



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

March 22, 2024

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 SAFETY INSPECTION REPORT  
NO. 05000326/2024201

Dear Dr. Stern:

From February 5-8, 2024, the U.S. Nuclear Regulatory Commission (NRC) staff conducted an inspection at the University of California, Irvine Nuclear Reactor Facility. The enclosed report documents the inspection results, which were discussed on February 8, 2024, 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.

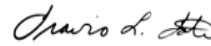
In accordance with Title 10 of the *Code of Federal Regulations* Section 2.390, "Public inspections, exemptions, requests for withholding," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of the NRC's document system (Agencywide Documents Access and Management System (ADAMS)). ADAMS is accessible from the NRC website at <https://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

H. Stern

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If you have any questions concerning this inspection, please contact Juan Arellano at (301) 415-0477, or by email to [Juan.Arellano@nrc.gov](mailto:Juan.Arellano@nrc.gov).

Sincerely,



Signed by Tate, Travis  
on 03/22/24

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 w/enclosure: GovDelivery Subscribers

SUBJECT: BOARD OF REGENTS OF THE UNIVERSITY OF CALIFORNIA – U.S. NUCLEAR REGULATORY COMMISSION SAFETY INSPECTION REPORT  
NO. 05000326/2024201 DATED: MARCH 22, 2024

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<b>NAME</b>	JArellano	NParker	TTate
<b>DATE</b>	02/26/2024	02/27/2024	03/22/2024

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

Docket No.: 50-326

License No.: R-116

Report No.: 05000326/2024201

Licensee: Board of Regents of the University of California

Facility: University of California, Irvine Nuclear Reactor Facility

Location: Irvine, CA

Dates: February 5 - 8, 2024

Inspector: Juan Arellano

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. 05000326/2024201

The primary focus of this routine announced inspection was the onsite review of selected aspects of the University of California – Irvine, Nuclear Reactor Facility (UCINRF, the licensee) Class II research reactor facility program, 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 program was acceptably directed toward the protection of public health and safety, and in compliance with NRC requirements.

### Organization and Staffing

- The inspector determined that the organization and staffing were in compliance with the technical specification (TS) requirements.

### Operations Logs and Records

- The inspector determined that the operations logs and records were maintained in accordance with the applicable TS and the licensee's procedural requirements.

### Requalification Training

- The inspector determined that the operator requalification program was conducted and completed in accordance with the NRC-approved program and regulatory requirements.

### Surveillance and Limiting Conditions for Operation

- The inspector determined that surveillances were conducted and LCO were maintained in accordance with TS requirements.

### Emergency Planning

- The inspector determined that the emergency preparedness program was conducted in accordance with the emergency plan.

### Maintenance Logs and Records

- The inspector determined that the maintenance activities were performed and documented in accordance with TS requirements.

### Fuel Handling Logs and Records

- The inspector determined that the fuel movements and inspections were conducted in accordance with TS and the licensee's procedural requirements.

## REPORT DETAILS

### Summary of Facility Status

The UCINRF 250 kilowatt TRIGA Mark-I research reactor is operated in support of education, research, reactor operator training, and periodic equipment surveillances. During the inspection, the reactor was not operated.

### 1. Organization and Staffing

#### a. Inspection Scope (Inspection Procedure (IP) 69001, Section 02.01)

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

- "UNIVERSITY OF CALIFORNIA IRVINE NUCLEAR REACTOR FACILITY ANNUAL REPORT 2021-2022"
- "UNIVERSITY OF CALIFORNIA IRVINE NUCLEAR REACTOR FACILITY ANNUAL OPERATING REPORT (AOR) 2022-2023"
- reactor logbook 57
- reactor logbook 58
- reactor logbook 59
- reactor logbook 60
- reactor logbook 61
- "University of California - Irvine, Docket Number 50-326, License Number R-116, Notification of Personnel Change and Request for Approval of Reviewing Official," dated July 15, 2022
- "New Chair for the Chemistry Department," dated April 24, 2023
- "University of California – Irvine, Docket Number 50-326, License Number R-116, Personnel Changes," dated February 5, 2024

#### b. Observations and Findings

The inspector found that since the previous NRC inspection (Inspection Report No. 05000326/2021201), there were personnel changes made to the organization as outlined by TS 6.1.1. The licensee selected a new Chair for the Chemistry Department (Level 1) and a new Reactor Supervisor (Level 3). The inspector confirmed that the individuals met the responsibilities specified in TS 6.1.2. The inspector observed that a list of facility personnel was posted in the control room in accordance with TS 6.1.3 (b). The inspector found that the list contained the current names and contact information for management, operations, radiation safety, and other support personnel. The inspector determined that staffing satisfied the requirements of TS 6.1.3 (a).

#### c. Conclusion

The inspector determined that the licensee's organization and staffing were in compliance with the requirements specified in the TSs.

## 2. Operations Logs and Records

### a. Inspection Scope (IP 69001, Section 02.02)

To ensure that the requirements of TS 6.8 were met, the inspector reviewed the following:

- reactor logbook 57
- reactor logbook 58
- reactor logbook 59
- reactor logbook 60
- reactor logbook 61
- "UNIVERSITY OF CALIFORNIA IRVINE NUCLEAR REACTOR FACILITY ANNUAL REPORT 2021-2022"
- "UNIVERSITY OF CALIFORNIA IRVINE NUCLEAR REACTOR FACILITY ANNUAL OPERATING REPORT (AOR) 2022-2023"
- "UC Irvine Nuclear Reactor Facility Instruction Manual," revision 0
- select, "Start-Up Checklist," performed 2022 - present
- select, "Shutdown Checklist," performed 2022 - present
- "2018 - 2022 UCI Reactor - Pulse Data"
- UCINRF safety analysis report revision 1 dated October 1999

### b. Observations and Findings

The inspector found that logbook entries were maintained in accordance with approved procedures. The inspector found that TS items were entered in the console logbook, including the names of licensed operators during reactor operations, location of fuel during movement, changes in reactor power and operations, and maintenance items as required by procedures.

### c. Conclusion

The inspector determined that the licensee's logbook entries and records were maintained as required by facility procedures and TSs.

## 3. Requalification Training

### a. Inspection Scope (IP 69001, Section 02.04)

To ensure the requirements of the requalification program were met, the inspector reviewed the following selected aspects of the UCINRF requalification program:

- "U.C. IRVINE NUCLEAR REACTOR FACILITY DOCKET 50-326 OPERATOR REQUALIFICATION PROGRAM," revised October 2010
- active license status for all ROs and SROs
- reactor logbook 58
- reactor logbook 59
- reactor logbook 60
- reactor logbook 61
- "UCI NRF Licensed Operator Hours Summary"

- select written examination records performed 2021 - present
- select reactor operations practical examinations performed 2021 - present
- medical examination records for select operators

b. Observations and Findings

The inspector noted that there were ten NRC licensed operators at the UCIRNF consisting of three senior reactor operators (SROs), six reactor operators (ROs), and one inactive operator. The inspector found that training was conducted in accordance with the licensee's NRC-approved requalification and training program and was documented. The inspector confirmed that the licensed operators completed all the reactor operations and examinations required by the program, with the exception of one inactive operator, and requalification records were maintained as required by TS 6.8.2. The inspector found that operator medical examinations were completed every 2 years as required by the regulations.

c. Conclusion

The inspector determined that the operator requalification program was conducted and completed in accordance with the NRC-approved program and that the medical evaluations were completed in accordance with regulatory requirements.

#### 4. Surveillance and Limiting Conditions for Operation

a. Inspection Scope (IP 69001, Section 02.05)

The inspector reviewed the following to verify compliance with TS 3, and to determine if surveillance tests were performed as required by TS 4:

- select "Ventilation Operability Checklist," performed 2022 - present
- "REG Rod Curve 01/26/2024"
- "SHIM Rod Curve 01/26/2024"
- "ATR Rod Curve 01/26/2024"
- standard operating procedures, (SOP) 4.3, "Reactor Power Calibration," revision 3.3, approved 2020
- SOP 4.4, "Reactor Control Rods and Drives Surveillance," revision 3.3, approved 2020
- reactor logbook 57
- reactor logbook 59
- reactor logbook 61
- power calibration sheet dated January 31, 2024
- power calibration sheet dated February 9, 2023
- SOP 4.7.2.3, "Pool Water Level Channel," revision 3.3 approved 2020
- SOP 4.7.2.4, "Pool Water Temperature Channel," revision 3.3 approved 2020
- SOP 4.7.2.5, "Fuel Temperature Channel," revision 3.3 approved 2020
- pool water level monitor channel manuals binder
- pool water temperature channel binder
- fuel thermocouple modules binder
- "Water Level Calibration Form," performed 2022 - present
- "Water Temperature Calibration Form," performed 2022 - present



- “Fuel Temperature Calibration Form,” performed 2022 - present
- quarterly and monthly surveillance binder
- UCINRF safety analysis report revision 1 dated October 1999

b. Observations and Findings

The inspector found that surveillance tests were completed as required by the TSs and LCO verifications were completed on schedule and in accordance with the licensee’s procedures. The inspector observed a senior licensed operator perform a ventilation operability checklist required by TS 4.5 to meet TS 3.5.1 and TS 3.5.2. The inspector also observed the pool conductivity measuring apparatus to ensure it met TS 3.3.3.

c. Conclusion

The inspector determined that the surveillances were conducted and LCO were maintained in accordance with TS requirements.

**5. Emergency Planning**

a. Inspection Scope (IP 69001, Section 02.10)

The inspector reviewed the following selected portions of the licensee’s emergency preparedness program to verify compliance with Appendix E, “Emergency Planning and Preparedness for Production and Utilization Facilities,” to Title 10 of the *Code of Federal Regulations*, Part 50, “Domestic Licensing of Production and Utilization Facilities,” and the licensee’s emergency plan:

- “UC Irvine Nuclear Reactor Facility Emergency Plan,” revision 4.3 dated November 19, 2021
- reactor logbook 59
- SOP 4.10.2, “Retrieval of Objects from Reactor Pool,” revision 3.3 approved 2020
- emergency procedures (EP) 3B, “Contaminated Injured Person,” revision 3.3a approved November 2021
- EP 3B checklist revision 3.3a approved November 2021
- reactor emergency exercise dated March 23, 2022
- “UCI Nuclear Reactor Exercise March 23, 2022 After Action Report”
- reactor emergency exercise dated June 14, 2023
- “Nuclear Reactor Tabletop Exercise June 14, 2023,” PowerPoint
- “Nuclear Reactor Exercise After-Action Report” dated June 14, 2023
- “Emergency Call List UCI Nuclear Reactor Facility,” dated December 21, 2023
- EP 7, “Radioactive Spill,” revision 3.3a approved November 2021
- EP 7 checklist revision 3.3a approved November 2021
- EP 8A, “Procedure for Earthquake Response,” revision 3.3a approved November 2021
- EP 8A checklist revision 3.3a approved November 2021

b. Observations and Findings

The inspector found that the emergency plan training was conducted, drills were performed, and emergency response call lists were maintained and posted as required by the emergency plan and licensee procedures. The inspector toured the facility and verified the emergency supply closet and emergency locker was maintained as required by the emergency plan. The inspector also verified the decontamination showers were maintained as required by the emergency plan. The inspector observed the annual facility emergency exercise initial planning meeting on February 7, 2024, as required by the emergency plan. The inspector verified the operability of the small air pump and filter unit in the control room as required by the emergency plan.

c. Conclusion

The inspector determined that the emergency preparedness program was conducted in accordance with the emergency plan.

**6. Maintenance Logs and Records**

a. Inspection Scope (IP 69001, Section 02.11)

The inspector reviewed the following selected maintenance logs and records to verify compliance with the requirements of TSs:

- "UNIVERSITY OF CALIFORNIA IRVINE NUCLEAR REACTOR FACILITY ANNUAL REPORT 2021-2022"
- "UNIVERSITY OF CALIFORNIA IRVINE NUCLEAR REACTOR FACILITY ANNUAL OPERATING REPORT (AOR) 2022-2023"
- maintenance procedure 1, "CAM Annual Maintenance"
- maintenance instructions 1, "CAM Mechanical Clean and Inspect"
- reactor logbook 58
- reactor logbook 59
- "Water Particulate Filter Cartridge Change"
- "PT Blower Maintenance"

b. Observations and Findings

The inspector found that the scheduled and unscheduled preventive and corrective maintenance activities were performed and documented in accordance with TS requirements and the licensee's administrative procedures.

c. Conclusion

The inspector determined that the maintenance activities were performed and documented in accordance with TS requirements.

## 7. Fuel Handling Logs and Records

### a. Inspection Scope (IP 69001, Section 02.12)

The inspector reviewed the following fuel handling logs and activities to verify compliance with TS requirements:

- core status board
- reactor logbook 53
- reactor logbook 61
- select “U.C. Irvine Nuclear Reactor Annual Core Examination and Fuel Element History Record,” sheets performed 2018 - present
- change documentation form 2023-04 dated December 11, 2023

### b. Observations and Findings

The inspector found that the fuel handling activities were conducted and documented in accordance with TS requirements and the licensee’s procedural requirements. The inspector found that since the last fuel inspection in 2018, fuel movement did not take place until the 2023 fuel inspection as required by TS 4.1 (d). The inspector observed that the fresh fuel elements in storage and the irradiated fuel elements in storage racks aligned with the location of fuel elements documented in the logbooks, reactor bay core map, and fuel binder.

### c. Conclusion

The inspector determined that the fuel movements and inspections were conducted in accordance with TS and the licensee’s procedural requirements.

## 8. Exit Interview

The inspection scope and results were summarized on February 8, 2024, with members of licensee management and staff. The inspector described the areas inspected and discussed the inspection results.

**PARTIAL LIST OF PERSONS CONTACTED**

Licensee Personnel

A.J. Shaka	Reactor Director
J. Keffer	Reactor Supervisor
G. Miller	Reactor Supervisor Emeritus

**INSPECTION PROCEDURES USED**

IP 69001	Class II Non-Power Reactors
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**ITEMS OPENED, CLOSED, AND DISCUSSED**

Opened

None

Closed

None

Discussed

None