

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

Region I

Report No. 80-02
 Docket No. 50-225
 License No. CX-22 Priority -- Category G
 Licensee: Rensselaer Polytechnic Institute
Department of Nuclear Engineering and Science
Troy, New York
 Facility Name: Rensselaer Polytechnic Institute Critical Facility
 Inspection at: Maxon Road, Schenectady, New York and Troy, New York
 Inspection conducted: February 13-14, 1980
 Inspectors: T. F. Stetka 2/28/80
 T. F. Stetka, Reactor Inspector date signed
 _____ date signed
 _____ date signed
 Approved by: H. B. Kister 2/29/80
 H. B. Kister, Chief, Reactor Projects Section date signed
 No. 4, RO&NS Branch

Inspection Summary:

Inspection on February 13-14, 1980 (Report No. 50-225/80-02)

Areas Inspected: Routine, announced inspection of facility operations including facility procedures and records, surveillance testing, experiments, licensed operator requalification training, facility safety committee activities, and facility staff organization and administration. The inspection also included a facility tour, review of the 1978 Annual Report, review of licensee action on IE Bulletin 79-19, and previous inspection items. The inspection involved 15.5 hours onsite by one regional based inspector.

Results: Two items of noncompliance were identified (Infraction - absence of licensed operator in control room during facility operation; Deficiency - failure of NSRB to audit facility operation).

DETAILS

1. Persons Contacted

- *D. Harris, Facility Director
- *P. Nelson, Critical Facility Supervisor

Rensselaer students were also interviewed during the course of the inspection.

*present at exit interview.

2. Licensee Action on Previous Inspection Findings

(Closed) Followup Item (225/77-03-01): The licensee has written, approved and issued an administrative procedure that outlines operator responsibilities and methods for revising procedures and approving these changes.

(Closed) Unresolved Item (225/79-01-01): The inspector examined a letter dated August 30, 1979 from the Chief, NRC Operator Licensing Branch, to reactivate the license of the Facility Supervisor.

(Closed) Unresolved Item (225/79-01-02): The licensee's Reactor Operator Requalification Program dated May 27, 1976, was reviewed by the inspector as detailed in this report.

(Closed) Followup Item (225/79-01-03): The NSRB minutes for May 31, 1978 were reviewed and no discrepancies were identified.

(Closed) Followup Item (225/79-01-05): Review of the present Maintenance Log (see paragraph 5 of this report) indicates improved log keeping methods with all entries being signed and dated.

(Closed) Followup Item (225/79-01-06): The sign-off sheet for the Emergency Procedure briefings has been revised and is being utilized by all current students.

(Open) Followup Item (225/77-03-03): The licensee has designed and will be installing a pneumatic irradiation (Rabbit) facility. The testing of this facility has not commenced. Preliminary reviews in accordance with 10 CFR 50.59 have begun. Progress on this item will be reviewed on subsequent inspections.

(Closed) Unresolved Item (225/79-01-04): Review of NSRB meetings for August 31, 1979 and November 30, 1979 indicate that the proper quorum requirements are being adhered to.

3. Facility Tour

Upon arrival at the facility, the inspector accompanied a licensee representative on a facility tour of the following areas:

- Reactor Room;
- Fuel Vault;
- Control Room; and,
- Counting Room.

During the tour, the inspector observed the condition of these various areas of the facility for the general state of cleanliness, housekeeping and adherence to fire protection guidelines.

The inspector noted that the area gamma monitoring instrument for the control room was inoperable due to a failed detector. The licensee has instituted the use of a equivalent portable unit to monitor the control room while this instrument is being repaired. Use of the portable instrument is consistent with Technical Specification (TS) requirements.

No inadequacies were identified.

4. Organization and Administration

a. Personnel Changes

Two personnel have recently been licensed as Senior Reactor Operators and have joined the Critical Facility Staff. The membership of the Nuclear Safety Review Board (NSRB) and the Facility Director and Supervisor have not changed.

b. Review of Licensed Operators

The inspector conducted a review of the system employed by the licensee to assure that personnel assigned to critical facility operation who are required to have an NRC, RO and SRO license did in fact have such a license. The inspector verified that the minimum staffing requirements were satisfied. This was based on a review of the NRC license file and Operations Log Book entries and initials.

5. Logs and Records

The following logs and records were reviewed for the periods indicated.

- a. Scram Log for March 14, 1979 through February 8, 1980;
- b. Alarm Log for November 26, 1979 through February 13, 1980;
- c. Reactor Operations Log for March 14, 1979 through February 13, 1980;
- d. Maintenance Log for April 21, 1979 through February 13, 1980;
- e. Recorder Chart for reactor tank water temperature for June 8, 1979 through February 13, 1980;
- f. Recorder Charts for rod drop tests dated December 12, 1979; and,
- g. Voltage Plateau Curve for particulate air monitor dated January 7, 1980.

No inadequacies were identified.

6. Procedures

- a. The inspector reviewed the following procedures for technical adequacy and conformance with Technical Specification requirements:
 - Facility Operating Manual dated January 12, 1976;
 - Startup Checkout and Pre-Startup Checklist including the completed checklists for the period August 15, 1979 through February 13, 1980;
 - Reactor Startup Procedure;
 - Reactor Operations Procedure;
 - Reactor Shutdown Procedure;
 - Scram Recovery Procedure;
 - Fuel and Control Rod Handling Procedures;
 - Waste Disposal and Refill Procedures; and,
 - Bypass Condition Procedure.

As a result of these reviews the following items were identified.

- b. The Startup Checkout and Pre-Startup Checklist were not completely filled out on August 17, 1979, October 5, 1979, and October 31, 1979. Discussion with the licensee representative indicates that all requirements of the checklist were accomplished, however, personnel carelessness resulted in the incomplete lists. The representative stated that the other licensed operators would be reminded to complete the checklists. This item will be examined on subsequent inspections (225/80-02-01).
- c. The Startup Checkout Procedure requires in the Scram Check and Rod Drop section that scram testing which results in actual rod insertion be completed for a different parameter each normal operation day such that all four scrams (Intermediate Range, Power Channel, Reactor Door, and Console Key) be tested within a monthly period. Review of the completed checkout lists indicate the possibility that not all four scrams are tested within the monthly period.

The inspector also noted that the Annual Surveillance Checklist for the Interlocks and Scrams was not completed for the annual cycle ending in January, 1980. Discussion with the licensee representative indicated that these checks are performed prior to each startup when performing the Pre-Startup Checklist. Review of these checklists, as previously identified, confirmed the licensee's position, however, failure to complete some of these checklists could result in the failure to perform a scram test.

The licensee will revise the Pre-Startup Checklist to require all four actual scrams to be tested prior to each startup and will revise the annual surveillance procedure to state that these surveillances are performed during each reactor startup. This item is unresolved pending completion of the licensee's actions (225/80-02-02).

- d. The inspector observed the startup of the Critical Facility Reactor by students on February 13, 1980. This observation verified that the procedures in use accomplished their intended purpose and were the latest revision.

At approximately 6:30 P.M. on February 13, while the reactor was in a ready state for startup, the licensed operator left the control room to answer the telephone in an adjoining office. During the licensed operator's absence, the students commenced a reactor startup by pulling control rods from the fully inserted position to the 2 inch position. The inspector immediately notified the licensed operator of this action and the licensed operator immediately re-entered the control room and re-instructed the students to not operate any reactor controls unless the licensed operator is present at the controls. During this event the reactor did not attain criticality since rod motion was from position 0.0" to 2.0" and the estimated critical position for this reactor is approximately 16".

Failure to maintain control of facility operation by allowing operation of controls that affect reactivity of the reactor without the knowledge and consent of the licensed operator, and failure of the licensed operator to be present at the controls at all times during the operation of the facility are contrary to the requirements of 10 CFR Part 50.54(j) and (k) and is considered to be an item of noncompliance (225/80-02-03).

As a result of this event the licensee was issued Immediate Action Letter number 80-04 on February 15, 1980 that required the licensee to take and complete specified actions prior to resuming facility operation. The actions included licensed operator review of the pertinent requirements of the facility license and regulations relating to licensed operator presence in the control room, reinstruction of students, and relocation of communications equipment.

7. Surveillance

The inspector reviewed the facility's Surveillance and Maintenance Procedures and verified, by review of test documentation, the completion of the following tests and calibrations.

- Area Monitoring System Calibration completed on June 26, 1979 and August 24, 1979;
- Mobile Particulate Air Monitor Calibration completed on June 26, 1979 and January 7, 1980;
- Rod Drop Tests completed on May 31, 1979 and December 5, 1979;
- Water Fill and Dump Test completed on June 27, 1979 and January 14, 1980;
- Startup Channel Calibrations completed on January 4, 1980;
- Intermediate Level Channel Calibrations completed on January 14, 1980; and,
- Power Level and Safety Amplifier Calibrations completed on January 14, 1980.

Except for the item concerning the Annual Surveillance Checklist identified in Paragraph 6, no inadequacies were identified.

8. Experiments

The licensee has reconfigured the core in accordance with the "Core Fissile Inventory Reduction by Reconfiguration" procedure. The purpose of this reconfiguration was to provide a critical configuration with a fuel mass of less than 5000 grams. The reconfiguration was completed on August 10, 1979, with a core mass of 4951.92 grams. After a core reconfiguration, the Technical Specifications (TS) require measurement of control rod bank reactivity worth, temperature and void coefficients, reactor power, and shutdown margin. While the licensee representative stated that these tests had been performed, documentation for the temperature coefficient and reactor power measurements were not available. The licensee is completing a report of the new core which includes the results of these measurements. The report will be completed within two months. This item is unresolved pending review of the licensee's report (225/80-02-04).

9. Requalification Training

The licensee's Reactor Operator Requalification Program, dated May 27, 1976, was reviewed. The licensee has presently licensed two new operators (Paragraph 4). Requalification of these operators will be directed by this training program over a two year period in accordance with present NRC guidelines.

The inspector had no further questions on this item.

10. Nuclear Safety Review Board (NSRB) Review and Audits

The inspector reviewed the minutes of NSRB meetings conducted on August 31, 1979 and November 30, 1979. This review indicated that the NSRB is not conducting audits of reactor operations, operating procedures, and plant equipment performance as required by Technical Specification 6.2.7. e, f, and g. This is an item of noncompliance (225/80-02-05).

11. Closeout of IE Bulletin

Facility documents related to IE Bulletin 79-19, Packaging of Low-Level Radioactive Waste for Transport and Burial, were reviewed to verify the licensee's responses were timely, accurate and adequate.

No inadequacies were identified.

12. IE Circular Review

The licensee was given a copy of IE Circular 79-09, Occurrences of Split or Punctured Regulatory Diaphragms in Certain Self-Contained Breathing Apparatus, for their review. The inspector noted that the licensee does utilize the Scott Air Pak self-contained breathing apparatus described in the Circular. The licensee's action on this circular will be examined during subsequent inspections.

13. Review of Annual Report

The licensee's annual report dated March 1, 1979 and covering the period March, 1978 through February, 1979 was reviewed and no inadequacies were identified.

14. Unresolved Items

Unresolved items are those items for which further information is required to determine whether they are acceptable or items of noncompliance. Unresolved items are contained in Paragraphs 6b, 6c and 8 of this report.

15. Exit Interview

The inspector met with a licensee representative (denoted in Paragraph 1) at the conclusion of the inspection on February 14, 1980. The inspector summarized the scope and findings of the inspection as they are detailed in this report. During this meeting the items of noncompliance, Immediate Action Letter and unresolved items were discussed.