

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

Reports No. 50-151/85-01(DRP); 50-356/85-01(DRP)

Docket Nos. 50-151; 50-356

Licenses No. R-115; R-117

Licensee: University of Illinois
214 Nuclear Engineering Laboratory
103 S. Goodwin Avenue

Facility Name: Advanced TRIGA (ATR)
Low Power Reactor Assembly (LOPRA)

Inspection Conducted: February 26-28, 1985

Inspectors: K. R. Ridgway *E. R. Schweibinz*
for

3-21-85

J. E. Foster

E. R. Schweibinz

Approved By: E. R. Schweibinz

J. E. Foster 3/21/85
3-21-85

Inspection Summary

Inspection on February 26-28, 1985 (Reports No. 50-151/85-01(DRP);
50-356/85-01(DRP))

Areas Inspected: Routine, unannounced inspection of records, logs, and organization; review and audit functions; requalification training; procedures; surveillance and maintenance; fuel handling activities; transportation activities; radwaste management control; emergency planning; followup action relative to Licensee Event Reports and previous open inspection items. This inspection involved a total of 32 inspector-hours by two NRC inspectors.

Results: One item of noncompliance was identified in one of the 10 areas inspected, training records (paragraph 5), and one deviation was identified in another area, building air monitoring (paragraph 12a).

DETAILS

1. Persons Contacted

- *G. H. Miley, Chairman, Nuclear Engineering Program
- *J. F. Stubbins, Chairman, Nuclear Reactor Committee
- *G. P. Beck, Reactor Supervisor
- *C. S. Pohlod, Senior Reactor Operator (SRO)
- P. E. Domagala, Reactor Operator

* Indicates those present at the exit interview.

2. General

This inspection, which began at 1:00 P.M. on February 26, 1985, was conducted to examine the research reactor program at the University of Illinois Nuclear Reactor Laboratory. The facility was toured shortly after arrival. The inspectors observed several reactor startups and shutdowns, and one pulsed operation during the inspection. The general housekeeping of the facility remains less than satisfactory, as was noted in the previous inspection (Inspection Report Nos. 50-151/84-01; 50-356/84-01).

3. Organization, Logs and Records

The facility organization was reviewed and verified to be consistent with the Technical Specifications and/or Safety Analysis Report (SAR). The minimum staffing requirements were verified to be present during reactor operation, and fuel handling or refueling operations.

The reactor logs and records were reviewed to verify that:

- a. Records were available for inspection.
- b. Required entries were made.
- c. Significant problems or incidents were documented.
- d. The facility was being maintained properly.

Since the last inspection, Dr. James F. Stubbins has been appointed Chairman of the Nuclear Reactor Committee, replacing Dr. P. K. Hopke. Dr. Stubbins is an Assistant Professor of Nuclear Engineering and has been a member of the committee. Two other members of the Nuclear Engineering Staff have been appointed to the Committee, Dr. D. N. Ruzic and Dr. A. M. Ougouag. The Reactor Supervisor and University Health Physicist are also Committee members.

Two licensed operators have left or are inactive in the reactor operations. This leaves the facility with two Senior Reactor Operators and one Reactor Operator. The licensee has established a new position of Reactor Operations Supervisor, filled by Mr. Pohlod, a Senior Reactor Operator (SRO). This organizational change has been made in anticipation of the retirement of Mr.

Beck, the Reactor Supervisor, in August, 1985. The licensee is advertizing for a replacement SRO for Mr. Pohlod, who will become the Reactor Supervisor at that time. In addition, the licensee is also establishing and advertizing for a faculty position, Reactor Director. The Reactor Supervisor will report to the incumbent who will be responsible for research activities at the facility.

No items of noncompliance or deviations were identified.

4. Reviews and Audits

The licensee's review and audit program records were examined by the inspector to verify that:

- a. Reviews of facility changes, operating and maintenance procedures, design changes, and unreviewed experiments had been conducted by a safety review committee as required by Technical Specifications or SAR.
- b. That the review committee and/or subcommittees were composed of qualified members and that quorum requirements and frequency of meetings had been met.
- c. Required safety audits had been conducted in accordance with Technical Specification requirements and that any identified problems were resolved.

A review of the Nuclear Reactor Committee meetings indicated the committee was meeting all requirements. An audit of facility records had been conducted by the Chairman and another committee member and the records were found to be satisfactory.

No items of noncompliance were identified.

5. Regualification Training

The inspector reviewed procedures, logs, and training records; and interviewed personnel to verify that the regualification training program was being carried out in conformance with the facility's approved plan and NRC regulations. Two regualification examinations had been conducted in 1984.

The approved regualification training program, dated January 10, 1975 states (in part) that the following records shall be kept on those individuals who have a current senior operators or operators license from the NRC: " (3) Copies of written exams administered (5) Evaluations of oral exams by the examiner including the date of the exam and the amount of time utilized". The licensee could not produce the last two examinations for 1984 and had not documented the evaluation of each individual's oral examination and performance. As noted above, interviews indicated that regualification exams had been performed. The individuals being regualified had passed regualification exams in prior years, and their qualifications were not considered as in question. This is considered to be a violation of the approved program (50-151/85-01-01).

One item of noncompliance was identified.

6. Procedures

The inspector reviewed the licensee's procedures to determine if procedures were issued, reviewed, changed or updated, and approved in accordance with Technical Specifications and SAR requirements. This review also verified:

- a. That procedure content was adequate to safely operate, refuel and maintain the facility.
- b. That responsibilities were clearly defined.
- c. That required checklists and forms were used.

The inspector determined that the required procedures were available and the contents of the procedures were adequate.

No items of noncompliance were identified.

7. Surveillance

The inspector reviewed procedures, surveillance test schedules and test records and discussed the surveillance program with responsible personnel to verify:

- a. That when necessary, procedures were available and adequate to perform tests.
- b. That tests were completed within the required time schedule.
- c. Test records were available.

The licensee's surveillance program appeared to be satisfactory; however, the last semiannual power calibration documentation was missing. A review of logs indicated that the calibration had been completed on schedule as a class project by a reactor operator. The operator had not returned the calibration data after it was graded as a project, and has since left the University. This is considered an open inspection item (50-151/85-01-02).

8. Experiments

The inspector verified by reviewing experiment records and other reactor logs that:

- a. Experiments were conducted using approved procedures and under approved reactor conditions.
- b. New experiments or changes in experiments were properly reviewed and approved.
- c. The experiments did not involve an unreviewed safety question, i.e., 10 CFR 50.59 requirements regarding experiments were met.

d. Experiments involving potential hazards or reactivity changes were identified in procedures.

e. Reactivity limits were not or could not have been exceeded during an experiment.

The inspector reviewed the one experiment approved since the last inspection.

No items of noncompliance were identified.

9. Fuel Handling

The facility fuel handling program was reviewed by the inspectors. The review included the verification of approved procedures for fuel handling and their technical adequacy in the areas of radiation protection, criticality safety, Technical Specification and security plan requirements. The inspectors determined by records review and discussions with personnel that fuel handling operations were carried out in conformance of the licensee's procedures.

No items of noncompliance were identified.

10. Transportation Activities

The inspectors reviewed records of radioactive material shipments made since the last inspection to determine that Department of Transportation (DOT) regulations were being followed in:

- a. The selection of the proper shipping containers.
- b. The preparation of packages for shipping.
- c. The records of shipments.

The inspectors reviewed the shipping records since the last inspection.

No items of noncompliance or deviations were identified.

11. Radiation Control

The inspector reviewed the radiation protection activities since the last inspection. Records were reviewed, personnel were interviewed, and observations were made to verify that radiation controls were being carried out in accordance with license and NRC regulations. The areas covered were:

- a. Posting and labeling of restricted areas and radioactive materials.
- b. Control of irradiated samples.
- c. Calibration of radiation detection instruments.
- d. Required periodic dose rate and contamination surveys.

- e. Exposure records of personnel.
- f. Posted areas of the facility.
- g. Personnel training.

The licensee has in place a new survey sheet that is used periodically and whenever surveys are required. A review of these records indicated regular surveys were being completed.

The inspectors noted that the area radiation monitoring system had been inoperative on three occasions in 1984. The reactor was not operated during these occasions. A new system will be installed in early 1985.

12. Radwaste Management

a. Gaseous Radwaste

According to the licensee's calculations, the average concentration of argon-41 released in calendar year 1984 was $2.44\text{E-}8$ microcuries per milliliter, which corresponds to approximately 2% of the Technical Specification limit.

The constant air particulate monitor (CAM) failed twice in 1984, and has not been operable for several months. The Technical Specifications, Section 3.4 requires one continuous air radiation monitor. The licensee indicated that they considered the stack air monitor as meeting the Technical Specification requirements. However, the Safety Analysis Report, (SAR) Section VII.B.8 states that building air will be monitored in addition to the air leaving the building. The licensee indicated they plan to replace the monitor in the near future. This is considered to be a deviation from SAR commitments (50-151/85-01-03).

b. Liquid Wastes

Potentially contaminated water is collected and stored in a 500-gallon holdup tank where it is sampled prior to release to the sanitary sewer. In 1984, less than 0.1 microcurie was released via liquid radwaste.

c. Solid Wastes

There have been no solid waste shipments. Spent resins are stored.

No items of noncompliance or deviations were identified.

13. Emergency Planning

The inspectors reviewed records and interviewed personnel to determine that the approved emergency plan was being carried out by verifying:

- a. That procedures were in place and required records were being kept.

b. That required drills were conducted and evaluated.

c. That required training was conducted.

The licensee's Emergency Plan was approved by the Division of Licensing on November 16, 1984. The licensee has 120 days to implement the plan. This area was not inspected.

No items of noncompliance or deviations were identified.

14. Licensee Event Reports Followup

Through direct observations, discussions with licensee personnel, and review of records, the following event reports were reviewed to determine that reportability requirements were fulfilled, immediate corrective action to prevent recurrence had been accomplished in accordance with Technical Specifications requirements.

(Closed) Licensee Event Report 50-151/84-03, Fast Transient Rod Failed to Scram August 16, 1984. This was the third rod sticking problem encountered. The previous fixes were to replace a loose set screw which had scored the inner surface of the dashpot housing. The second event was caused by a nylon shock absorber which was only two months old. The cause of the sticking was attributed to the deformation of the shock absorber and it was replaced with one of reduced diameter. The rod again failed to scram in October 1984. Again the shock absorber was found to be deformed. The shock absorber was replaced with one made of dense polyethylene, and has operated satisfactorily. With the Fast Transient Rod out of the reactor, the required shutdown margin is still available, and there are no Technical Specification drop time requirements for this rod.

15. IE Bulletin Followup

No IE Bulletins required followup during this inspection.

16. Followup on Previous Items of Noncompliance and/or Open Inspection Items

a. Closed (50-356/81-01-02) Open Item, LOPRA Technical Specifications should be amended to allow the delay of some surveillance tests if the facility is not in use. The licensee stated that the LOPRA was being used regularly and they do not plan to change the specifications at this time.

b. Closed (50-151/81-01-03) Open Item, Need annual documentation of operator oral examination and performance evaluation. This issue has been escalated to a violation (see paragraph 5).

17. Review of Periodic and Special Reports

The inspectors reviewed the following reports for timeliness of submittal and adequacy of information submitted:

Annual Report, LOPRA Reactor Report dated September 21, 1984.

Annual Report, Illinois Advanced TRIGA Reactor dated February 24, 1985.

The inspectors noted that the argon-41 average concentration to the environs and monthly range had not included the proper exponent (10^{-8}) by typographical error. This was called to the licensee's attention in a telecon on March 6, 1985.

No items of noncompliance were identified.

18. Fire Protection

The inspectors reviewed the status of the facility in regard to fire hazards, fire detection equipment, fire alarms, and fire fighting equipment. No NRC requirements pertain in this area, but the following observations were made:

- a. Several accumulations of flammable material were noted, including paper, lubricants, wood, flammable gases, and parafin.
- b. No fire or smoke detection equipment was present.
- c. A fire alarm box was available.
- d. Fire extinguishers were available.

19. Exit Interview

The inspectors met with the licensee representatives (listed in paragraph 1) at the conclusion of the inspection on February 28, 1985, and summarized the scope and findings of the inspection. The inspectors also discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspectors during the inspection. The licensee did not identify any documents or processes as proprietary.

The licensee acknowledged the following remarks by the inspectors at the meeting and by telecon following the meeting.

- a. The noncompliance regarding requalification training records (paragraph 5).
- b. The deviation from the SAR commitments for monitoring building air while the Constant Air Particulate Monitor (CAM) is out of service (Paragraph 12a).
- c. Several procedures were found to be out of date in that organization names, personnel and telephone numbers were obsolete. Although not presently required in the Technical Specifications, a periodic procedure review should be considered.