of a reactor operator with a senior reactor operator available as needed.

The inspector verified that the experiments in use at the facility had been reviewed and approved by the facility's Reactor Oversight Committee. It was also noted that all the experiments had been analyzed to provide such information as physical effects, including reactivity, thermal hydraulic potential, and mechanical stress, as well as a material evaluation, including radioactivity and material hazards.

The inspector noted that experiments and typical sample loading data were documented on operation request and material evaluation forms, experiment startup/shutdown check forms, UT-TRIGA ICS console operation log forms, and 3-L irradiation facility forms. The sample unloading and radiological results were typically documented on central thimble facility forms, rotating sample rack loading forms, 3-L irradiation facility forms, and sample (in-core) forms as required. The records and forms were subsequently forwarded to the facility administrative assistant for billing purposes and then filed as required by procedure.

c. Conclusion

The license's program for reviewing, approving, and conducting experiments satisfied Technical Specifications and regulatory requirements.

7. Health Physics

a. Inspection Scope (IP 69001)

The inspector reviewed selected aspects of the following to verify compliance with 10 CFR Parts 19 and 20 and Technical Specifications Sections 3.3.3, 4.3.3, and 6.6.1:

- Dosimetry/exposure records for 2014 through the present
- As Low As Reasonably Achievable (ALARA) reviews to date
- Radiological barriers, signs, and posting in various areas of the facility
- NETL Procedure No. ADMN-4, "Radiation Protection Program," Rev. v.2.0, approval dated January 23, 2013
- NETL Procedure No. HP-001 to HP-007 and associated forms; v.3, approval dated January 23, 2013
- The University of Texas at Austin, Nuclear Engineering Teaching Laboratory, 2013 Annual Report, submitted March 31, 2014
- The University of Texas at Austin, Nuclear Engineering Teaching Laboratory, 2014 Annual Report, submitted March 31, 2015

b. Observations and Findings

(1) Postings and Notices

Copies of current notices to workers were posted in appropriate areas in the facility. Radiological signs and survey maps were typically posted at the entrances to controlled areas. Caution signs, postings, and controls for radiation areas were as required in 10 CFR Part 20. Licensee personnel observed the precautions for access to radiation and other controlled areas.

(2) Dosimetry

The licensee used optically-stimulated luminescent dosimeters for whole body monitoring with a component to measure neutron radiation, and thermoluminescent finger ring dosimetry for extremity monitoring. Dosimetry was issued to staff and visitors as outlined in licensee procedures and the requirements of 10 CFR 20.1502 for individual monitoring. The dosimetry was supplied and processed by a National Voluntary Laboratory Accreditation Program accredited vendor. Through direct observation, the inspector determined that dosimetry was acceptably used by facility personnel and exit frisking practices were in accordance with radiation protection requirements.

An examination of dosimetry results indicating radiological exposures at the facility for the past 2 years showed that the highest occupational doses, as well as doses to the public, were within 10 CFR Part 20 limitations.

(3) Radiation Protection Program

The licensee's Radiation Protection and ALARA programs were established and described in two NETL procedures, Procedure Nos. ADMN-4 and HP00-3. These procedures contain instructions concerning organization, training, monitoring, personnel responsibilities, audits, record keeping, and reports. The programs, as established, appeared to be acceptable.

The inspector determined that the licensee reviewed the radiation protection program in 2013. Revisions were made, the Reactor Oversight Committee approved the final version, and the new procedures became effective in January 2013. This update was accomplished through the annual ALARA Committee meetings and/or the Reactor Oversight Committee meetings.

(4) Radiation Protection Training

The inspector reviewed the radiation worker training given to NETL facility faculty and staff members and to students and student assistants. The licensee indicated that initial training was given when an individual first arrived at the facility and refresher training was given every 2 years thereafter. Training records showed that personnel were acceptably trained in radiation protection practices. The inspector verified that the training received was in compliance with 10 CFR Part 19 and that the training program was acceptable.

(5) Surveys

The inspector reviewed selected weekly, monthly, quarterly, and other periodic radiation and/or contamination survey records for 2013 and 2014 and verified that Health Physics staff completed the surveys for this time period.

(6) Radiation Monitoring Equipment

The inspector reviewed instrumentation calibration records, which indicated that licensee staff typically completed the calibration of portable survey meters, although some instruments were shipped to vendors for calibration. During the inspection the inspector observed the new calibration equipment used for calibrating portable survey meters at the NETL. The new equipment reduces staff exposure during calibration.

c. Conclusion

Radiation protection and the associated training programs were being implemented as required.

8. Effluents and Environmental Monitoring

a. Inspection Scope (IP 69001)

To determine that the licensee was complying with the regulations in 10 CFR Part 20 and the requirements stipulated in Technical Specifications 3.3.3, 4.3.3, and 6.6.1, the inspector reviewed selected aspects of:

- NETL environmental monitoring program for 2013 and 2014
- Environmental monitoring release records for 2013 and 2014
- NETL Procedure No. HP00-2, "Radiation Monitoring Facility," approval dated January 23, 2013
- NETL Procedure No. HP00-3, "NETL ALARA Program," approval dated January 23, 2013
- The University of Texas at Austin, Nuclear Engineering Teaching Laboratory, 2013 Annual Report, submitted March 31, 2014
- The University of Texas at Austin, Nuclear Engineering Teaching Laboratory, 2014 Annual Report, submitted March 31, 2015

b. Observations and Findings

The program for the monitoring, storage, and release of radioactive liquid and gas met 10 CFR Part 20 requirements. The licensee appropriately monitored gaseous releases and the results were used to calculate the total activity released using a facility procedure. Records showed that gaseous releases were well within the annual dose constraint stipulated in 10 CFR 20.1101(d) and the 10 CFR Part 20, Appendix B concentrations, as well as Technical Specifications 3.3.3 limits. There were no solid or liquid radioactive material released from the facility in 2013 and 2014.

The results of the six dosimeters placed around the facility to monitor potential dose to the public were processed and the results reviewed by the inspector. The results demonstrated that the licensee was in compliance with 10 CFR Part 20 limits.

c. Conclusion

Based on the records reviewed, the effluent monitoring and release program satisfied NRC requirements.

9. Design Changes

a. Inspection Scope (IP 69001)

In order to ensure that facility changes were reviewed and approved in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.59, the inspector reviewed the following:

- UT-Reactor Oversight Committee meeting minutes and records for January 2014 through the present
- UT- Reactor Oversight Committee safety review and audit records from January 2014 to the present
- "Reactor Oversight Committee Charter," charter reviewed and reaffirmed October 22, 2007
- NETL Procedure No. ADMN-1, "NETL Procedure Control," Version 3, approval dated April 14, 2010
- NETL Procedure No. ADMN-2, "Procedures for Design Features and Quality Assurance," Rev. 1, approval dated January 31, 1992
- UT-TRIGA Log Book 2, "System Maintenance Log," documenting maintenance issues and whether or not a 50.59 review was needed
- The University of Texas at Austin, Nuclear Engineering Teaching Laboratory, 2013 Annual Report, submitted March 31, 2014
- The University of Texas at Austin, Nuclear Engineering Teaching Laboratory, 2014 Annual Report, submitted March 31, 2015

b. Observations and Findings

Through review of applicable records and interviews with licensee personnel, the inspector determined that during 2014 and to date in 2015, various changes had been initiated and/or completed at the facility. Evaluations of the changes were completed and a safety analysis was performed if needed. The inspector verified that the changes had been evaluated using the licensee's 10 CFR 50.59 review process outlined in NETL Procedure Nos. ADMN-1 and ADMN-2. The licensee's evaluations were then reviewed and approved by the UT-Reactor Oversight Committee if needed. It was noted that none of the changes required a full 10 CFR 50.59 evaluation and none required NRC approval prior to implementation.

c. Conclusion

The review and audit program satisfied Technical Specifications requirements. The changes made at the facility since the last NRC inspection had been reviewed using the 10 CFR 50.59 evaluation and had been reviewed and approved by the UT-Reactor Oversight Committee as required.

10. Committees, Audits, and Review

a. Inspection Scope (IP 69001)

In order to ensure that the audits and reviews stipulated in the requirements of Technical Specifications Section 6.2 were being completed the inspector reviewed the following:

- Responses from the licensee to safety reviews and audits
- UT-Reactor Oversight Committee meeting minutes and records for January 2014 through the present
- UT-Reactor Oversight Committee safety review and audit records from January 2014 to the present
- "Reactor Oversight Committee Charter," charter reviewed and reaffirmed October 22, 2007
- NETL Procedure No. ADMN-1, "NETL Procedure Control," Version 3, approval dated April 14, 2010
- NETL Procedure No. ADMN-2, "Procedures for Design Features and Quality Assurance," Rev. 1, approval dated January 31, 1992
- UT-TRIGA Log Book 2, "System Maintenance Log," documenting maintenance issues and whether or not a 50.59 review was needed
- The University of Texas at Austin, Nuclear Engineering Teaching Laboratory, 2013 Annual Report, submitted March 31, 2014
- The University of Texas at Austin, Nuclear Engineering Teaching Laboratory, 2014 Annual Report, submitted March 31, 2015

b. Observations and Findings

UT-Reactor Oversight Committee meeting minutes and records from January 2014 through the present were reviewed. The committee was meeting at the required frequency and a quorum was present at each meeting. The inspector verified that the membership of the committee satisfied Technical Specifications Section 6.2 requirements and that reviews and audits were being completed. The records showed that various members of the UT-Reactor Oversight Committee or other designated personnel conducted safety reviews and audits which were completed at the Technical Specifications required frequency. The topics covered by these reviews were consistent with the Technical Specifications requirements and were sufficient to provide guidance, direction, and oversight, and to ensure acceptable use of the reactor and appropriate implementation of the radiation protection program. The inspector noted that the safety reviews and audits and the associated findings were detailed and that the licensee responded and took corrective actions as needed.

c. Conclusion

The review and audit program satisfied Technical Specifications requirements.

11. Emergency Preparedness

a. Inspection Scope (IP 69001)

The inspector reviewed selected aspects of the following to verify compliance with the NETL emergency response plan:

- Emergency Plan, Rev. 3, dated December 3, 2009
- Training records for the past 2 years
- Emergency response facilities, supplies, equipment, and instrumentation
- Documentation of emergency drills and exercises held during 2013 and 2014
- Letters of Agreement with support organizations including the Austin - Travis County Emergency Medical Services, City of Austin Fire Department, and the Brackenridge Hospital
- NETL Administrative Procedure, ADMN-5, "Protection Programs," Rev. 0, approved January 24, 1992
- NETL Implementing Procedure, PLAN-0, "Call and Notification," Ver. 2.00, approved November 9, 2000, with local permanent change (Emergency Call List) dated April 10, 2012
- NETL Implementing Procedure, PLAN-E, "Emergency Response," Ver. 3.00, approved November 2, 2006, which specified the emergency equipment and supplies required to be available at the facility
- NETL Security Procedure, PLAN-S, "Physical Security," Ver. 5.00, approved November 2, 2006
- Emergency drill critiques dated June 27, 2013, February 12, 2014 and December 18, 2014

b. Observations and Findings

The emergency plan (E-Plan) in use at the reactor and emergency facilities was the same as the version most recently submitted to the NRC for approval. The inspector verified that the E-Plan and implementing procedures were being audited and reviewed biennially as required and revised as needed. The inspector verified that emergency response facilities, supplies, instrumentation, and equipment were being maintained and controlled as required in the E-Plan.

Through records review and interviews with licensee personnel, the inspector determined that emergency responders were knowledgeable of the proper actions to take in case of an emergency. Letters of agreement (LOAs) with outside response organizations were being maintained and updated biennially as required.

Emergency drills had been conducted annually as required by the E-Plan. Records indicated that off-site support organizations had participated in the facility drills at least every 2 years as required. Critiques were held following the drills to discuss the strengths and weaknesses identified during the exercises and to develop possible solutions to any problems identified. The results of these critiques were documented. Emergency preparedness and response

training for reactor staff personnel was being conducted and documented as stipulated in the E-Plan. The emergency call list was updated at least annually as stipulated in the E-Plan. The latest emergency call list was dated July 14, 2015.

c. Conclusion

The inspector concluded that the emergency preparedness program was being conducted in accordance with the emergency plan. Specifically, 1) the emergency plan and implementing procedures were being audited and reviewed biennially as required, 2) letters of agreements documenting emergency support to be provided by offsite agencies were being maintained and updated as required, 3) annual drills were being held and documentation was maintained concerning the follow-up critiques and subsequent corrective actions taken as needed, and 4) emergency preparedness training for staff personnel was being conducted as stipulated in the emergency plan.

12. Maintenance

a. Inspection Scope (IP 69001)

To determine that maintenance activities were being completed as required by Technical Specifications and procedures, the inspector reviewed:

- Technical Specifications through Amendment 4, dated May 10, 2001
- System maintenance log for 2014 through the present
- Weekly-monthly surveillance log for 2014 through the present
- Selected UT-TRIGA ICS console operation log sheets from January 2014 through the present
- NETL Maintenance Procedure, MAIN-1, "Interlock and SCRAM Features," Ver. 3.00, approved July 26, 2000
- NETL Maintenance Procedure, MAIN-2, "Instrument System Features," Ver. 3.00, approved July 26, 2000
- NETL Maintenance Procedure, MAIN-3, "Support System Features," Ver. 3.00, approved July 26, 2000
- NETL Maintenance Procedure, MAIN-4, "Area Radiation Monitors," Ver. 3.00, approved July 26, 2000
- NETL Maintenance Procedure, MAIN-5, "Fuel Inspection and Measurement," Ver. 3.00, approved July 26, 2000
- NETL Maintenance Procedure, MAIN-6, "Rod and Drive Maintenance, Inspection," Ver. 3.00, approved July 26, 2000
- NETL Operation Procedure, OPER-6, "Reactor Bay Systems," Ver. 1.00, approved April 4, 2002
- NETL Surveillance Procedure, SURV-1, "Fuel Temperature Calibration," Rev. 0, approved January 24, 1992
- NETL Surveillance Procedure, SURV-2, "Reactor Pool Power Calibration," Rev. 1, approved March 2, 2009

- NETL Surveillance Procedure, SURV-3, "Excess Reactivity and Shutdown Margin," Ver. 2.00, approved April 4, 2002
- NETL Surveillance Procedure, SURV-4, "Reactor Water Systems Surveillance," Rev. 1, approved January 22, 1991
- NETL Surveillance Procedure, SURV-5, "Air Confinement System Surveillance," Rev. 2, approved April 1, 2002
- NETL Surveillance Procedure, SURV-6, "Control Rod Calibration," Rev. 1, approved March 2, 2009
- NETL Surveillance Procedure, SURV-7 "Pulse Characteristic Comparison," Rev. 0, approved January 24, 1992
- The University of Texas at Austin, Nuclear Engineering Teaching Laboratory, 2013 Annual Report, submitted March 31, 2014
- The University of Texas at Austin, Nuclear Engineering Teaching Laboratory, 2014 Annual Report, submitted March 31, 2015

b. Observations and Findings

The inspector reviewed selected maintenance procedures and maintenance records, including the system maintenance log. The log contained maintenance information on various systems, including the reactor coolant system, the radiation monitoring system, the Instrumentation and Control System (ICS) computer, the ICS data acquisition control system, the ICS neutron monitoring (power channel) system, and the ICS rod drive system. The logs and records showed that routine and preventive maintenance was controlled and documented in the maintenance and/or operations logs consistent with licensee procedures and within the time frame specified.

c. Conclusion

The licensee's maintenance program was being implemented as required by NETL procedures.

13. Fuel Handling

a. Inspection Scope (IP 69001)

In order to verify adherence to fuel handling and inspection requirements specified in Technical Specifications Sections 3.1.4, 4.1.4, 5.3, and 5.4, the inspector reviewed:

- Selected NETL pool configuration forms
- UT-TRIGA fuel movement log and selected log sheets
- Selected core arrangement forms and fuel pin inventory forms
- Selected UT-TRIGA ICS console operation log sheets from January 2014 through the present
- The NETL core configuration map on the control room wall, dated June 2010

- NETL Fuel Procedure, FUEL-1, "Movement of Fuel," Ver. 1.00, approved February 17, 2005, with local permanent change Ver. 1.01, approved March 4, 2009, and associated forms
- NETL Fuel Procedure, FUEL-2, "Movement of Experiments," Rev. 0, approved July 30, 1991
- NETL Maintenance Procedure, MAIN-5, "Fuel Inspection and Measurement," Ver. 3.00, approved July 26, 2000, with the latest change approved April 30, 2003

b. Observations and Findings

The inspector determined that the licensee was maintaining the required records of the various fuel movements that had been completed. The inspector also determined that the fuel was being moved in compliance with procedure and the moves were being tracked and documented on the appropriate forms.

The inspector also verified that the reactor fuel was being inspected biennially as required by Technical Specifications Section 4.1.4. The most recent fuel inspection had been completed in January 2012. During this inspection the licensee had completely unloaded the reactor core in preparation for replacement of a beam port bellows which had been leaking. The IFI on beam port leak repair (IFI 50-602/2013-202) was discussed.

c. Conclusion

Reactor fuel movements and inspections were completed and documented in accordance with procedure and the fuel elements were being inspected biennially as specified by Technical Specifications.

14. **Transportation of Radioactive Material**

a. Inspection Scope (IP 86740)

To verify compliance with regulatory and procedural requirements for the transfer or shipment of licensed radioactive material, the inspector reviewed the following:

- Selected records of various radioactive material shipments for 2014 and 2015
- Training records of the staff member responsible for shipping licensed radioactive material
- Selected licenses of consignee groups or organizations, which were authorized to receive radioactive material
- NETL Procedure No. HP00-6, "Radioactive Material Control," Version 3.00, approval dated January 23, 2013

b. Observations and Findings

Through records review and discussions with licensee personnel, the inspector determined that the licensee had made various shipments of radioactive material since the previous inspection in this area. The records indicated that the radioisotope types and quantities were calculated and dose rates measured as required. The records also indicated that the packaging used was appropriate and had the appropriate markings as required. All radioactive material shipment records reviewed by the inspector had been completed in accordance with Department of Transportation and NRC regulatory requirements.

The inspector verified that the licensee maintained copies of the licenses of the various shipment consignees, which authorized them to receive and possess radioactive material. The licensee verified that the licenses were current or in timely renewal prior to initiating a shipment. The individual at the facility designated as the radioactive material "shipper" had been properly trained to do so and the appropriate documentation was on file.

c. Conclusion

Radioactive material was shipped in accordance with licensee procedures and the applicable regulations. Staff personnel assigned to ship radioactive material had received the proper training as required.

15. Exit Meeting

The inspector presented the inspection results to members of licensee management at the conclusion of the inspection on September 3, 2015. The licensee acknowledged the findings presented. The licensee did not identify as proprietary any material reviewed as part of this inspection.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

S. Biegalski	Director, NETL
M. Krause	Reactor Supervisor/Manager Operations and Maintenance
T. Tipping	Reactor Health Physicist and Laboratory Manager
M. Whaley	Associate Director, NETL
G. Kline	Senior Reactor Operator

INSPECTION PROCEDURE USED

IP 69001	Class II Non-Power Reactors
IP 86740	Inspection of Transportation Activities

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None.

Closed

None.

Discussed

50-602/2013-202	IFI	Beam Port Leak Repair
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PARTIAL LIST OF ACRONYMS USED

10 CFR	Title 10 of the <i>Code of Federal Regulations</i>
ADAMS	Agencywide Documents Access and Management System
ALARA	As Low As Reasonably Achievable
ANS	American Nuclear Society
ANSI	American National Standards Institute
ICS	Instrumentation and Control System
IFI	Inspector Follow-up Item
NETL	Nuclear Engineering Teaching Laboratory
NRC	U.S. Nuclear Regulatory Commission
ROC	Reactor Oversight Committee
UT	University of Texas