May 8, 2001

Dr. S. Golub
Executive Vice Chancellor,
University of California, Irvine
Irvine, CA 92697-2025

SUBJECT: NRC INSPECTION REPORT NO. 50-326/2001-201 AND NOTICE OF VIOLATION

Dear Dr. Golub

This letter refers to the inspection conducted on February 27 to March 2, 2001, at your University of California - Irvine (UCI) TRIGA reactor. The enclosed report presents the results of that inspection.

Various aspects of your reactor operations and security programs were inspected, including selective examinations of procedures and representative records, interviews with personnel, and observations of the facility.

Based on the results of this inspection, the Nuclear Regulatory Commission (NRC) has identified one violation of NRC requirements. The violation is cited in the enclosed Notice of Violation (Notice). The circumstances surrounding it are described in detail in the subject inspection report. The violation is of concern because it demonstrates a lack of support to ensure all required Technical Specification requirements are completed.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. The NRC will use your response in accordance with its policies to determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be placed in the NRC Public Document Room on the ADAMS System. Your cooperation is appreciated. Should you have any questions concerning this inspection, please contact Mr. Stephen Holmes at 301-415-8583.

Sincerely,
/RA/

Ledyard B. Marsh, Chief
Events Assessment, Generic Communications
and Non-Power Reactors Branch
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket No. 50-326
License No. R-116
Enclosure: NRC Inspection Report No. 50-326/2000-201
Notice of Violation

cc w/enclosures: Please see next page

cc:

Dr. Richard Chamberlain, Chair
Department of Chemistry
University of California, Irvine
Irvine, CA 92697-2025

Mr. Steve Hsu
Radiological Health Branch
State Department of Health Services
P.O. Box 9442732
Sacramento, CA 94234-7320

Dr. George E. Miller
Department of Chemistry
516 Physical Sciences 1
University of California, Irvine
Irvine, CA 92697-2025

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

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NOTICE OF VIOLATION

University of California - Irvine — Docket No. 50-326
University of California TRIGA Reactor — License No. R-116

During an NRC inspection conducted on February 27 to March 2, 2001, one violation of NRC requirements was identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," NUREG-1600, the violation is listed below:

As identified by the inspector during this inspection, Section 4.4 Pool Water Level Channel of the UCI Technical Specifications states that: " The pool water level measuring channel shall be verified to be operable at intervals not to exceed two months."

Contrary to the above, from October 9, 2000 to January 11, 2001, (a period exceeding two months) the pool water level measuring channel was not verified to be operable. This is a Severity Level IV violation (Supplement I).

Pursuant to the provisions of 10 CFR 2.201, the University of California - Irvine is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555 with a copy to the cognizant inspector, within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation" and should include for each violation: (1) the reason for the violation, or, if contested, the basis for disputing the violation or severity level, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken to avoid further violations, and (4) the date when full compliance will be achieved. Your response may reference or include previous docketed correspondence, if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, an order or a Demand for Information may be issued as to why the license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time.

If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, D.C. 20555-0001.

Because your response will be placed in the NRC Public Document Room (PDR), to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be placed in the PDR without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by

10 CFR 2.790(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days.

Dated this 8th day of May 2001.

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

Docket No:	50-326
License No:	R-116
Report No:	50-326/2001-201
Licensee:	University of California, Irvine
Facility:	University of California TRIGA Reactor
Location:	Department of Chemistry University of California, Irvine Irvine, CA 92697-2025
Dates:	February 27 to March 2, 2001
Inspector:	Stephen W. Holmes, Reactor Inspector
Approved by:	Ledyard B. Marsh, Chief Events Assessment, Generic Communications and Non-Power Reactors Branch Division of Regulatory Improvement Programs Office of Nuclear Reactor Regulation

EXECUTIVE SUMMARY

This routine, announced inspection included onsite review of selected aspects and activities since the last NRC inspection of the following: Organizational Structure and Functions, Experiments, Review and Audit, Operations, Fuel Handling, Operator Requalification, Surveillance, Maintenance, Design Control, Procedures, and Security.

ORGANIZATIONAL STRUCTURE AND FUNCTIONS

The operations organizational structure and functions were consistent with Technical Specifications (TS) requirements for current shift operations.

EXPERIMENTS

Licensee control and performance of experiments met TS and regulatory requirements.

REVIEW AND AUDIT

The review and audit program satisfied TS requirements.

OPERATIONS

Operational activities were consistent with applicable requirements.

FUEL HANDLING

Fuel handling activities and documentation were as required by TS and facility procedures.

OPERATOR REQUALIFICATION

The Requalification program was being acceptably implemented. TS and NRC-approved Requalification plan requirements were met.

SURVEILLANCE

The licensee's program for surveillance and limiting conditions for operation (LCO) confirmations satisfied TS requirements. One level IV Violation of TS surveillances requirements was identified.

MAINTENANCE

Maintenance logs, records, performance, and reviews satisfied TS and procedure requirements. Facility condition was well maintained for its intended function and use.

DESIGN CONTROL

The licensee's design change procedures were in place and were implemented as required.

PROCEDURES

Facility procedures and use satisfied TS requirements. The procedural control and implementation program satisfied TS requirements. Some mismatches were identified between the licensee's written procedures and survey performance. This is an inspector follow-up item.

SECURITY

Security facilities, equipment, and procedures satisfied the Physical Protection Plan (PPP) requirements.

REPORT DETAILS

Summary of Plant Status

During the inspection the reactor was operated several days a week to support education, operator training, surveillance, and experiments.

1. ORGANIZATIONAL STRUCTURE AND FUNCTION

a. Inspection Scope (Inspection Procedure 69001)

The inspector reviewed selected aspects of:

- operations organization and staffing
- qualifications
- management responsibilities
- administrative controls

b. Observations and Findings

The operations organizational structure had not functionally changed since the last inspection. The reactor staff consisted of one permanent half time staff (the reactor supervisor (RS)), one licenced Senior Reactor Operator (providing only reactor operations time) and, since December 1995, a series of quarter time temporary students direct support staff. Historically support staffing had consisted of a full-time RS, a second operator, and permanent HP assigned half time to the reactor. With teaching and research duties, and facility relicensing, the time dedicated to reactor operation and maintenance was limited.

The reactor staff satisfied the training and experience required by the TS. Operation logs and records confirmed that shift staffing met the minimum requirements for duty and on-call personnel. Review of records verified that management responsibilities were administered as required by TS and applicable procedures.

Although the licenced reactor staff meet TS, the inspector identified a concern in this area to the Dean and Associate Dean of Physical Sciences, the RS, and the RSO. This concern stems from the number and type of Inspector Follow-up Items, Unresolved Items, Non-Cited Violations and the Notices of Violations issued in the previous three inspection reports, and the Notice of Violation from this inspection. Staffing appears to be a key factor to the identified items and violations.

Additionally, the second SRO professor is retiring this summer, leaving the RS as the only licensed operator for the facility. Although the operation of the reactor with a single SRO is the normal mode authorized by TS, having only one person available to run the reactor will concentrate the workload on that single individual, and leave the facility vulnerable to a loss of licensed staff due to a single individual's illness, incapacity, or loss. Therefore, an assessment of staffing levels may be necessary.

It was noted that the SRO need only meet the NRC requirements for obtaining and maintaining a license and need not be a permanent, full-time, or university staff.

c. Conclusions

The operations organizational structure and functions were consistent with TS requirements for current shift operations.

2. EXPERIMENTS

a. Inspection Scope (Inspection Procedure 69001)

The inspector reviewed selected aspects of:

- experimental program requirements
- procedures
- logs and records
- approved reactor experiments
- ROC minutes
- experimental administrative controls and precautions

b. Observations and Findings

Experiments and changes to approved experiments had been reviewed and approved by the ROC as required by TS.

Review of the experiment procedures and reactor log books, interviews with staff, and observation verified that experiments were constrained as required by the TS and experiment authorization. Experiments were also installed, performed, and removed as outlined in the experiment authorization and procedures.

c. Conclusions

Control and performance of experiments met TS and applicable requirements.

3. REVIEW AND AUDIT

a. Inspection Scope (Inspection Procedure 69001)

The inspector reviewed selected aspects of:

- ROC minutes
- safety review records
- audit records
- responses to safety reviews and audits
- review and audit personnel qualifications

b. Observations and Findings

The ROC membership satisfied TS requirements and the Committee's procedural rules. Review of the minutes indicated the committees provided guidance, direction and oversight, and ensured suitable use of the reactor. The minutes provided a record of the safety oversight of reactor operations.

Records showed that the safety reviews were conducted at the TS required frequency. Topics of these reviews were also consistent with TS requirements to provide guidance, direction, and oversight, and to ensure acceptable use of the reactor.

The audit records showed that reviews had been completed in those areas outlined in the TS and at the required frequency.

The inspector noted that the safety reviews and audits and associated findings were acceptably detailed and that the licensee responded and took corrective actions as needed. The safety review and audit personnel qualifications were consistent with licensee administrative controls.

Since the last inspection the committee held two semiannual meetings at intervals not exceeding nine months, as required by TS 6.2.f. Violation number VIO 50-326/2000-01-01 is closed.

c. Conclusions

The review and audit program satisfied TS requirements.

4. OPERATIONS PROGRAM

a. Inspection Scope (Inspection Procedure 69001)

The inspector reviewed selected aspects of:

- operational logs and records
- staffing for operations
- selected operational, startup, or shutdown activities

b. Observations and Findings

Reactor operations were carried out following written procedures and TS. Information on operational status of the facility was recorded in log books and checklists as required by procedures and TS. Use of maintenance and repair logs satisfied pertinent requirements. Significant problems and events noted in the operations log were reported and quickly resolved as required by TS and administrative procedures.

Scrams were identified in the logs and records, and were reported and resolved as required before the resumption of operations under the authorization of a SRO.

The inspector verified that TS and procedure required items were logged and cross referenced with other logs and checklists as required, and that TS operational limits had not been exceeded.

Operation logs and records confirmed that shift staffing met the minimum requirements for duty and on-call personnel.

c. Conclusions

Operational activities were consistent with applicable requirements.

5. FUEL HANDLING

a. Inspection Scope (Inspection Procedure 69001)

The inspector reviewed selected aspects of:

- fuel handling procedures
- fuel handling equipment and instrumentation
- fuel handling and examination records

b. Observations and Findings

Procedures for refueling, fuel shuffling, and TS required inspections/surveillances were on hand ensuring controlled operations. Fuel movement, inspection, log keeping, and data recording followed the facility's procedures. Data recorded for fuel movement was clear and cross referenced in fuel and operations logs. Radiological controls and procedures conformed to health physics ALARA principles. Log entries clearly identified, as required by procedure, the minimum two persons present when moving fuel.

c. Conclusions

Fuel handling activities and documentation were as required by TS and facility procedures.

6. OPERATOR REQUALIFICATION

a. Inspection Scope (Inspection Procedure 69001)

The inspector reviewed selected aspects of:

- the Requalification Program
- operator licenses
- operator training records
- operator physical examination records
- operator examination records
- operator active duty status

b. Observations and Findings

All currently licensed SROs were successfully completing the emergency procedure and abnormal events training, reactivity manipulations, and participating in the ongoing training as required by the NRC-approved Requalification Plan. Training records contained the documentation required by the program. Review of records indicated that operator performance and competence evaluations had been given as required. Past test

questions covered the material prescribed by the program and demonstrated technical depth. Required quarterly operation hours, as SROs, were being tracked. Biennial medical exams had been performed as required.

c. Conclusions

The Requalification Program was being acceptably implemented. TS and NRC-approved Requalification Plan requirements were met.

7. SURVEILLANCE

a. Inspection Scope (Inspection Procedure 69001)

The inspector reviewed selected aspects of:

- surveillance and calibration procedures
- surveillance, calibration, and test data sheets and records
- reactor operations, periodic checks, tests, and verifications were observed.

b. Observations and Findings

Daily and other periodic checks, tests, and verifications for TS required LCOs were completed as required. With one exception, all surveillance and LCO verifications were completed on schedule as required by TS and in accordance with licensee procedures. All were within prescribed TS and procedure parameters and in close agreement with the previous surveillance results.

The monthly emergency exhaust shutdown system (EESS) operability verification had been incorporated into the daily startup checklist. The inspector confirmed that the reactor had not been operated without the EESS having been verified operational within the previous 30 days. VIO 50-326/2000-01-02 is closed.

During review of these periodic surveys the inspector identified an apparent TS violation. Section 4.4 Pool Water Level Channel of the UCI Technical Specifications states that: "The pool water level measuring channel shall be verified to be operable at intervals not to exceed two months."

Contrary to the above, from October 9, 2000 to January 11, 2001, a period exceeding two months the pool water level measuring channel was not verified to be operable. This failure constitutes a Severity Level IV Violation (Supplement I) VIO 50-326/2001-01-01.

Some of the daily and periodic checks of equipment operability included recording system parameters such as temperature, pressure, and flow. All values checked by the inspector satisfied the limits/parameters listed in the procedure or checklist.

c. Conclusions

The licensee's program for surveillance and LCO confirmations satisfied TS and licensee

administrative controls. One level IV Violation of TS surveillance requirements was identified.

8. **MAINTENANCE**

a. Inspection Scope (Inspection Procedure 69001)

The inspector reviewed selected aspects of:

- maintenance procedures
- equipment maintenance records

b. Observations and Findings

Routine/preventive maintenance was controlled and documented in the maintenance or reactor log consistent with the TS and licensee procedures. Unscheduled maintenance or repairs were reviewed to determine if they required a 50.59 evaluation. Verifications and operational systems checks were performed to ensure system operability before return to service.

During a facility tour the inspector noted that control and reactor room equipment was operational. No missing or malfunctioning equipment was noted.

c. Conclusions

Maintenance logs, records, performance, and reviews satisfied TS and procedure requirements. Facility condition was well maintained for its intended function and use.

9. **DESIGN CONTROL**

a. Inspection Scope (Inspection Procedure 69001)

The inspector reviewed selected aspects of:

- facility design changes and records
- facility configuration

b. Observations and Findings

Changes were controlled requiring a committee review, and were recorded and documented in the ROC minutes. The inspector reviewed an ongoing 50.59 for installation of new rod drive “stepping” motors. The facility modification evaluation and documentation satisfied NRC requirements and licensee procedures for a 50.59 change.

c. Conclusions

The licensee's design change procedures were in place and were implemented as required.

10. **PROCEDURES**

a. Inspection Scope (Inspection Procedure 69001)

The inspector reviewed selected aspects of:

- administrative controls
- records for changes and temporary changes
- procedural implementation
- logs and records

b. Observations and Findings

Operations procedures were available for those tasks and items required by the TS, license, and facility directives. Written changes were reviewed and approved as required. Oversight and review were provided by the reactor and university staffs as required by TS and licensee procedures.

Training of personnel on procedures and changes was acceptable. Personnel conducted TS activities in accordance with applicable procedures. Records showed that procedures for potential malfunctions (e.g., radioactive releases and contaminations, and reactor equipment problems) were implemented as required.

The inspector noted however, a number of mismatches between some written procedures and the present manner and frequencies in which some operations/surveillance activities were performed. It appears that some older (pre 1990 dated) licensee procedures (not TS required) had not been formally updated when newer practices were implemented. The RS and the Dean of Physical Science stated that the written procedures would be updated to match present practices or the activities would be performed as outline in the written procedures. This will be reviewed during a future inspection as an Inspection Follow-up Item (IFI 50-326/2001-201-01).

c. Conclusions

With the exception noted above the procedural control and implementation programs satisfied TS requirements.

11. **SECURITY**

a. Scope (81401 and 81431)

The inspector reviewed selected aspects of:

- the PPP
- security systems, equipment and instrumentations
- implementation of the PPP
- audits

b. Observations and Findings

The PPP was the same as the latest revision approved by the NRC. Physical protection systems (barriers and alarms), equipment, and instrumentation were as required by the PPP. Security checks, tests, verifications, and periodic audits were performed and tracked as required by the PPP. Corrective actions were taken when required. Access control was implemented as required by the PPP and licensee procedures. Acceptable security response and training, in accordance with procedures, were demonstrated through alarm and drill response and by enforcement officers' answers to the inspector's interview questions. Response rosters were current and posted as required.

c. Conclusions

Security facilities, equipment, and procedures satisfied PPP requirements.

12. EXIT MEETING SUMMARY

The inspector presented the inspection results to members of licensee management at the conclusion of the inspection on March 2, 2001. 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

*F. Gallagher III	Radiation Safety Officer, Environmental Health and Safety
*G. Miller	Reactor Supervisor
P. Rodgers	Senior Reactor Operator
*B. Smirl	Director, EH&S
*J. Stern	Dean, Physical Sciences
*J. Tripodes	Associate Director, EH&S
*K. Wolonsky	Associate Dean, Physical Sciences

* Attended Out briefing

INSPECTION PROCEDURE (IP) USED

IP 69001:	CLASS II NON-POWER REACTORS
IP 81401:	PLANS, PROCEDURES, AND REVIEWS
IP 81431	FIXED SITE PHYSICAL PROTECTION OF SPECIAL NUCLEAR MATERIAL OF LOW STRATEGIC SIGNIFICANCE

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

VIO 50-326/2001-01-01	Failure to verify the operability of the pool water level measuring channel at intervals not to exceed two months.
IFI 50-326/2001-201-01	Written procedures would be updated to match present practices or activities would be performed as in current procedures.

Closed

VIO 50-326/2000-01-01	As reported by the RS in a letter dated February 4, 2000, the ROC, failed to “meet at least semi-annually, at intervals not to exceed nine months” as required by TS 6.2.f. in that no meetings were held between those held September 1, 1998 and October 19, 1999.
VIO 50-326/2000-01-02	The reactor was operated on at least four occasions from June 1998 to January 2000, when the emergency exhaust shutdown system had not been verified operable within the preceding 30 days.

PARTIAL LIST OF ACRONYMS USED

LCO	Limiting Conditions for Operations
NRC	Nuclear Regulatory Commission
PPP	Physical Protection Program
ROC	Reactor Operations Committee
RS	Reactor Supervisor
TS	Technical Specifications
UCI	University of California - Irvine