September 19, 2013

Dr. Tatjana Jevremovic
Director, Utah Nuclear Engineering Program
122 S. Central Campus Drive, Room 104
University of Utah
Salt Lake City, UT 84112

SUBJECT: UNIVERSITY OF UTAH – NRC ROUTINE INSPECTION REPORT NO. 50-407/2013-201

Dear Dr. Jevremovic:

On August 26-29, 2013, the U.S. Nuclear Regulatory Commission (NRC, the Commission) conducted an inspection at your University of Utah TRIGA Reactor facility (Inspection Report No. 50-407/2013-201). The enclosed report documents the inspection results, which were discussed on August 29, 2013, with you and 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 activities, and interviewed personnel. Based on the results of this inspection, no findings of significance were identified. No response to this letter is required.

In accordance with Title 10 of the *Code of Federal Regulations* 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 Craig Bassett at (301) 466-4495 or by electronic mail at Craig.Bassett@nrc.gov.

Sincerely,

/RA/ (Patrick Isaac Acting for)

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

Docket No. 50-407
License No. R-126

Enclosure:
NRC Inspection Report No. 50-407/2013-201

cc: See next page

cc:

Mayor of Salt Lake City
451 South State
Room 306
Salt Lake City, UT 84111

Dr. Thomas Parks
Vice President for Research
201 S. Presidents Circle, Room 210
University of Utah
Salt Lake City, UT 84112-9011

Ms. Karen Langley
Director, University of Utah Radiological Health
100 OSH, University of Utah
Salt Lake City, UT 84112

Dr. Cynthia Furse
Associate Vice President for Research
210 Park, University of Utah
Salt Lake City, UT 84112

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

Director, Division of Radiation Control
Dept. Of Environmental quality
168 North 1959 West
P.O. Box 144850
Salt Lake City, UT 84114-4850

September 19, 2013

Dr. Tatjana Jevremovic
Director, Utah Nuclear Engineering Program
122 S. Central Campus Drive, Room 104
University of Utah
Salt Lake City, UT 84112

SUBJECT: UNIVERSITY OF UTAH – NRC ROUTINE INSPECTION REPORT NO. 50-407/2013-201

Dear Dr. Jevremovic:

On August 26-29, 2013, the U.S. Nuclear Regulatory Commission (NRC, the Commission) conducted an inspection at your University of Utah TRIGA Reactor facility (Inspection Report No. 50-407/2013-201). The enclosed report documents the inspection results, which were discussed on August 29, 2013, with you and 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 activities, and interviewed personnel. Based on the results of this inspection, no findings of significance were identified. No response to this letter is required.

In accordance with Title 10 of the *Code of Federal Regulations* 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 Craig Bassett at (301) 466-4495 or by electronic mail at Craig.Bassett@nrc.gov.

Sincerely,

/RA/ (Patrick Isaac Acting for)

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

Docket No. 50-407
License No. R-126

Enclosure:
NRC Inspection Report No. 50-407/2013-201

cc: See next page

DISTRIBUTION:

PUBLIC	PRTB R/F	RidsNrrDprPrta	RidsNrrDprPrtb
PBlechman	GWertz	MNorris (Lt only)	BDavis (Ltr only)

ACCESSION NO.: ML13249A172 **NRC-002**

OFFICE	NRR/DPR/PROB *	NRR/DPR/DPROB	NRR/DPR/PROB
NAME	CBassett	TLamb	***(P. Isaac for)*** GBowman
DATE	9/ 12 /13	9/ 9 / 13	9/ 19 / 13

OFFICIAL RECORD COPY

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

Docket No:	50-407
License No:	R-126
Report No:	50-407/2013-201
Licensee:	University of Utah
Facility:	TRIGA Mark-I Research Reactor Facility
Location:	Merrill Engineering Building Salt Lake City, UT
Dates:	August 26-29, 2013
Inspectors:	Craig Bassett Taylor Lamb
Approved by:	Gregory T. Bowman, Chief Research and Test Reactors Oversight Branch Division of Policy and Rulemaking Office of Nuclear Reactor Regulation

EXECUTIVE SUMMARY

University of Utah
TRIGA Mark-I Research Reactor Facility
Utah Nuclear Engineering Program
Report No.: 50-407/2013-201

The primary focus of this routine, announced inspection included onsite review of selected aspects of the University of Utah (the licensee's) 100 kilowatt Class II research reactor safety program including: 1) organizational structure and staffing, 2) review and audit and design change functions, 3) reactor operations, 4) operator requalification, 5) facility procedures, 6) fuel handling, 7) maintenance and surveillance, 8) experiments, and 9) emergency preparedness since the last U.S. Nuclear Regulatory Commission (NRC) inspection of these areas. The licensee's program was acceptably directed toward the protection of public health and safety and was in compliance with NRC requirements. No safety violations or deviations were identified.

Organizational Structure and Staffing

- The organizational structure and staffing at the facility met the requirements specified in Technical Specification Section 6.1.

- Shift staffing met the minimum requirements for reactor operations.

Review and Audit and Design Change Functions

- Review and audit functions required by Technical Specification Section 6.2 were acceptably completed by the Reactor Safety Committee or designated individuals.

- Records indicated that changes at the facility during the past year were acceptably being reviewed and in accordance with 10 CFR 50.59 and applicable licensee administrative controls.

Reactor Operations

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

Operator Requalification Program

- Operator requalification was generally conducted as required by the Requalification Program and Title 10 of the *Code of Federal Regulations* (10 CFR) Part 55.

Procedures

- Facility procedures and document reviews satisfied Technical Specification Section 6.8 requirements.

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 specified by Technical Specification Section 4.4.

Surveillance and Limiting Conditions for Operation

- Limiting conditions for operation and surveillances required by Technical Specification Sections 3.0 and 4.0 were being properly implemented.

Maintenance Logs and Records

- Maintenance activities ensured that equipment remained consistent with the Safety Analysis Report and TS requirements.

Experiments

- The program for the control of experiments satisfied regulatory requirements and license commitments.

Emergency Preparedness

- The Emergency Plan and implementing procedures were being reviewed and updated as required and were acceptable.

- Emergency response equipment was being maintained as required.

- Offsite support was acceptable and communications capabilities were adequate.

- Annual drills were being conducted as required by the Emergency Plan.

- Emergency preparedness training for staff and offsite personnel was being completed as required.

REPORT DETAILS

Summary of Plant Status

The University of Utah (the licensee's) 100 hundred kilowatt (kW) TRIGA Mark-I research and test reactor continued normal, routine operations. The reactor was generally operated in support of educational demonstrations, laboratory experiments, reactor system testing, and sample irradiations. During the inspection, the reactor was operated for operator training. It is typically operated one or two days a week at various power levels up to 90 kW.

1. Organization Structure and Staffing

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

The inspectors reviewed the following to verity that the staffing requirements, personnel responsibilities, and organizational structure specified in Section 6.1 of the licensee's Technical Specifications (TS), (as implemented through Amendment Number [No.] 9 of the Renewed Facility Operating License No. R-126, dated December 12, 2011), were being met:

- Organization and staffing for the facility
- TRIGA Operations Logbook Nos. 38 & 39
- Administrative controls and management responsibilities
- Description of Operations (DO) Procedure Manual, Section II (undated)
- Start-up and Termination Procedures and Log containing Form UNEP-001, "TRIGA Pre-start Checklist, TRIGA Start-up Checklist, and TRIGA Termination Checklist," Rev. 11, RSC approval of the form dated March 3, 2013
- The University of Utah TRIGA Reactor Annual Operating Report for the period July 1, 2010, through June 30, 2011, submitted to the U.S. Nuclear Regulatory Commission (NRC) on July 26, 2011
- The University of Utah TRIGA Reactor Annual Operating Report for the period of July 1, 2011 through June 30, 2012, submitted to the NRC July 26, 2012
- The University of Utah TRIGA Reactor Annual Operating Report for the period July 1, 2012 through June 30, 2013, submitted to the NRC on August 27, 2013

b. Observations and Findings

Through discussions with licensee representatives, the inspectors determined that designated management responsibilities at the University of Utah TRIGA Reactor (UUTR) Facility had not changed since the previous NRC inspection in August 2012 (see NRC Inspection Report No. 50-407/2012-201). The Utah Nuclear Engineering Facility (UNEF) Manager was the Director of the Utah Nuclear Engineering Program (UNEP) and was responsible for general reactor facility operation. The Reactor Supervisor (RS) was responsible for the day-to-day operation and maintenance of the facility as specified in the TS. The RS reported to the Vice President for Research of the University of Utah through the UNEF Manager.

During this inspection it was noted that the person who had been the RS had resigned from that position effective May 10, 2013. The licensee subsequently appointed a person who was a Senior Reactor Operator (SRO) at the facility as the interim RS. The inspectors reviewed this person's qualifications and verified that they were appropriate. Since that time, the licensee has hired two other people, who are currently in training as SROs, to become Reactor Supervisors.

Through review of records and logs, and through discussions with licensee personnel, the inspectors determined that the organizational structure observed at the UUTR Facility met the requirements stated in Section 6.1 of the TS. Shift staffing met the minimum requirements for reactor operations.

c. Conclusion

The organizational structure and staffing at the facility met the requirements specified in TS Section 6.1. Shift staffing met the minimum requirements for reactor operations.

2. Review, Audit, and Design Change Functions

a. Inspection Scope (IP 69001)

In order to verify that the licensee had conducted reviews and audits as required by TS Section 6.2 and to determine whether modifications to the facility were consistent with Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.59 and TS Section 6.2, the inspectors reviewed:

- Reactor Safety Committee (RSC) meeting minutes for 2011, 2012, and to date in 2013
- University of Utah UNEP Audit and Review Plan for NRC License R-126 TRIGA Nuclear Reactor (Docket No. 50-407), Revision (Rev.) 1, dated February 28, 1996
- Completed semiannual audits and reviews as documented in RSC Audit Reports for audits conducted January - June 2012 and July - December 2012 and for audits conducted January – June 2013
- DO Procedure Manual, Section II, "Organization," Part 1, "Divisional Responsibilities," (undated)
- Maintenance Procedures and Maintenance Log
- UNEP Procedure AP-001, "Guidelines for 10 CFR 50.59 Evaluations," dated August 9, 2013
- Form UNEP-022, "Maintenance Log," Rev. 4, approval dated March 3, 2011
- UNEP Job-Aid 002, "10 CFR 50.59 Screening," Rev. 1, dated August 9, 2013
- UNEP Job-Aid 003, "10 CFR 50.59 Evaluation," Rev. 1, undated
- UNEP Job-Aid 004, "10 CFR 50.59 Screener/Evaluator Designation," dated August 9, 2013
- UNEP Equipment Repair/Maintenance Report, "UUTR Water Level Scram Circuitry Repair," dated July 11, 2013

- UNEP Equipment Repair/Maintenance Report, "UUTR Ultrasonic Water Level Detector Replacement," dated August 15, 2013
- UNEP Equipment Repair/Maintenance Report, "UUTR Source Range Meter Connection Repair," dated August 15, 2013
- UNEP Equipment Repair/Maintenance Report, "UUTR Linear Power Testing Relay Repair," dated August 21, 2013
- UNEP Report on UUTR Incident, "Safety Control Rod Magnetic Coupling Failure," dated February 19, 2013
- The University of Utah TRIGA Reactor Annual Operating Report for the period July 1, 2010, through June 30, 2011, submitted to the NRC on July 26, 2011
- The University of Utah TRIGA Reactor Annual Operating Report for the period of July 1, 2011 through June 30, 2012, submitted to the NRC July 26, 2012
- The University of Utah TRIGA Reactor Annual Operating Report for the period July 1, 2012 through June 30, 2013, submitted to the NRC on August 27, 2013

b. Observations and Findings

(1) Reviews and Audits

The inspectors reviewed the RSC meeting minutes from March 2011 to the present. These meeting minutes showed that the RSC had met at the required frequency and had considered the types of topics outlined by the TS. Review of the committee meeting minutes also indicated that the RSC provided guidance and direction for safe reactor operations and ensured suitable use and oversight of the reactor.

The inspectors noted that the RSC, or individuals specifically designated by the committee, completed audits of the facility operations, programs, and procedures. Since the last NRC inspection, audits had been completed in those areas outlined in the TS. The audits were structured so that the various aspects of the licensee's operations and safety programs were reviewed semiannually. Most facility documents and plans, including the facility procedures, were reviewed annually. The Security Plan and the DO Procedure Manual were reviewed biennially. The inspectors noted that the reviews and audits and the resulting findings were detailed and that the licensee responded and took corrective actions as needed.

(2) Design Change Functions

To follow-up on an open Inspector Followup Item (IFI) that was issued during the last inspection (Inspection Report No. 50-407/2012-201, IFI No. 50-407/2012-201-01), the inspectors reviewed several changes to the facility during the past year. The licensee created a new procedure which was noted as being detailed and had easy-to-follow job-aids as a supplement. The changes made to the facility since the last inspection were well documented and a thorough evaluation was completed. As all

of the changes made to the facility did not require a 10 CFR 50.59 evaluation, the inspectors noted that the RSC did not need to review the series of documents listed above as required in the facility TS.

During the review of licensee documents, the inspectors noted that the licensee did not review any previous changes at the facility to ensure that a license amendment was not required. Therefore, IFI No. 50-407/2012-201-01 will remain open to ensure the licensee's commitment is met to continue to effectively perform 10 CFR 50.59 screenings and evaluations, as well as their commitment to review major changes made to the facility in recent years that did not have a sufficient evaluation.

c. Conclusion

Review and oversight functions required by TS Section 6.5 were acceptably completed by the RSC. Records indicated that changes at the facility during the past year were acceptably being reviewed and in accordance with 10 CFR 50.59 and applicable licensee administrative controls.

3. Operations

a. Inspection Scope (IP 69001)

The inspectors reviewed selected aspects of the following to ensure that the operations program was being implemented as required in TS Sections 3.0, 4.0, and 6.0:

- Daily Checkout Logbook
- TRIGA Operations Procedures and Logbook Nos. 38 & 39
- Maintenance Procedures and Maintenance Log
- UNEP Startup and Termination Procedures and Log (STL)
- Selected Surveillance data sheets, records, and tests
- DO Procedure Manual (undated)
- Form UNEP-001, "TRIGA Pre-Start Checklist," Rev. 11, approval dated March 3, 2011
- The University of Utah TRIGA Reactor Annual Operating Report for the period July 1, 2010 through June 30, 2011, submitted to the NRC on July 26, 2011
- The University of Utah TRIGA Reactor Annual Operating Report for the period July 1, 2011 through June 30, 2012, submitted to the NRC on July 26, 2012
- The University of Utah TRIGA Reactor Annual Operating Report for the period July 1, 2012 through June 30, 2013, submitted to the NRC on August 27, 2013

b. Observations and Findings

On Wednesday, August 28, 2013, the inspectors observed a reactor startup in support of operator training and verified compliance with the appropriate written procedures and TS requirements. During the inspection, the inspectors also

conducted observations of routine activities and reviewed the UUTR console log books, monthly and daily surveillance check sheets, and operation record forms. It was noted that the operators on duty were knowledgeable and proficient while the operators in training were astute and followed instruction.

The inspectors verified that the reactor operating characteristics, and other procedurally required entries, were logged appropriately and that the checklists were completed. A review of the licensee's logs and records indicated that the TS operational limits had not been exceeded and that, as noted previously, shift staffing met the minimum requirements.

c. Conclusion

Operational activities were consistent with applicable TS and procedural requirements.

4. Operator Licenses, Requalification, and Medical Activities

a. Inspection Scope (IP 69001)

To verify that the operator requalification activities and training were conducted in accordance with the NRC-approved Operator Requalification Program contained in the Safety Analysis Report (SAR) and other regulatory requirements, the inspectors reviewed selected aspects of:

- TRIGA Operations Logbook Nos. 38 & 39
- SAR Chapter 12 Section 9, "Operator Training and Requalification"
- Requalification Training Records for the past four years
- Medical examination records for the past four years
- UUTR Operator Termination Records for the past year
- Form UNEP-017, "Familiarization Checksheet," Rev. 3, approval dated March 3, 2011
- Form UNEP-025, "Requalification Program Progress Checklist," Rev. 3, dated August 6, 2013

b. Observations and Findings

Current NRC-licensed staff consisted of four SROs. As of the date of the inspection, two of the operators' licenses were current. One operator was in remediation due to the need for an updated NRC Form 396, "Certification of Medical Examination by Facility Licensee." The fourth operator does not currently work at the facility but, during an interview with the licensee, it was understood that the operator may return on a temporary basis following remediation. The two operators working at the facility were current in their qualifications and were enrolled in the licensee's NRC-approved requalification and training program. The inspectors verified that they had completed the minimum required hours per quarter of operating the reactor. The inspectors noted that those operators were receiving the required biennial medical examinations.

The licensee's requalification program included requirements for an annual operating test and a biennial written examination. The inspectors verified that both examinations were administered at the specified frequency and that the level of difficulty was comparable to that of NRC-administered examinations. The inspectors confirmed that the requalification program was being administered in a manner that sufficiently maintains the qualifications and proficiency of the licensed operators currently working at the facility.

c. Conclusion

Operator requalification was generally conducted as required by the licensee's Operator Requalification Program and 10 CFR Part 55.

5. Procedures and Procedural Compliance

a. Inspection Scope (IP 69001)

To verify that facility procedures were being reviewed, revised, and implemented as required by TS Section 6.4, the inspectors reviewed various aspects of:

- Selected forms and checklists
- DO Procedure Manual, Sections II and III (undated)
- Selected operating and administrative procedures and logs
- Procedural reviews and updates documented in the RSC meeting minutes for the past two years

b. Observations and Findings

The licensee's procedures were found to be acceptable for the current facility status and staffing level. The inspectors noted that the procedures specified the responsibilities of the various members of the staff as well as the RSC. The procedures were being audited and/or reviewed annually, as noted earlier, and were updated as needed. It was also noted that substantive revisions to procedures, checklists, and forms were required to be presented to the RSC for review and approval as required by TS. The inspectors verified that the latest revisions to various procedures and forms had been through this review and approval process as required.

It also was noted that the licensee was in the process of revising various procedures including the Description of Operations Procedure Manual. Because this process was ongoing during the inspection, the licensee was informed that the issue of procedure revision will be considered as an Inspectors Follow-up Item and will be reviewed during subsequent inspections (IFI 50-407/2013-201-01).

c. Conclusion

Facility procedures and document reviews satisfied TS Section 6.8 requirements.

6. Fuel Movement and Handling

a. Inspection Scope (IP 69001)

The inspectors reviewed selected aspects of the following in order to verify adherence to fuel handling and inspection requirements specified in TS Sections 3.1, 4.1, 5.3, and 5.4 and the applicable procedures:

- Core Procedures and Log
- TRIGA Operations Logbook Nos. 38 & 39
- Heavy Water Element Inspection Forms
- Criticality calculations for various storage locations
- University of Utah TRIGA Reactor Core (element location sheet), Core Configuration 24B, last updated February 22, 2013
- Fuel Procedures and Logs for Stainless Steel and Aluminum clad fuel elements
- Form UNEP-004, "Biennial Fuel Rod Inspection," Rev. 2, RSC approval of the form dated March 3, 2013
- Form UNEP-005, "Core Change and Critical Fuel Loading," Rev. 5, RSC approval of the form dated March 3, 2013
- Form UNEP-018, "Fuel Element Inventory Sheet," RSC approval of the form dated March 3, 2013
- DO Procedure Manual, Section IV, "Reactor Operations," (undated)
- The University of Utah TRIGA Reactor Annual Operating Report for the period July 1, 2010, through June 30, 2011, submitted to the NRC on July 26, 2011
- The University of Utah TRIGA Reactor Annual Operating Report for the period of July 1, 2011 through June 30, 2012, submitted to the NRC on July 26, 2012
- The University of Utah TRIGA Reactor Annual Operating Report for the period July 1, 2012 through June 30, 2013, submitted to the NRC on August 27, 2013

b. Observations and Findings

The inspectors determined that the licensee was maintaining the required records of the various fuel movements that had been completed and verified that the movements conducted and recorded were in compliance with the procedure. The latest core reconfiguration was completed in December 2003 and the resulting University of Utah TRIGA core and fuel positioning was designated as Core Configuration 24B. The core has remained in that configuration since and was last verified on February 22, 2013.

Core loading procedures provided a specific method to move and handle fuel consistent with the requirements and provisions of the TS Section 4.4 and the licensee safety analyses. Fuel movement and fuel examination records showed that the fuel of the current core was moved in accordance with procedures and examined biennially as required. The fuel elements were last inspected in

December 2011. It was also noted that fuel handling tools were controlled and secured when not in use. The procedures and the controls specified for these operations were acceptable.

c. Conclusion

Reactor fuel movements and inspections were completed and documented in accordance with applicable procedures and the fuel was being inspected as specified by TS Section 4.4.

7. Surveillance and Limiting Conditions for Operation

a. Inspection Scope (IP 69001)

To verify that the licensee had conducted its surveillance program in accordance with TS requirements, the inspectors reviewed:

- Daily Checkout Logbook
- TRIGA Operations Procedures and Logbook Nos. 38 & 39
- UNEP Startup and Termination Procedures and Log (STL)
- Description of Operations Procedure Manual (undated)
- UNEP Job-Aid 001, "Reactor Supervisor Periodic Calendar," Rev. 1, dated August 22, 2013
- Form UNEP-001, "TRIGA Pre-Start Checklist," Rev. 11, approval dated March 3, 2011
- Form UNEP-002, "Biennial Control Rod Inspection/Control Rod Movement or Repair," Rev. 3, approval dated March 3, 2011
- Form UNEP-003, "Semi-Annual Control Rod Calibration," Rev. 8, approval dated March 3, 2011
- Form UNEP-009, "Tank Inspection Procedure," Rev. 3, approval dated March 3, 2011
- Form UNEP-011, "Calibration of Temperature Monitoring Channels," Rev. 3, approval dated March 3, 2011
- Form UNEP-012, "Semi-Annual Thermal Power Calibration," Rev. 4, approval dated March 3, 2011
- Form UNEP-020, "Monthly Inspection Checklist," Rev. 12, approval dated April 2, 2004
- Form UNEP-022, "Maintenance Log," Rev. 4, approval dated March 3, 2011
- Form UNEP-036, "Calibration of pH Meter," Rev. 0, approval dated March 3, 2011
- The University of Utah TRIGA Reactor Annual Operating Report for the period July 1, 2010 through June 30, 2011, submitted to the NRC on July 26, 2011
- The University of Utah TRIGA Reactor Annual Operating Report for the period July 1, 2011 through June 30, 2012, submitted to the NRC on July 26, 2012
- The University of Utah TRIGA Reactor Annual Operating Report for the period July 1, 2012 through June 30, 2013, submitted to the NRC on August 27, 2013

b. Observations and Findings

Daily, weekly, monthly and other periodic checks, tests, and verifications for TS required Limiting Conditions for Operation (LCOs) were being completed as required. The inspectors performed a random sampling of the UUTR required surveillances and verified 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.

During the inspection, one of the inspectors accompanied licensee representatives on the required monthly surveillance. This included radiation surveys, ventilation system checks, continuous stack monitor checks, as well as various other items per TS requirements. The inspector noted that the RS and the person helping were proficient and thorough.

c. Conclusion

The program for surveillance and LCOs confirmation was implemented in accordance with TS Section 3.0 and 4.0 requirements.

8. Maintenance Logs and Records

a. Inspection Scope (IP 69001)

To verify that the licensee's operational and maintenance activities have remained consistent with regulatory requirements since the last inspection, the inspectors reviewed selected aspects of:

- Daily Checkout Logbook
- TRIGA Operations Procedures and Logbook Nos. 38 & 39
- Maintenance Procedures and Maintenance Log
- Description of Operations Procedure Manual (undated)
- UNEP Equipment Repair/Maintenance Report, "UUTR Water Level Scram Circuitry Repair," dated July 11, 2013
- UNEP Equipment Repair/Maintenance Report, "UUTR Ultrasonic Water Level Detector Replacement," dated August 15, 2013
- UNEP Equipment Repair/Maintenance Report, "UUTR Source Range Meter Connection Repair," dated August 15, 2013
- UNEP Equipment Repair/Maintenance Report, "UUTR Linear Power Testing Relay Repair," dated August 21, 2013
- UNEP Report on UUTR Incident, "Safety Control Rod Magnetic Coupling Failure," dated February 19, 2013
- The University of Utah TRIGA Reactor Annual Operating Report for the period July 1, 2010 through June 30, 2011, submitted to the NRC on July 26, 2011
- The University of Utah TRIGA Reactor Annual Operating Report for the period July 1, 2011 through June 30, 2012, submitted to the NRC on July 26, 2012

- The University of Utah TRIGA Reactor Annual Operating Report for the period July 1, 2012 through June 30, 2013, submitted to the NRC on August 27, 2013

b. Observations and Findings

The inspectors reviewed the maintenance records related to 2011, 2012, and 2013 scheduled and unscheduled preventive and corrective maintenance activities. Routine and preventive maintenance was well controlled and documented in a tracking system called DevonWay. A review of the UUTR Maintenance Procedures and Log indicated that all maintenance activities were consistent with the requirements of 10 CFR 50.59. After all maintenance items were completed, system operational checks were performed to ensure the affected systems were operable before returning them to service.

c. Conclusion

Maintenance activities ensured that equipment remained consistent with the Safety Analysis Report and TS requirements.

9. Experiments

a. Inspection Scope (IP 69001)

The inspectors reviewed selected aspects of the following in order to verify that experiments were being conducted within the controls specified in TS Secitons 3.8, 4.8, and 6.5, and approved guidelines:

- TRIGA Operations Logbook Nos. 38 & 39
- Experimental Procedures and Log
- Survey and control of irradiated items
- Selected TRIGA Reactor Irradiation Request and Performance forms documented on Form UNEP-027, “TRIGA Reactor Irradiation Request and Performance,” Rev. 6, RSC approval of the form dated March 3, 2013
- The current authorized experiment documented on University of Utah TRIGA Reactor Experiment Authorization Form, RSC approval of the form dated February 20, 1981, Authorization Number 4-05-2013, classified as I-Routine, with an approval by the Reactor Supervisor dated April 8, 2011
- DO Procedure Manual, Section VI, “Experiment Methods,” (undated)
- The University of Utah TRIGA Reactor Annual Operating Report for the period July 1, 2010, through June 30, 2011, submitted to the NRC on July 26, 2011
- The University of Utah TRIGA Reactor Annual Operating Report for the period of July 1, 2011 through June 30, 2012, submitted to the NRC July 26, 2012
- The University of Utah TRIGA Reactor Annual Operating Report for the period July 1, 2012 through June 30, 2013, submitted to the NRC on August 27, 2013

b. Observations and Findings

In the past, there have been various experiments conducted at the facility. During this inspection, the inspectors noted that no new experiments had been initiated, reviewed, or approved since the last inspection. The inspectors also noted that currently there is only one authorized and approved experiment classified as a Routine-I experiment. The inspectors verified that a new Experiment Authorization (EA) for that experiment was being completed and approved every year as required. The experiment was very broad in scope and included irradiation of: 1) biological samples and materials, tailings, plastics, and metals for NAA, 2) FTA standards and materials, 3) isotopes for the production of medical tracers, and 4) electronics and materials to include dosimeters.

The irradiations completed under the approved experiment were conducted under the cognizance of the RS and an SRO as required. The results of the irradiations were documented in the TRIGA Operations Logbook and on the irradiation request forms. The inspectors noted that experiments were conducted in accordance with procedural and EA guidelines and that materials produced were controlled as required by the radiation protection program.

During a recent RSC audit the auditor noted that the evaluation upon which the current routine activation experiment is based could not be located. In response the licensee committed to develop a new/revised evaluation which would be ready for approval at the next RSC meeting. Since this evaluation had not been completed at the time of the inspection, the licensee was informed that the issue of developing an evaluation for the current authorized experiment would be followed by the NRC as an IFI and would be reviewed during a subsequent inspection (IFI 50-407/2013-201-02).

c. Conclusion

The license's program for conducting experiments and controlling products satisfied regulatory requirements and license commitments.

10. Emergency Preparedness

a. Inspection Scope (IP 69001)

To verify that the licensee was implementing and complying with the “University of Utah, Utah Nuclear Engineering Program (UNEP) Emergency Plan for NRC License R-126: TRIGA Nuclear Reactor,” Rev. 8, dated July 20, 2011, the inspectors reviewed selected aspects of:

- Training records for staff and offsite support personnel
- Documentation of emergency drills for 2011, 2012, and 2013
- Emergency response supplies, equipment, and instrumentation
- Selected Emergency (Implementing) Procedures
- UNEP Annual Emergency Training Attendance Record forms for 2011, 2012, and 2013

- Form UNEP-015, “Emergency Kit Check,” Rev. 4, RSC approval of the form dated March 3, 2013
- Form UNEP-021, “UNEP Emergency Call List,” Rev. 25, RSC approval of the form dated May 9, 2013
- Form UNEP-037, “Radiological Emergency Classification Checklist,” RSC approval of the form dated March 3, 2013
- Letter of Agreement with Gold Cross Ambulance, dated April 8, 1993

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 reviewed by the NRC. The E-Plan was last audited and reviewed in September 2013. Implementing procedures were reviewed and revised as needed. Supplies, instrumentation and equipment were being maintained as required in the E-Plan.

Emergency drills had been conducted annually as required. Critiques were required to be prepared following each drill. Training for reactor staff and support personnel was acceptable and was conducted and documented as required.

According to the licensee, agreements with various offsite response organizations, such as the fire department and the hospital, were being maintained between those entities and the University. Therefore, the reactor facility did not need or maintain separate agreements with these groups in addition to those already established with the University. It was noted that communications capabilities with these support groups were acceptable and were tested periodically.

As part of the inspection, the inspectors visited the Salt Lake City Fire Department (SLCFD) fire station that would respond to the facility in case of emergency. The inspectors interviewed SLCFD personnel at Station No. 10 and observed the supplies and equipment at the support site that would be available in the event of a problem. There appeared to be a good working relationship between the licensee and this support organization.

c. Conclusion

The emergency preparedness program was being implemented adequately as evidenced by the following: 1) the Emergency Plan and Implementing Procedures were being reviewed and updated as required and were acceptable, 2) emergency response equipment were being maintained as required, 3) annual drills were being conducted as required by the Emergency Plan, 4) emergency preparedness training for staff and offsite personnel was being completed as required, and 5) offsite support was acceptable and communications capabilities were adequate

.

11. Exit Interview

The inspection scope and results were summarized on August 29, 2013, with licensee representatives. The inspectors discussed the findings for each area reviewed. The licensee acknowledged the findings and did not identify as proprietary any of the material provided to or reviewed by the inspectors during the inspection.

PARTIAL LIST OF PERSONS CONTACTED

Licensee Personnel

J. Engler	Reactor Supervisor (In Training)
T. Jevremovic	Director of the Utah Nuclear Engineering Program and Reactor Administrator
G. Moffitt	Reactor Supervisor and Senior Reactor Operator
R. Schow	Reactor Supervisor (In Training)

Other Personnel

G. Barraclough	Captain, Station No. 10, Salt Lake City Fire Department

INSPECTION PROCEDURE USED

IP 69001	Class II Research and Test Reactors
IP 92701	Review of Previously Identified Items

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-407/2013-201-01	IFI	Follow-up on the licensee's efforts to revise various procedures including the Description of Operations Procedure Manual.
50-407/2013-201-02	IFI	Follow-up on the development of an evaluation for the one experiment that is currently authorized to be conducted at the facility.

Discussed

50-407/2012-201-01	IFI	Follow-up on the appropriate implementation of 10 CFR 50.59 for facility design changes.

Closed

None

LIST OF ACRONYMS USED

10 CFR	Title 10 of the *Code of Federal Regulations*
DO	Description of Operations
E-Plan	Emergency Plan
EA	Experiment Authorization
IFI	Inspector Followup Item
IP	Inspection Procedure
IR	Inspection Report

kW	Kilowatt
LCO	Limiting Condition of Operation
No.	Number
NRC	U.S. Nuclear Regulatory Commission
Rev.	Revision
RS	Reactor Supervisor
RSC	Reactor Safety Committee
SAR	Safety Analysis Report
SLCFD	Salt Lake City Fire Department
SRO	Senior Reactor Operator
STL	Startup and Termination Procedures and Log
TS	Technical Specifications
UNEF	Utah Nuclear Engineering Facility
UNEP	Utah Nuclear Engineering Program
UUTR	University of Utah TRIGA Reactor