July 10, 2013

Dr. M. Gottfredson
Executive Vice Chancellor
University of California - Irvine
Irvine, CA 92697-2025

SUBJECT: UNIVERSITY OF CALIFORNIA – IRVINE, NRC ROUTINE INSPECTION REPORT NO. 50-326/2013-201

Dear Dr. Gottfredson:

On June 10-13, 2013, the U. S. Nuclear Regulatory Commission (NRC, the Commission) conducted an inspection at the University of California - Irvine Nuclear Reactor Facility (Inspection Report No. 50-326/2013-201). The inspection included a review of activities authorized for your facility. The enclosed report presents the results of that inspection. Areas examined during the inspection are identified in the enclosed report. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations of activities in progress.

Based on the results of this inspection, no safety concern or noncompliance of requirements was 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 and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC's document system (Agencywide Document Access and Management System (ADAMS)). ADAMS is accessible from the NRC Web site at (the Public Electronic Reading Room) http://www.nrc.gov/reading-rm/adams.html.

Should you have any questions concerning this inspection, please contact Johnny Eads at 919-219-9128 or electronic mail at Johnny.eads@nrc.gov.

Sincerely,

/Patrick Isaac for RA/

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

Docket No. 50-326
License No. R-116

Enclosure:
As stated

cc: w/encl: See next page

cc:

Dr. Donald Blake, Chair
Department of Chemistry
University of California, Irvine
Irvine, CA 92697-2025

Dr. George E. Miller
Department of Chemistry
University of California, Irvine
Irvine, CA 92697-2025

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

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NAME	JEads*	GBowman (PIsaac for)
DATE	7/5/13	7/10/13

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

Docket No:	50-326
License No:	R-116
Report No:	50-326/2013-201
Licensee:	The Regents of the University of California
Facility:	University of California - Irvine Nuclear Reactor Facility
Location:	Department of Chemistry University of California, Irvine Irvine, CA
Dates:	June 10-13, 2013
Inspector:	Johnny Eads
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 California - Irvine
Nuclear Reactor Facility
NRC Inspection Report No. 50-326/2013-201

The primary focus of this routine, announced inspection was the onsite review of selected aspects of the University of California - Irvine (the licensee) Class II research reactor facility safety programs including organization and staffing; operations logs and records; requalification training; surveillance and limiting conditions for operation; emergency planning; maintenance logs and records; and fuel handling logs and records. The licensee's programs were acceptably directed toward the protection of public health and safety, and were in compliance with U. S. Nuclear Regulatory Commission (NRC) requirements.

Organization and Staffing

- The operations organizational structure and responsibilities were consistent with Technical Specification requirements.

- Shift staffing met the minimum requirements for current operations.

Operations Logs and Records

- Within the scope of this review, the licensee's operations record keeping program conformed to Technical Specification requirements.

Requalification Training

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

Surveillance and Limiting Conditions for Operation

- LCO and surveillances required by Technical Specification were being properly implemented.

Emergency Planning

- The emergency preparedness program was conducted in accordance with the Emergency Plan and implementing procedures.

Maintenance Logs and Records

- Maintenance was performed and logs and records maintained consistent with Technical Specification and licensee procedure requirements.

Fuel Handling Logs and Records

- Fuel handling and inspection activities were being completed and documented in accordance with the requirements specified in the Technical Specification and facility procedures.

REPORT DETAILS

Summary of Facility Status

The University of California - Irvine (UCI, the licensee's) Nuclear Reactor Facility (NRF) 250 kilowatt TRIGA Mark-I research reactor continued to be operated in support of graduate and undergraduate research and laboratory instruction. During the inspection, the reactor was operated in support of ongoing work and research.

1. Organizational Structure and Staffing

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

The inspectors reviewed the following regarding the licensee's organization and staffing to ensure that the requirements of Section 6.1 of Technical Specifications (TS) were being met:

- Staff qualifications
- Management responsibilities
- Staffing requirements for the safe operation of the facility
- Selected portions of the operations log for the past year through the present
- University of California, Irvine Nuclear Reactor Facility (UCI NRF) organizational structure and staffing

b. Observations and Findings

The licensee's organizational structure and staffing had not functionally changed since the last inspection. However, several key staff members had changed since the last inspection and overall the size of the reactor staff had increased. Key staff members include a new Reactor Director, Dr. Athan (A.J) Shaka, the Reactor Supervisor, Dr. George Miller, and a new Nuclear Science Assistant Engineer, Jonathan Wallick. The reactor staff consisted of five licensed Senior Reactor Operators (SRO); and six licensed Reactor Operators (RO). This overall staff size is considerably larger than during previous inspections and the new individuals added met all TS and procedural qualification requirements.

The campus health physics (HP) staff consisted of the Radiation Safety Officer (RSO), one Health Physicist, and a technician. In addition to having responsibility for the university's broad scope state byproduct license, they provided support to the reactor staff when requested and performed specific quarterly audits/inspections/surveys of the reactor. The reactor staff performed most HP functions at the reactor. Coordination of radiation protection activities between the HP staff and the reactor staff was acceptable. The reactor operations staff satisfied the training and experience requirements stipulated in the TS. The operations log and associated records confirmed that shift staffing met the minimum requirements for duty and on-call personnel.

c. Conclusion

The organizational structure and functions were consistent with TS requirements.

2. Operations Logs and Records

a. Inspection Scope (IP 69001)

The inspectors reviewed selected parts of the following reactor operations records to verify that the requirements of TS Section 6.6, Plant Operating Records, were being met:

- UCI NRF Standard Operating Procedures, Rev. 3, Approved March 2000
- Reactor Logbook #42, March 6, 2012 to September 9, 2012
- Reactor Logbook #43, September 9, 2012 to March 4, 2013
- Reactor Logbook #44, March 4, 2013 to present
- Daily Startup Checklists
- Shutdown Checklists

b. Observations and Findings

The UCI NRF procedures specified a records system that was commensurate with the size of the facility staff, and utilization factor. The Reactor Logs were detailed and operations were well documented. Procedures called for most operational data to be recorded in the reactor logbooks, startup checklists, and shutdown checklists. Data recorded indicated that the reactor was operated within the envelope of safety parameters established in the reactor license and TS.

c. Conclusion

Within the scope of this review, the licensee's operations record keeping program conformed to TS requirements.

3. Requalification Training

a. Inspection Scope (IP 69001 and 92701)

The inspectors reviewed the following to verify that the requirements of 10 CFR Section 50.55, Operators' Licenses, were being met:

- UC Irvine Nuclear Reactor Facility Operator Requalification Program, October 2010
- Requalification training records for the previous two years
- A sample of Medical Files
- Reactor Logbook #42, March 6, 2012 to September 9, 2012
- Reactor Logbook #43, September 9, 2012 to March 4, 2013
- Reactor Logbook #44, March 4, 2013 to present

b. Observations and Findings

The UCI NRF has five qualified SROs (one of these individuals was currently inactive) and six qualified ROs. The licensee is in the process of redeveloping their requalification program to better conform to the requirements of 10 CFR 55.59; specifically, with regards to biennial written exam implementation, developing a more formal, preplanned lecture series on a regular and continuing basis throughout the license period and the simulation of emergency and abnormal conditions where required actions are to be discussed.

The licensee's requalification program included the regulatory requirement 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 inspector reviewed the requalification program records and requalification plan and compared those to 10 CFR 55.59. As indicated by the records and discussions with key staff members, the program continues to meet all TS and procedural requirements. The need to rotate the position of requalification training coordinator every two years per the requalification program was discussed.

The inspectors reviewed the medical files for the NRC-licensed operators at the facility and determined that they were satisfactorily completed within the required biennial periodicity.

c. Conclusion

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

4. Surveillance and Limiting Conditions for Operation

a. Inspection Scope (IP 69001)

The inspectors reviewed the following to verify compliance with TS Section 3.0, Limiting Conditions for Operation (LCO), and to determine if the periodic surveillance tests on safety systems were performed as stipulated in TS Section 4.0, Surveillance Requirements:

- Reactor Logbook #42, March 6, 2012 to September 9, 2012
- Reactor Logbook #43, September 9, 2012 to March 4, 2013
- Reactor Logbook #44, March 4, 2013 to present
- Daily Startup Checklists
- Shutdown Checklists
- UCI NRF Standard Operating Procedures (SOP), Rev. 3, Approved March 2000

b. Observations and Findings

Surveillances were completed on schedule and in accordance with licensee procedures. The protocols and techniques were effective in verifying the performance of the safety equipment. All the recorded results were within the TS and procedurally prescribed parameters. The records and logs were complete and were being maintained as required. Checks and calibrations were completed as required by TS.

c. Conclusion

Operations were found to be in compliance with the LCO and surveillances requirements as stated in the TS.

5. Emergency Planning

a. Inspection Scope (IP 69001)

The inspectors reviewed the implementation of selected portions of the emergency preparedness program including:

- Emergency Plan for the UCINRF, Rev. 4.1 dated May 2013, submitted to the NRC on May 23, 2013
- Emergency Notification List, revised May 23, 2013
- UCI EH&S Annual Exercise: After Action Report, June 2013

b. Observations and Findings

At the UCI campus emergency management was the responsibility of the EH&S. The NRF staff worked closely with EH&S staff in matters such as emergency preparedness and exercises. The current revision of NRF's emergency plan was recently submitted to the NRC on May 23, 2013. The recent revision to the Emergency Plan was made in accordance with 10 CFR 50.54(q). The inspector verified that the changes did not decrease the effectiveness of the program and reflected the current emergency response program at the facility.

The emergency plan requires periodic drills and exercises to support training of emergency response personnel. The inspectors reviewed documentation related to annual exercises conducted July 25, 2012 and June 3, 2013, including the After Action Reports which included a critique of the drills and lessons learned. Based on a review of these records, the requirements of the emergency plan continue to be met for training of personnel and conduct of drills and exercises.

The emergency plan requires that emergency supplies be maintained in the Reactor Storeroom and that an inventory list of these supplies be maintained and verified on a routine basis. The inspector verified that the required materials and inventory were being maintained as required.

c. Conclusion

The emergency preparedness program was conducted in accordance with the Emergency Plan and implementing procedures.

6. Maintenance Logs and Records

a. Inspection Scope (IP 69001)

The inspectors reviewed the following selected maintenance logs and records to verify compliance with the requirements of TS Section 6.6.2, Principal Maintenance Activities:

- Reactor Logbook #42, March 6, 2012 to September 9, 2012
- Reactor Logbook #43, September 9, 2012 to March 4, 2013
- Reactor Logbook #44, March 4, 2013 to present

b. Observations and Findings

The inspector reviewed the maintenance records related to scheduled and unscheduled preventive and corrective maintenance activities that had occurred during the inspection period.

Routine and preventive maintenance was controlled and documented in the appropriate logs. These documents indicated that all maintenance activities were in accordance with the requirements in licensee administrative controls. The inspector verified that all maintenance was conducted in accordance with the requirements of TS, and system operational checks were performed before returning them to service.

c. Conclusion

Maintenance was performed and logs and records maintained consistent with Technical Specification and licensee procedure requirements

7. Fuel Handling Logs and Records

a. Inspection Scope (IP 69001)

To verify that TS Section 4.1 and procedural requirements were being met, the inspector reviewed selected aspects of:

- Fuel History Notebook
- Fuel handling equipment and instrumentation
- Reactor Logbook #42, March 6, 2012 to September 9, 2012
- Reactor Logbook #43, September 9, 2012 to March 4, 2013
- Reactor Logbook #44, March 4, 2013 to present
- Fuel movement and inspection records maintained on UCINRF Annual Core Examination and Fuel Element History Record forms

- UCINRF SOP Chapter 4, “Normal Operating Procedures,” Section 4.8, “Fuel Element and Control Rod Removal and Measurement,” Revision 3.1, approved January 21, 2005
- UCINRF SOP Chapter 4, “Normal Operating Procedures,” Section 4.10, “Fuel Inventory,” Revision 3.1, approved January 21, 2005

b. Observations and Findings

Procedures for refueling, fuel movement, and TS required fuel inspections and/or surveillances had been reviewed and approved as required and were available to ensure controlled operations. Fuel movement, log keeping, and data recording were being completed as directed by the procedures.

c. Conclusions

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

8. Exit Interview

The inspection scope and results were summarized on June 13, 2013, with members of licensee management. The inspectors described the areas inspected and discussed in detail the inspection findings. No dissenting comments were received from the licensee. The licensee acknowledged the findings presented 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

G. Miller	Reactor Supervisor
A.J. Shaka	Reactor Director
J. Wallick	Nuclear Science Assistant Engineer

Other Personnel

L. Bogue	Emergency Services Manager, UCI Police Department

INSPECTION PROCEDURES USED

IP 69001	Class II Research and Test Reactors

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

None

PARTIAL LIST OF ACRONYMS USED

ALARA	As Low As Reasonably Achievable
10 CFR	Title 10 of the *Code of Federal Regulations*
EH&S	Office of Environmental Health and Safety
EP	Emergency Plan
IFI	Inspector Follow-up Item
IP	Inspection Procedure
LCO	Limiting Conditions for Operation
NAA	Neutron Activation Analysis
NRC	U. S. Nuclear Regulatory Commission
NRF	Nuclear Reactor Facility
PARS	Publicly Available Records
SOP	Standard Operating Procedure
SRO	Senior Reactor Operator
TS	Technical Specifications
UCI	University of California - Irvine
URI	Unresolved Item