



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

February 3, 2022

Dr. Hal Stern, Provost
and Executive Vice Chancellor
University of California, Irvine
509 Aldrich Hall
Irvine, CA 92697-2025

SUBJECT: BOARD OF REGENTS OF THE UNIVERSITY OF CALIFORNIA – U.S. NUCLEAR
REGULATORY COMMISSION ROUTINE SAFETY INSPECTION REPORT
NO. 05000326/2021201

Dear Dr. Stern:

From December 6-9, 2021, the U.S. Nuclear Regulatory Commission (NRC) staff conducted an inspection at the University of California - Irvine Nuclear Reactor Facility. The enclosed report presents the results of this inspection that were discussed on December 9, 2021, 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 inspector reviewed selected procedures and records, observed various activities, and interviewed personnel. Based on the results of this inspection, no findings of significance were identified. No response to this letter is required.

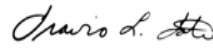
In accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public inspections, exemptions, requests for withholding," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of 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).

H. Stern

- 2 -

Should you have any questions concerning this inspection, please contact Mr. Kevin Roche at (301) 415-1554, or by electronic mail at Kevin.Roche@nrc.gov.

Sincerely,



Signed by Tate, Travis
on 02/03/22

Travis L. Tate, Chief
Non-Power Production and Utilization Facility
Oversight Branch
Division of Advanced Reactors and Non-Power
Production and Utilization Facilities
Office of Nuclear Reactor Regulation

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

Enclosure:
As stated

cc: See next page

University of California at Irvine

Docket No. 50-326

cc:

Dr. Douglas Tobias, Chair
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University of California, Irvine
Irvine, CA 92697-2025

Radiologic Health Branch
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Dr. George Miller, Reactor Supervisor
Nuclear Reactor Facility
Department of Chemistry
University of California, Irvine
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Irvine, CA 92697-2025

Dr. A.J. Shaka, Reactor Director
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University of California, Irvine
231A Rowland Hall
Irvine, CA 92697-2025

Test, Research and Training
Reactor Newsletter
Attention: Ms. Amber Johnson
Dept of Materials Science and Engineering
University of Maryland
4418 Stadium Drive
College Park, MD 20742-2115

Dr. Howard Gillman, Chancellor
University of California, Irvine
510 Aldrich Hall
Irvine, CA 92697

SUBJECT: BOARD OF REGENTS OF THE UNIVERSITY OF CALIFORNIA – U.S. NUCLEAR REGULATORY COMMISSION ROUTINE SAFETY INSPECTION REPORT
NO. 05000326/2021201 DATED: FEBRUARY 3, 2022

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

Docket No.: 50-326

License No.: R-116

Report No.: 05000326/2021201

Licensee: Board of Regents of the University of California

Facility: University of California, Irvine Nuclear Reactor Facility

Location: Department of Chemistry

Dates: December 6-9, 2021

Inspector: Kevin M. Roche

Approved by: Travis L. Tate, Chief
Non-Power Production and Utilization Facility
Oversight Branch
Division of Advanced Reactors and Non-Power
Production and Utilization Facilities
Office of Nuclear Reactor Regulation

Enclosure

EXECUTIVE SUMMARY

University of California, Irvine
Nuclear Reactor Facility
Inspection Report No. 05000326/2020201

The primary focus of this routine, announced inspection was the onsite review of selected aspects of the University of California - Irvine (UCI, the licensee) Class II research reactor facility safety programs including: (1) organization and staffing; (2) operations logs and records; (3) requalification training; (4) surveillance and limiting conditions for operation (LCO); (5) emergency planning; (6) maintenance logs and records and (7) fuel handling logs and records. The U.S. Nuclear Regulatory Commission (NRC) staff determined that the licensee's programs were acceptably directed toward the protection of public health and safety, and in compliance with NRC requirements.

Organization and Staffing

- Facility organization and staffing followed the requirements specified in technical specification (TS) 6.1.

Operation Logs and Records

- The operation logs and records were maintained in accordance with facility procedures and TSs.

Requalification and Training

- The requalification program was conducted consistently with the TSs, licensee procedures, and regulations.

Surveillance and Limiting Conditions for Operation

- Operations followed the LCO and surveillance requirements as required in the TSs.

Emergency Planning

- The Emergency Plan (E-Plan), oversight, drills, and training were implemented as required by facility procedures and regulations.

Maintenance Logs and Records

- The licensee maintained records documenting principal maintenance activities in compliance with TS requirements and facility procedures.

Fuel Handling Logs and Records

- The licensee conducted and documented fuel handling activities in accordance with TS requirements and facility procedures.

REPORT DETAILS

Summary of Facility Status

The UCI Nuclear Reactor Facility (NRF) 250 kilowatt TRIGA Mark-I research reactor continued to operate in support of graduate and undergraduate research and laboratory instruction. During the inspection, the reactor was not operated.

1. Organization and Staffing

a. Inspection Scope (Inspection Procedure (IP) 69001-02.01)

To ensure that the requirements of TS 6.1 were met, the inspector reviewed the following:

- Facility Operating License No. R-116, Docket No. 50-326, Amendment No. 7
- Appendix A to Facility Operating License No. R-116, Amendment No. 7
- reactor console logs documenting operation from December 2019 through the present
- the UCI NRF annual report, submitted July 30, 2020
- the UCI NRF annual report, submitted July 28, 2021

b. Observations and Findings

The inspector found that since the previous NRC inspection (Inspection Report No. 50-326/2019-201), there were personnel changes in the organization at the NRF. The licensee selected Dr. A.J. Shaka as the new Reactor Director (Level 2). The inspector confirmed that Dr. Shaka met the responsibilities specified in TS 6.1.2 and the guidance in the "American National Standards Institute/American National Standards-15.4-2007," as required by TS 6.1.4. The inspector also noted the UCI hired a new Radiation Safety Officer, Aldrich Rivera.

The inspector verified that a list of facility personnel is posted in the control room in accordance with TS 6.1.3. The inspector found the list to contain the names and contact information for management, radiation safety, and other support personnel. The inspector verified the current management and operational personnel are listed. Further, the inspector confirmed the accuracy of the contact information for offsite support organizations.

At the time of the inspection, the inspector confirmed four operators held senior reactor operator (SRO) licenses, but one is inactive and four held reactor operator (RO) licenses at the facility, but one was inactive. The inspector verified that those inactive operators have not operated since not fulfilling the requirements of the requalification plan.

The inspector reviewed NRF logbook entries and determined that staffing satisfied the requirements of TS 6.1.3.

c. Conclusion

The inspector determined the UCI NRF organization and staffing were consistent with the requirements in TS 6.1.

2. Operations Logs and Records

a. Inspection Scope (IP 69001-02.02)

To ensure that the requirements of TS 6.7 were met, the inspector reviewed the following:

- the UCI NRF annual report, submitted July 30, 2020
- the UCI NRF annual report, submitted July 28, 2021
- UCI NRF standard operating procedures (SOPs), Revision 3.3, dated September 1, 2020
- selected logs from November 2019 to present
- request for operations
- daily startup checklists November 2019 to present
- shutdown checklists November 2019 to present

b. Observations and Findings

The inspector observed that logbook entries were maintained in accordance with approved procedures. The inspector determined that logs and records are maintained as required by the licensee's administrative procedures. The inspector verified that records also showed that operational conditions and parameters were consistent with the license and TS requirements.

c. Conclusion

The inspector determined the licensee's logbook records and record keeping programs were maintained as required by licensee administrative procedures and met the retention requirements of the TSs.

3. Qualification Training

a. Inspection Scope (IP 69001-02.04)

To ensure that the qualification training requirements of TSs 6.1.4, and 6.8.2, and, Title 10 of the *Code of Federal Regulations* (10 CFR) 55.53, "Conditions of licenses," paragraphs (e) and (h), were met, the inspector reviewed the following:

- active license status of all current ROs and SROs
- medical examination records for selected operators
- UCI NRF operator qualification program, October 2010
- written examinations given during March 2021
- logs and records of reactivity manipulations for the qualification cycle (November 2019 through present)

b. Observations and Findings

The inspector found that the requalification plan contains annual on-the-job training, oral test, and operational test requirements. The inspector verified that training requirements in the areas required were performed throughout the training cycle. The inspector found that written, operations, and emergency preparedness exams were completed during the training cycle, as required by the requalification plan. The inspector verified, based on a sample of records, that licensed operators performed the required quarterly hours of reactor operations. Further, the inspector confirmed by record review that all active operators completed a biennial medical examination.

c. Conclusion

The inspector determined that the UCI NRF requalification program was conducted as required by NRC regulations, UCI NRF TSs, and procedures

4. Surveillance and Limiting Conditions for Operation

a. Inspection Scope (IP 69001-02.05)

To ensure that the requirements of TS 3.0, and TS 4.0 were met, the inspector reviewed the following:

- Appendix A to Facility Operating License No. R-116, Amendment No. 7
- daily startup checklist from November 2019 until present
- shutdown checklist from November 2019 until present
- UCI NRF SOP, 4.3, "Reactor Power Calibration," approved 2000.
- SOP 4.3, "Reactor Power Calibration," dated September 1, 2020
- completed power calibration data from January 21, 2020, and January 28, 2021
- SOP 4.4.1, "Drop Time Test," dated September 1, 2020
- completed drop time test data from January 8, 2020, and February 2, 2021

b. Observations and Findings

The inspector selected a sample of the TS-required surveillances to verify implementation and determined that the surveillance frequency and outcome met TS requirements. The inspector verified surveillance results were retained as required by TS 6.8.1 and licensee's procedural requirements.

c. Conclusion

The inspector determined that UCI NRF operations followed the LCOs and surveillance requirements as stated in the TSs.

5. Emergency Planning

a. Inspection Scope (IP 69001-02.10)

To verify compliance with the UCI NRF E-Plan, the inspector reviewed selected aspects of the following:

- E-Plan for the UCI NRF, Revision 4.3
- training records for the past 2 years
- emergency response facilities, supplies, equipment, and instrumentation
- after action report for UCI Zot Thunder on January 15, 2020, tabletop exercise
- after action report for radiation safety exercise on February 17, 2021, functional exercise

b. Observations and Findings

The inspector verified that the E-Plan in use at the reactor and emergency facilities was the same as the version most recently submitted to the NRC for approval. The inspector verified that the E-Plan and implementing procedures were reviewed annually as required by the E-Plan. The inspector verified that emergency response facilities, supplies, instrumentation, and equipment were maintained and controlled as required in the E-Plan.

Through records review and interviews with licensee personnel, the inspector determined that emergency responders were knowledgeable of the proper actions to take in case of an emergency. The inspector found that letters of agreement with outside response organizations were maintained and updated annually.

Through drill record review, the inspector determined that emergency drills were conducted annually as required by the E-Plan. The inspector determined that critiques were held following the drills to discuss the strengths and weaknesses identified during the exercises and to develop possible solutions to any problems identified. The results of these critiques were documented. The inspector found that emergency preparedness and response training for reactor staff personnel was conducted and documented as stipulated in the E-Plan.

c. Conclusion

Based upon the review of emergency response documents, facility walkdowns, and interviews of licensee personnel, the inspector concluded that the licensee met the requirements of the approved UCI NRF E-Plan.

6. Maintenance Logs and Records

a. Inspection Scope (IP 69001-02.11)

To ensure that the maintenance requirements of TSs 6.7.1.c. and 6.8.1 were met, the inspector reviewed the following:

- Appendix A to Facility Operating License No. R-116, Amendment No. 7
- weekly surveillance checks sheets for June 2019-present

- the UCI NRF annual report, submitted July 30, 2020
- the UCI NRF annual report, submitted July 28, 2021
- a selection of maintenance logs and console logbooks

b. Observations and Findings

. The inspector determined that the selected significant maintenance items reviewed were documented and resolved as required by the licensee's administrative procedures. Additionally, the inspector verified by document review that maintenance records were retained for at least 5 years as required by TS 6.8.1.

c. Conclusion

The inspector determined the licensee maintained records documenting maintenance activities in compliance with TS requirements and UCI NRF procedures.

7. Fuel Handling Logs and Records

a. Inspection Scope (IP 69001-02.12)

To ensure that the requirements of TSs 3.1.4 and 4.1.c were met, the inspector reviewed the following:

- UCI core status board
- reactor console logs documenting operation from December 2019 to the present
- fuel movement and surveillance records

b. Observations and Findings

The inspector determined that no fuel inspections have occurred since this module was previously inspected and none were required by TS. The inspector confirmed that the licensee had not performed any fuel movement since the last inspection

c. Conclusion

The inspector determined that the licensee conducted and documented fuel handling activities in accordance with TS requirements and licensee procedures.

8. Exit Interview

The inspector reviewed the inspection results with members of licensee management at the conclusion of the inspection on December 9, 2021. The licensee acknowledged the results and conclusions presented by the inspector.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

G. Miller	Reactor Supervisor
J. Keffer	Reactor Facility Manager
T. Babikian	Senior Reactor Operator

INSPECTION PROCEDURES USED

IP 69001	Class II Research and Test Reactors
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ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

None

Discussed

None