January 10, 2014

Dr. Steven Biegalski
Director, Nuclear Engineering
Teaching Laboratory
The 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. 50-602/2013-202

Dear Dr. Biegalski:

From December 9–12, 2013, 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. 50-602/2013-202). The enclosed report documents the inspection results, which were discussed on December 12, 2013, with P. Michael Whaley, Associate Director, University of Texas Nuclear Engineering Teaching Laboratory; 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 inspectors reviewed selected procedures and records, observed various activities, and interviewed personnel.

Based on the results of this inspection, the NRC has determined that one Severity Level IV violation of NRC requirements occurred. This violation is being treated as a non-cited violation (NCV), consistent with Section 2.3.2 of the Enforcement Policy. This violation is described in the subject inspection report. If you contest the violation or significance of the NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555-0001, with copies to: (1) the Director, Office of Nuclear Reactor Regulation, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and (2) the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, D.C. 20555-0001.

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 Ossy Font at (301) 415-2490 or by electronic mail at Ossy.Font@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. 50-602
License No. R-129

Enclosure:
NRC Inspection Report No. 50-602/2013-202

cc: Please see next page

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
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Dr. William Powers, Jr., President
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Mr. Roger Mulder
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P. Michael Whaley, Associate Director
Nuclear Engineering Teaching Laboratory
The University of Texas at Austin
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Austin, TX 78758

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

Should you have any questions concerning this inspection, please contact Ossy Font at (301) 415-2490 or by electronic mail at Ossy.Font@nrc.gov.

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

Docket No:	50-602
License No:	R-129
Report No:	50-602/2013-202
Licensee:	The University of Texas at Austin
Facility:	Nuclear Engineering Teaching Laboratory
Location:	Pickle Research Campus, Bldg. 159 10100 Burnet Road Austin, TX 78758
Dates:	December 9–12, 2013
Inspector:	Ossy Font Craig Bassett
Approved by:	Gregory T. Bowman, Chief Research and Test Reactors Oversight Branch Division of Policy and Rulemaking Office of Nuclear Reactor Regulation

EXECUTIVE SUMMARY

The University of Texas at Austin
Nuclear Engineering Teaching Laboratory
Report No.: 50-602/2013-202

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) review and audit and design change functions, (3) radiation protection, (4) environmental protection, (5) health physics procedures, and (6) transportation of radioactive material since the last NRC inspection in these areas, as well as a licensee-identified violation associated with implementation of the operator requalification program. The licensee's program was acceptably directed toward the protection of public health and safety and was generally in compliance with U.S. Nuclear Regulatory Commission (NRC) requirements. One Severity Level IV non-cited violation of NRC requirements was identified.

Organizational Structure and Staffing

- The organizational structure, functions, and staffing were consistent with Technical Specification (TS) requirements. Staff qualifications satisfied TS requirements.

Review and Audit and Design Change Functions

- The review and audit program satisfied TS 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.

Radiation Protection

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

Environmental Protection

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

Procedures

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

Transportation of Radioactive Materials

- 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.

Non-Cited Violation and Requalification Program

- A Severity Level IV non-cited violation was issued for the operation of the reactor by an individual with an expired operator license.

REPORT DETAILS

Summary of Plant 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 operated on several occasions at power levels up to 950 kilowatts to support ongoing experiments, research, and training.

1. Organizational Structure and Staffing

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

The inspectors reviewed the following regarding the licensee's organizational structure and functions to ensure that the requirements of Sections 6.1 and 6.6.1 of licensee's Technical Specifications (TS) 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, Annual Reports for 2011 and 2012
- 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 inspectors noted that the health physics (HP) organizational structure had not changed since the last U.S. Nuclear Regulatory Commission (NRC) inspection in this area (see Inspection Report No. 50-602/2011-201). The reactor NETL HP staff was comprised of the Reactor Health Physicist and a part-time HP technician. Organization, structure, responsibilities, and staffing were as required by TS Section 6.1. Through review of various records and discussions with personnel, the inspectors determined that the NETL staff satisfied the TS 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 HP functions at the reactor. Coordination of HP 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 TS requirements. Staff qualifications satisfied TS requirements.

2. Review and Audit and Design Change Functions

a. Inspection Scope (IP 69001)

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

- Responses from the licensee to safety reviews and audits
- UT-ROC meeting minutes and records for January 2012 through the present
- UT-ROC safety review and audit records from January 2012 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, Annual Reports for 2011 and 2012

b. Observations and Findings

(1) Review and Audit Functions

UT-ROC meeting minutes and records from January 2012 through the present were reviewed. The committee was meeting at the required frequency and a quorum was present at each meeting. The inspectors verified that the membership of the committee satisfied TS Section 6.2 requirements and that reviews and audits were being completed. The records showed that various members of the UT-ROC or other designated personnel conducted safety reviews and audits which were completed at the TS-required frequency. The topics covered by these reviews were consistent with the TS 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 inspectors noted that the safety reviews and audits and the associated findings were acceptably detailed and that the licensee responded and took corrective actions as needed.

(2) Design Change Functions

Through review of applicable records and interviews with licensee personnel, the inspectors determined that during 2012 and to date in 2013, 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 inspectors 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-ROC 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 TS 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-ROC as required.

3. Radiation Protection Program

a. Inspection Scope (IP 69001)

The inspectors reviewed selected aspects of the following to verify compliance with 10 CFR Parts 19 and 20 and TSs 3.3.3, 4.3.3, and 6.6.1:

- Dosimetry/exposure records for 2012 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. 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, Annual Reports for 2011 and 2012

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.

The licensee has identified a reactor pool leak, which appears to be coming from an experimental beam port. Leakage from the beam port is small and the liquid is being appropriately captured. The exact location of the leak will be investigated and addressed during the upcoming maintenance outage. Proper postings were in place, as well as access controls, and the leak was of a nature that facility operations were not being directly affected. The inspectors opened an Inspector Follow-up Item (IFI) 50-602/2013-202-01 in order to follow up on maintenance activities to repair the leak during a future inspection.

(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 inspectors 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 inspectors determined that the licensee reviewed the radiation protection program in 2011 as part of their license renewal. Revisions were made, the ROC 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 ROC meetings.

Radiation work permit procedures exist, but there are no active permits.

(4) Radiation Protection Training

The inspectors 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 inspectors verified that the training received was in compliance with 10 CFR Part 19 and that the training program was acceptable.

(5) Surveys

The inspectors reviewed selected weekly, monthly, quarterly, and other periodic radiation and/or contamination survey records for 2012 and 2013 and verified that HP staff completed the surveys for this time period. The inspectors closed IFI 50-602/2011-201-01, which was previously opened because of inspectors' concerns with survey practices, after reviewing these records and confirming that radiological surveys were being completed appropriately.

(6) Radiation Monitoring Equipment

The inspectors 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. Although the inspectors did not identify any instances of non-compliance associated with instrument calibration, it was identified that some radiation monitoring equipment appeared to be kept in service at the facility beyond the annual calibration period discussed in ANSI N323A, "American National Standard Radiation Protection Instrumentation Test and Calibration, Portable Survey Instruments." The inspectors discussed this with the licensee staff, who indicated that they would review their calibration practices for these instruments.

During the inspection the inspectors 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 radiation protection training were being implemented as required.

4. Environmental Protection Program

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 TSs 3.3.3, 4.3.3, and 6.6.1, the inspectors reviewed selected aspects of:

- NETL environmental monitoring program
- Environmental monitoring release records
- 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, Annual Reports for 2011 and 2012

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 TS 3.3.3 limits. There were no solid or liquid radioactive material released from the facility in 2011 and 2012.

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 inspectors. The results demonstrated that the licensee was in compliance with 10 CFR Part 20 limits.

c. Conclusions

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

5. Procedures

a. Inspection Scope (IP 69001)

The inspectors reviewed selected aspects of the following to verify compliance with TS Section 6.3 and 6.4 requirements:

- Procedural implementation
- Records of changes to NETL procedures
- Records of UT-ROC 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 TS 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. Substantial changes were likewise reviewed and approved by these individuals. It was noted that the HP procedures had all been revised and reformatted in 2013. The procedures reviewed by the inspectors had been reviewed and approved by the NETL Facility Director and the ROC as required.

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

c. Conclusion

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

6. 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 inspectors reviewed the following:

- Selected records of various radioactive material shipments
- 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

The transfer and shipment of radioactive material was reviewed. Through records review and discussions with licensee personnel, the inspectors 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 inspectors had been completed in accordance with Department of Transportation and NRC regulatory requirements.

The inspectors 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.

7. Non-Cited Violation and Requalification Program

a. Inspection Scope (IP 69001)

The inspectors reviewed selected aspects of the following to review the self-identified violation and associated implementation of the requalification program:

- UT-TRIGA Requalification Plan, Rev.1, November 1990
- UT-TRIGA Console Operation Logs Run No. 4013, December 2, 2013
- Operator Requalification Records Training Cycles 2011–2012 and 2013–2014
- ADMN-3, "Personnel and Operator Qualifications," Rev.0, September 1991
- Requalification Program Audits September 23, 2008, December 16, 2010, and March 20, 2013

b. Observations and Findings

The inspectors followed up on a licensee-identified issue associated with the operation of the UT-TRIGA reactor by an individual with an expired operator license. The inspectors determined that this issue represents a violation of 10 CFR 50.54(k), which requires that an operator licensed pursuant to 10 CFR Part 55 shall be present at the controls at all times during the operation of the facility. Specifically, the operator's license expired on November 29, 2013, and on December 2, 2013, the individual operated the reactor for 6 hours. The licensee subsequently identified that while the individual met the minimum NRC requalification requirements and had recently completed his biennial medical exam, the facility licensee had failed to submit a renewal application to the NRC. The individual was immediately removed from reactor operator duties. As a corrective action, the licensee implemented a tracking system for all items with due dates, including operator license renewals.

The inspectors determined that this issue represents a Severity Level IV violation of 10 CFR 50.54(k) based on Example 6.4.d of the NRC Enforcement Policy. This non-repetitive, licensee-identified, and corrected violation is being treated as a non-cited violation (NCV), consistent with Section 2.3.2.b of the Enforcement Policy (NCV 50-602/2013-202-02).

Additionally, during the documentation review, the inspectors identified improper implementation of the licensee's NRC-approved requalification plan. Specifically, although the licensee met the minimum requirements for training topics in 10 CFR 55.59(c), they had failed to meet facility-specific requirements in their NRC-approved requalification plan. The inspectors also identified instances where the training, examination, and sign-offs were completed shortly after the 24 month requalification program cycle ended, contrary to 10 CFR 55.59(a)(1).

Although these two issues are required to be corrected, they constitute violations of minor significance that are not subject to enforcement action in accordance with Section 2 of the Enforcement Policy. The inspectors opened IFI 50-602/2013-202-04 in order to follow up on the implementation of the licensee's NRC-approved requalification program and correction of these violations.

c. Conclusion

A Severity Level IV non-cited violation was identified for the operation of the reactor by an individual with an expired operator license. Also, two minor violations were identified and an associated IFI was opened for failure to properly implement the requalification program.

8. Exit Meeting

The inspectors presented the inspection results to members of licensee management at the conclusion of the inspection on December 12, 2013. 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

M. Krause	Reactor Supervisor/Manager Operations and Maintenance
T. Tipping	Reactor Health Physicist and Laboratory Manager
L. Welch	Engineering Research Associate and Reactor Operator
M. Whaley	Associate Director, NETL

INSPECTION PROCEDURE USED

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

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-602/2013-202-01	IFI	Reactor's experimental beam port leak maintenance activity
50-602/2013-202-02	NCV	Reactor operation by an individual with an expired operator license.
50-602/2013-202-03	IFI	Implementation of the licensee's NRC approved requalification program

Closed

50-602/2011-201-01	IFI	Follow-up on the licensee's corrective actions taken in response to the problem of poor record keeping and/or lack of attention to detail.
50-602/2013-202-02	NCV	Reactor operation by an individual with an expired operator license.

PARTIAL LIST OF ACRONYMS USED

10 CFR	Title 10 of the *Code of Federal Regulations*
ADAMS	Agencywide Documents Access and Management System
ALARA	As Low As Reasonably Achievable
ANS	American Nuclear Society
ANSI	American National Standards Institute
DDE	Deep Dose Equivalent
HP	Health Physics
IFI	Inspector Follow-Up Item
NCV	Non-Cited Violation
NETL	Nuclear Engineering Teaching Laboratory
NRC	U.S. Nuclear Regulatory Commission
ROC	Reactor Oversight Committee
RP	Radiation Protection
SDE	Shallow Dose Equivalent
TS	Technical Specifications
UT	University of Texas