July 27, 2007

Dr. Melinda Krahenbuhl
Director of CENTER
122 S. Central Campus Drive, Room 104
University of Utah
Salt Lake City, UT 84112

SUBJECT: NRC INSPECTION REPORT NO. 50-407/2007-201

Dear Dr. Krahenbuhl:

This letter refers to the inspection conducted on July 16-19, 2007, at your TRIGA Mark-I research reactor facility located in the Center for Excellence in Nuclear Technology, Energy, and Research (CENTER). The enclosed report documents the inspection results, which were discussed on July 19, 2007, with Dr. Ronald Pugmire, Associate Vice President for Research, Dr. Paul Tikalsky, Chair of the Civil and Environmental Engineering Department, you and another member of your staff.

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

In accordance with Section 2.390, "Public inspections, exemptions, and requests for withholding," of Title 10 of the *Code of Federal Regulations*, 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 Publicly Available Records component of NRC's 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 404-358-6515.

Sincerely,

/RA/

Johnny H. Eads, Jr., Branch Chief
Research and Test Reactors Branch B
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

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

Enclosure: NRC Inspection Report No. 50-407/2007-201
cc w/encl.: Please see next page

cc:

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ACCESSION NO.: ML072070529 **TEMPLATE #: NRR-106**

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DATE	07/ /2007	07/26/2007	07/27/2007

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

Docket No:	50-407
License No:	R-126
Report No:	50-407/2007-201
Licensee:	University of Utah
Facility:	TRIGA Mark-I Research Reactor Facility Center for Excellence in Nuclear Technology, Energy, and Research (CENTER)
Location:	Merrill Engineering Building Salt Lake City, UT
Dates:	July 16-19, 2007
Inspector:	Craig Bassett
Approved by:	Johnny H. Eads, Jr., Branch Chief Research and Test Reactors Branch B Division of Policy and Rulemaking Office of Nuclear Reactor Regulation

EXECUTIVE SUMMARY

University of Utah
TRIGA Mark-I Research Reactor Facility
Center for Excellence in Nuclear Technology, Energy, and Research (CENTER)
Report No.: 50-407/2007-201

The primary focus of this routine, announced inspection included onsite review of selected aspects of the University of Utah CENTER TRIGA Mark-I research reactor safety programs including: organizational structure and staffing, review and audit and design control functions, reactor operations, operator requalification, facility procedures, fuel handling, maintenance and surveillance, experiments, and emergency preparedness since the last NRC inspection of these areas. The licensee's programs were acceptably directed toward the protection of public health and safety and were in compliance with NRC requirements. No safety concerns or violations of regulatory requirements were identified.

Organizational Structure and Staffing

- The organizational structure and staffing at the facility met the requirements specified in Technical Specification Sections 6.1, 6.2, and 6.3.

Review and Audit and Design Control Functions

- Review and oversight functions required by Technical Specification Section 6.5 were acceptably completed by the Reactor Safety Committee.

- Changes made at the facility had been reviewed and approved in accordance with 10 CFR 50.59.

Operations

- Reactor operations and logs were acceptable and in accordance with procedural and Technical Specification requirements.

Operator Requalification Program

- The requalification/training program was being acceptably maintained and was up-to-date.

- Medical examinations were being completed biennially as required.

Procedures

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

- Procedural compliance was acceptable.

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.

Maintenance and Surveillance

- Maintenance was being completed as required.

- The program for completing surveillance checks and Limiting Conditions of Operation confirmations was being implemented in accordance with Technical Specifications 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 biennially as required and were acceptable.

- Emergency response facilities and equipment were being maintained as required and responders were knowledgeable of proper actions to take in case of an emergency.

- Offsite support was acceptable and communications capabilities were adequate.

- Annual drills were being conducted and critiques were being held 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 licensee's Class II one hundred kilowatt TRIGA Mark-I research and test reactor continued normal, routine operations. The reactor was typically operated in support of sample irradiations, reactor system testing and surveillances, and operator training. During this inspection, the reactor was operated for demonstration purposes.

1. Organization Structure and Staffing

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

The inspector reviewed the following to verity that the staffing requirements, personnel responsibilities, and organizational structure specified in Sections 6.1, 6.2, and 6.3 of the licensee's Technical Specifications (TS), Amendment No. 7, dated June 23, 1999, were being met and maintained:

- organization and staffing for the facility
- TRIGA Operations Log Numbers (Nos.) 36 and 37
- administrative controls and management responsibilities
- Description of Operations Procedure Manual, Section II, "Organization and Responsibilities," (undated)
- Annual Operating Report for the University of Utah TRIGA Nuclear Reactor for the period of July 1, 2005 through June 30, 2006
- Annual Operating Report for the University of Utah TRIGA Nuclear Reactor for the period of July 1, 2006 through June 30, 2007
- American National Standards Institute/American Nuclear Society (ANSI/ANS) Standard 15.1, "Development of Technical Specifications for Research Reactors," dated December 7, 1990
- ANSI/ANS Standard 15.4, "Selection and Training of Personnel for Research Reactors," dated June 9, 1988

b. Observations and Findings

Through discussions with licensee representatives, the inspector determined that management responsibilities and the organization at the University of Utah TRIGA Mark-I Reactor Facility had not changed since the previous NRC inspection in April 2006 (see Inspection Report No. 50-407/2006-201). It was noted that the organization responsible for the reactor was also known as the Center for Excellence in Nuclear Technology, Energy, and Research (CENTER). The Reactor Supervisor retained direct control and overall responsibility for safe operation and maintenance of the facility as specified in the TS. The Reactor Supervisor reported to the President of the University of Utah through the Reactor Administrator.

The licensee's current operational organization consisted of the Reactor Administrator and the Reactor Supervisor. These individuals were also qualified Senior Reactor Operators (SROs). In addition, there were two graduate students who were SROs. Four other students were involved in, or were being considered for, the operator

training program. The Reactor Administrator and the Reactor Supervisor positions were full-time positions while all the others were part-time.

The organizational structure was as required by TS and was consistent with that specified in the ANSI Standard ANS 15.1, "Development of Technical Specifications for Research Reactors." Qualifications of the staff met TS requirements and were consistent with those specified in the ANSI Standard ANS 15.4, "Selection and Training of Personnel for Research Reactors."

c. Conclusions

The organizational structure and staffing at the facility met the minimum requirements specified in TS Sections 6.1, 6.2, and 6.3.

2. Review, Audit, and Design Change Functions

a. Inspection Scope (IP 69001)

In order to verify that the licensee had established and conducted reviews and audits as required and to determine whether modifications to the facility were consistent with 10 CFR 50.59 and TS Section 6.5, the inspector reviewed:

- Reactor Supervisor Quarterly Reports for the past two years
- Reactor Administrator Quarterly Reports for the past two years
- Radiation Safety Officer Quarterly Reports for the past two years
- Reactor Safety Committee meeting minutes for 2006 to the present
- Audit and Review Plan for the University of Utah TRIGA Reactor for the past two years
- Reactor Safety Committee Charter, dated June 11, 1997 and reviewed June 3, 1999
- Completed audits and reviews as noted on Form CENTER-035, Revision (Rev.) 1, "Audit and Review Program Checklist," Reactor Safety Committee (RSC) approval dated June 9, 1993 - checklists for audits conducted January - June 2006 and July - December 2006
- Description of Operations Procedure Manual, Section II, "Organization and Responsibilities," (undated)
- 10 CFR 50.59 Review, "Replacement of the Crane Hoist in the Reactor Room," dated June 2005
- 10 CFR 50.59 Review, "Replacement of the Concrete Cap for the TRIGA Reactor," dated April 2007
- Annual Operating Report for the University of Utah TRIGA Nuclear Reactor for the period of July 1, 2005 through June 30, 2006
- Annual Operating Report for the University of Utah TRIGA Nuclear Reactor for the period of July 1, 2006 through June 30, 2007

b. Observations and Findings

(1) Reviews and Audits

The inspector reviewed the Reactor Safety Committee's (RSC's) meeting minutes from January 2006 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 inspector noted that the RSC, or an individual 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. Major facility documents and plans, including the facility procedures, were reviewed biennially. The inspector noted that the audits and the resulting findings were detailed and that the licensee responded and took corrective actions as needed.

(2) Design Change Functions

The inspector reviewed recent changes made at the facility. Records of a change made in 2005, and review of the steps taken to implement the change, showed that the design control program at the facility was being followed. Two SROs evaluated the proposed modification and made a recommendation to proceed. Subsequently, the Reactor Supervisor reviewed the proposed modification and determined that no safety or TS concern existed. The change resulted in the installation of a new crane hoist used in conjunction with the reactor. The inspector noted that a 2007 change also had been acceptably documented in accordance with 10 CFR 50.59 and applicable licensee requirements. That change resulted in the installation of a new rubber cap to replace the concrete that covered the sand that filled the space between the aluminum and stainless steel tanks which surround the reactor.

Neither of the changes constituted a safety question, was deemed to increase the possibility of an accident or malfunction not previously evaluated, or required a change to the facility Technical Specifications. Due to the nature of the changes, they were not required to be reviewed and approved by the RSC. However, courtesy copies of the Safety Evaluations for these two projects were given to the RSC for review.

c. Conclusions

Review and oversight functions required by TS Section 6.5 were acceptably completed by the RSC. Changes made at the facility had been reviewed and approved in accordance with facility procedures and the guidance of 10 CFR 50.59.

3. Operations

a. Inspection Scope (IP 69001)

The inspector reviewed selected aspects of the following to verify operation of the reactor in accordance with TS Sections 2, 3, 4, and 6:

- organization and staffing for the facility
- Start-up and Termination Procedures and Log
- Maintenance Procedures and Maintenance Log
- selected surveillance data sheets, records, and tests
- TRIGA Operations Procedures and Log Nos. 36 and 37
- administrative controls and management responsibilities
- Form CENTER-001, Rev. 10, "TRIGA Pre-start Checklist, TRIGA Start-up Checklist, and TRIGA Termination Checklist," RSC approval dated April 2, 2004
- Description of Operations Procedure Manual, Section IV, "Reactor Operations," (undated)
- Description of Operations Procedure Manual, Section VII, "TRIGA Reactor Console," (undated)
- Annual Operating Report for the University of Utah TRIGA Nuclear Reactor for the period of July 1, 2005 through June 30, 2006
- Annual Operating Report for the University of Utah TRIGA Nuclear Reactor for the period of July 1, 2006 through June 30, 2007

b. Observations and Findings

The inspector reviewed the operations log from December 2003 through the present. The inspector also reviewed TRIGA Pre-start, Start-up and Termination Checklists and Monthly Checklists. Additionally, the inspector observed a reactor start-up, steady state operation, and termination of operations on July 18, 2007. Reactor operations were carried out in accordance with written procedures as required by TS Section 6.8.

Information on the operational status of the facility was recorded accurately in the log book or on the required checklists as stipulated by Section 6.9 of the facility TS. The inspector verified that, according to the data recorded, TS operational limits had not been exceeded as stipulated in TS Sections 2, 3, and 4. Scrams were identified in the logs, were reported as required, and were resolved before the resumption of operations. Through interviews with operators, the inspector confirmed that shift staffing met the minimum requirements for duty and on-call personnel as required by TS Section 6.3.

c. Conclusions

Based on the procedures and records reviewed, and observations made during the inspection, the inspector determined that reactor operations and logs were acceptable and in accordance with procedural and TS requirements.

4. Operator Licenses, Requalification, and Medical Activities

a. Inspection Scope (IP 69001)

To determine that operator requalification activities and training were conducted as required by the "University of Utah Center for Excellence in Nuclear Technology, Engineering, and Research Reactor Operator Requalification Plan," Rev. 3, dated February 1996, and that medical requirements were met, the inspector reviewed:

- TRIGA Operations Log Nos. 36 and 37
- medical examination records for the past four years
- status of licenses of those operators who routinely operated the reactor
- Form CENTER-001, Rev. 10, "TRIGA Pre-start Checklist, TRIGA Start-up Checklist, and TRIGA Termination Checklist," RSC approval dated April 2, 2004
- operator requalification status documented on Form CENTER-025, "University of Utah Center for Excellence in Nuclear Technology, Engineering, and Research Reactor Requalification Program Progress Checklist," (no RSC approval date listed) which included reactivity manipulations, written examinations, training and lectures, and SRO duty
- ANSI/ANS Standard 15.4, "Selection and Training of Personnel for Research Reactors," dated June 9, 1988

b. Observations and Findings

As noted previously, there were four qualified SROs at the facility. The operators' licenses were found to be current. A review of facility logs and records showed that training continued to be conducted in accordance with the licensee's requalification and training program. Lectures had been given as stipulated and training reviews and examinations had been completed and documented. Records of quarterly reactor operations, reactivity manipulations, and other operations and supervisory activities were maintained and the required activities completed by each operator. Records indicating the completion of the annual operations tests and supervisory evaluations were also maintained. Biennial written examinations had been completed by the operators as required as well.

The inspector noted that the operators were also receiving the required biennial medical examinations as specified by the program. The inspector visited the medical doctor who routinely performed the physical examinations for the various reactor operators. The doctor was complying with the requirements specified in ANSI Standard ANS 15.4, "Selection and Training of Personnel for Research Reactors."

During the inspection, it was also noted that one SRO had not completed the four hours per quarter of reactor operation for the past two quarters (as required by the Requalification Program). The licensee was aware of the issue and indicated that that operator would not be allowed to operate the reactor until the operator was certified by the Reactor Supervisor (RS). This was to be accomplished by the operator serving six hours of shift duty under the supervision of the RS as stipulated in the Requalification

Program. The licensee was informed that this issue will be noted by the NRC as an Inspector Follow-up Item (IFI) and will be reviewed during a future inspection (IFI 50-407/2007-201-01).

c. Conclusions

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

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 6.8, the inspector reviewed selected aspects of:

- selected forms and checklists
- selected operating and administrative procedures and logs
- procedural reviews and updates documented in the RSC meeting minutes for the past two years
- Description of Operations Procedure Manual, Section II, “Organization and Responsibilities,” (undated)
- Description of Operations Procedure Manual, Section III, “Documentation,” (undated)

b. Observations and Findings

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

The inspector observed the completion of the Pre-start, Start-up, and Termination Checklists for operation on July 18, 2007. It was noted that the required checks and verifications were completed in accordance with the applicable procedure.

c. Conclusions

Facility procedures and document reviews satisfied TS Section 6.8 requirements. Procedural compliance was acceptable.

6. Fuel Movement and Handling

a. Inspection Scope (IP 69001)

The inspector reviewed selected aspects of the following in order to verify adherence to fuel handling and inspection requirements specified in TS Section 4.4 and the applicable procedures:

- Core Procedures and Log
- TRIGA Operations Log Nos. 36 and 37
- Heavy Water Element Inspection Forms
- Criticality calculations for various storage locations
- University of Utah TRIGA Reactor Core (element location sheet), Core Configuration 24B, dated November 17, 2004
- Fuel Procedures and Log for Stainless Steel and Aluminum clad fuel elements
- Form CENTER-004, Rev. 1, “Biennial Fuel Rod Inspection,” RSC approval dated December 17, 1997
- Form CENTER-005, Rev. 4, “Core Change and Critical Fuel Loading,” RSC approval dated March 29, 2000
- Form CENTER-018, “Fuel Element Inventory Sheet,” RSC approval dated May 25, 1988
- Description of Operations Procedure Manual, Section IV, “Reactor Operations,” (undated)
- Annual Operating Report for the University of Utah TRIGA Nuclear Reactor for the period of July 1, 2005 through June 30, 2006
- Annual Operating Report for the University of Utah TRIGA Nuclear Reactor for the period of July 1, 2006 through June 30, 2007

b. Observations and Findings

The inspector determined that the licensee was maintaining the required records of the various fuel movements that had been completed and verified that the movements were conducted and recorded in compliance with 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.

Core loading procedures provided a prescribed 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. 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. Conclusions

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. Maintenance and Surveillance

a. Inspection Scope (IP 69001)

To determine that Limiting Conditions of Operation and surveillance activities were being completed as stipulated by TS Sections 3 and 4, and that maintenance was being conducted as required, the inspector reviewed:

- calibration procedures and records
- TRIGA Operations Log Nos. 36 and 37
- selected Surveillance Procedures and Logs
- Start-up and Termination Procedures and Log
- Maintenance Procedures and Maintenance Log
- selected surveillance data sheets, records, and tests
- Form CENTER-001, Rev. 10, "TRIGA Pre-start Checklist, TRIGA Start-up Checklist, and TRIGA Termination Checklist," RSC approval dated April 2, 2004
- Form CENTER-002, Rev. 3, "Biennial Control Rod Inspection/Control Rod Movement or Repair," RSC approval dated May 23, 2002
- Form CENTER-003, Rev. 6, "Semi-Annual Control Rod Calibrations," RSC approval dated March 29, 2000
- Form CENTER-008, Rev. 4, "Procedure for Adding Water to the Reactor Tank," RSC approval dated December 17, 1997
- Form CENTER-011, Rev. 2, "Calibration of Temperature Monitoring Channels," RSC approval dated March 12, 1997
- Form CENTER-012, Rev. 3, "Semi-Annual Thermal Power Calibration," RSC approval dated March 29, 2000
- Form CENTER-015, Rev. 3, "Emergency Kit Check," RSC approval dated September 17, 2003
- Form CENTER-020, Rev. 12, "Monthly Inspection Checklist," RSC approval dated April 2, 2004
- Form CENTER-022, Rev. 2, "Maintenance Log," RSC approval dated September 21, 1994
- Form CENTER-023, Rev. 4, "Annual Maintenance and Calibration of the Area Radiation Monitors (ARMs) and Continuous Air Monitor (CAM)," RSC approval dated December 17, 1997
- Description of Operations Procedure Manual, Section IV, "Reactor Operations," (undated)
- Description of Operations Procedure Manual, Section VIII, "Auxiliary Surveillance Equipment," (undated)
- Annual Operating Report for the University of Utah TRIGA Nuclear Reactor for the period of July 1, 2005 through June 30, 2006
- Annual Operating Report for the University of Utah TRIGA Nuclear Reactor for the period of July 1, 2006 through June 30, 2007

b. Observations and Findings

(1) Maintenance

A review of the reactor console log and various maintenance log forms showed that they were being maintained as required and problems, if any, were being

documented. This review also demonstrated that maintenance was being conducted consistent with the TS and applicable procedures. Maintenance activities ensured that equipment remained consistent with the Safety Analysis Report and TS requirements.

(2) Surveillance

The inspector determined that selected daily, monthly, semiannual, annual, and biennial checks, tests, and verifications for TS-required Limiting Conditions of Operation (LCOs) and surveillances were being documented in the logs and on the appropriate forms. Surveillance and LCO verifications reviewed were completed on schedule and in accordance with licensee procedures. All the recorded results reviewed by the inspector were within the TS and procedurally prescribed parameters. Several of the surveillances were being completed more frequently than required by the TS. The records and logs reviewed were complete and were being maintained as required.

c. Conclusions

Maintenance was being completed as required. The program for completing surveillance checks and LCO verifications was being carried out in accordance with TS requirements.

8. Experiments

a. Inspection Scope (IP 69001)

The inspector reviewed selected aspects of the following in order to verify that experiments were being conducted within approved guidelines:

- control of irradiated items
- potential hazards identification
- Experimental Procedures and Log
- TRIGA Operations Log Nos. 36 and 37
- selected Routine and Modified Routine Experiments
- selected Irradiation Request and Performance Forms
- selected authorized experiments documented on University of Utah TRIGA Reactor Experiment Authorization Form, RSC approval dated February 20, 1981, including Authorization Number 3-4-05, Authorization Number 4-21-05, Authorization Number 4-19-06, and Authorization Number 4-20-07
- Form CENTER-027, Rev. 4, “TRIGA Reactor Irradiation Request and Performance,” RSC approval dated March 26, 1996
- Form CENTER-028, Rev. 1, “Experimental Facility Reactivity Worth Determination,” RSC approval dated March 12, 1997
- Description of Operations Procedure Manual, Section VI, “Experiment Methods,” (undated)
- Annual Operating Report for the University of Utah TRIGA Nuclear Reactor for the period of July 1, 2005 through June 30, 2006
- Annual Operating Report for the University of Utah TRIGA Nuclear Reactor for the period of July 1, 2006 through June 30, 2007

b. Observations and Findings

The licensee classified experiments as “new”, “routine”, or “modified routine.” It was noted that, historically, routine and modified routine experiments were referred to as Class I and new experiments were referred to as Class II. New experiments were typically included any proposed activity utilizing the CENTER reactor that did not conform to an existing Experiment Authorization (EA). All new experiments were required by the TS and procedural guidance to be reviewed and approved by the RSC. Routine and modified routine experiments were those that had existing approval from the RSC and had an existing EA and TRIGA Reactor EA form. They were only required to be reviewed and approved by a Senior Reactor Operator. EAs were valid for one year (through January 1 of the next year) and were then reviewed for the upcoming year. When the inspector reviewed the EA forms for the current experiments, it was noted that they were usually not being reviewed until April. When this was brought to the attention of the Reactor Administrator, the Technical Specifications Calendar (which provided the schedule of required reviews, maintenance, surveillance, meetings, and checks) was immediately changed to reflect the need for an annual review of EAs in January of each year. This was deemed to be acceptable.

The inspector noted that no new experiments had been initiated, reviewed, or approved since the last inspection. However, licensee representatives stated that the RSC review and approval process for new experiments had been, and would continue to be, followed.

The experiments currently being conducted at the facility were those classified as routine or modified routine, Class I. Those experiments in use at the facility had been reviewed and approved by an SRO as required and were conducted under the cognizance of the RS and an SRO. The results of the experiments were documented in the TRIGA Operations Log book and on the irradiation request forms. The inspector noted that experiments were conducted in accordance within procedural and Authorization guidelines and that materials produced were controlled as required by the radiation protection program.

c. Conclusions

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

9. Emergency Preparedness

a. Inspection Scope (IP 69001)

To verify that the licensee was implementing and complying with the “University of Utah Center for Excellence in Nuclear Technology, Engineering, and Research Emergency Plan for NRC License R-126: TRIGA Nuclear Reactor,” Rev. 6, dated September 30, 2004, as approved by the NRC, the inspector reviewed selected aspects of:

- emergency drills and critiques
- coordination with offsite support groups

- training records for staff and offsite support personnel
- emergency response supplies, equipment, and instrumentation
- Emergency (Implementing) Procedures last revised December 31, 2001
- Letter of Agreement with the Gold Cross Ambulance Service dated April 8, 1993
- CENTER Annual Emergency Training Attendance Record forms for 2004 and 2005
- Emergency Call List - CENTER Emergency Call List, last revised June 10, 2004
- Form CENTER-015, Rev. 3, "Emergency Kit Check," RSC approval dated September 17, 2003
- Form CENTER-021, Rev. 24, "CENTER Emergency Call List," RSC approval dated November 29, 2006
- Form CENTER-037, "Radiological Emergency Classification Checklist," RSC approval dated December 14, 1994

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 approved by the NRC. The E-Plan was being audited and reviewed biennially as required. Implementing procedures were reviewed and revised as needed. Facilities, supplies, instrumentation and equipment were being maintained, controlled, and inventoried as required in the E-Plan. During the inspection, the contents of various emergency kits were inventoried and verified by the inspector and a licensee representative.

Through record reviews and interviews with licensee personnel, emergency responders were determined to be knowledgeable of the proper actions to take in case of an emergency. According to the licensee, agreements with outside response organizations were maintained between the various groups and the University. Communications capabilities with these support groups were acceptable and were tested periodically.

Emergency drills had been conducted annually as required. Critiques were typically held following the drills to discuss the strengths and weaknesses identified during the exercise and to develop possible solutions to any problems identified. The results of these critiques were documented and filed. Training for reactor staff and support personnel was acceptable and was conducted and documented as required.

The inspector visited the University Hospital and observed the facilities, supplies, and equipment at that support site that would be available in case of an emergency. The support that would be provided by the University Hospital in case of an accident appeared to be more than adequate. Also, there appeared to be a good working relationship between the licensee and this support organization.

c. Conclusions

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 biennially as required and were acceptable, 2) emergency response facilities and equipment were being maintained as required and responders were knowledgeable of proper actions to take in case of an

emergency, 3) offsite support was acceptable and communications capabilities were adequate, 4) annual drills were being conducted and critiques were being held as required by the Emergency Plan, and 5) emergency preparedness training for staff and offsite personnel was being completed as required.

10. Exit Interview

The inspection scope and results were summarized on July 19, 2007, with licensee representatives. The inspector 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 inspector during the inspection.

PARTIAL LIST OF PERSONS CONTACTED

Licensee Personnel

N. Brown	Graduate Research Assistant and Senior Reactor Operator
R. Brown	Dean, College of Engineering, University of Utah
D. Choe	Reactor Supervisor and Senior Reactor Operator
D. Crawford	Graduate Research Assistant and Senior Reactor Operator
M. Krahenbuhl	Reactor Administrator and Senior Reactor Operator
J. Poupard-Navarro	Graduate Research Assistant and Operator Trainee
R. Pugmire	Associate Vice President for Research, University of Utah
J. Reeves	Graduate Research Assistant and Operator Trainee
P. Tikalsky	Chair, Department of Civil and Environmental Engineering, University of Utah

Other Personnel

A. Arndt	Health Physicist, Radiological Health Department, University of Utah
J. Sanchez	Project Facilitator for the Office of Emergency Preparedness, University Hospital, University of Utah
C. Gay	Medical Doctor, University Health Care System, University of Utah
J. Hawk	Health Physicist, Radiological Health Department, University of Utah
K. Langley	Radiological Safety Officer and Director, Radiological Health Department, University of Utah

INSPECTION PROCEDURE USED

IP 69001 Class II Research and Test Reactors

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-407/2007-201-01	IFI	Follow-up on the licensee's actions to certify that one SRO had completed six hours of shift duty under the supervision of the RS before being allowed to resume routine operation of the reactor.

Closed

None

LIST OF ACRONYMS USED

CENTER	Center for Excellence in Nuclear Technology, Engineering, and Research
CFR	Code of Federal Regulations
EA	Experiment Authorization

E-Plan	Emergency Plan
IFI	Inspector Follow-up Item
IP	Inspection Procedure
LCO	Limiting Conditions of Operation
No.	Number
NRC	Nuclear Regulatory Commission
Rev.	Revision
RS	Reactor Supervisor
RSC	Reactor Safety Committee
SRO	Senior reactor operator
TS	Technical Specifications