

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

REGION III

Report No. 50-150/81-01

Docket No. 50-150

License No. R-75

Licensee: Ohio State University

Facility Name: Nuclear Reactor Laboratory

Inspection Conducted: August 17 thru 21, 1981

C. E. Jones for
Inspector: K. R. Ridgway

9-18-81

D. C. Boyd
Approved By: D. C. Boyd, Chief
Reactor Projects Section 1A

9-21-81

Inspection Summary

Inspection on August 17 thru 21, 1981 (Report No. 50-150/81-01)

Areas Inspected: Routine, unannounced inspection of records, logs and organization; review and audit functions; requalification training; procedures; surveillance and maintenance; experiments; radiation protection program; radwaste management program; security program and implementation; material control and accountability; emergency plan; and followup action relative to IE Circulars; Licensee Event Reports and Open Inspection Items. This inspection involved a total of 60 inspector-hours (39 onsite) by one NRC inspector including 0 inspector-hours onsite during offshifts.

Results: No items of noncompliance were identified in 11 areas inspected.

DETAILS

1. Persons Contacted

*B. K. Hajek, Associate Director, Nuclear Reactor Laboratory
*R. D. Myser, Manager, Reactor Operations
J. Keagler, Senior Reactor Operator
D. E. Herring, Reactor Operator
D. J. Romer, Reactor Operator
N. Bandra, Supervisor, GSU Police Department
D. Powell, Radiation Safety Officer

2. General

This inspection, which began at 9:00 a.m. on August 17, 1981, with an overall examination of the reactor and other laboratory facilities to determine that required safeguards, radiation protection and operational safety measures were being carried out. Prior to the inspection all fuel and control rods had been removed from the reactor for the triennial inspection. Fuel was stored in the Pool Storage Pit and the rods in pool wall racks.

3. Organization, Logs and Records

The facility organization was reviewed and verified to be consistent with the Technical Specifications and/or Hazards Summary Report. 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. Required entries were made.
- b. Significant problems or incidents were documented.
- c. The facility was being maintained properly.
- d. Records were available for inspection.

Two licensed operators had recently left to take employment in the power generation industry. The licensee has three senior operators and two operators, who are licensed. At the present time, the licensee does not have plans to replace the terminated operators.

The inspector noted during a review of the reactor log books that on several occasions the RY-4 jumper was logged as installed for control rod worth experiments and not logged as being removed after the experiment was completed. This is not in conformance with procedure I-6, Use of Bypasses and Jumpers, which permits the removal

of RY-4 relay and the installation of a jumper before a reactor run is to be made requiring a single rod drop. At the end of the run, the jumper is removed and the relay replaced.

The RY-4 relay provides a fast period fast scram if a component in the period safety amplifier fails. However, when conducting a single rod drop, spurious signals also cause the RY-4 relay to drop the other rods. The relay must be removed and circuits jumpered when conducting a single rod drop experiment to prevent the other two rods being dropped. The relay and jumper do not affect the fast period or slow period scrams. The inspector was unable to determine if this relay removal and jumper installation, which is not discussed in the Hazards Summary Report (HSR) or Technical Specifications (T.S.), has been reviewed and approved by the Reactor Operations Committee. The licensee and the inspector are both pursuing the resolution of this matter. This is considered to be an unresolved item. (50-150/81-01-01).

No items of noncompliance 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 Hazards Summary Report.
- 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.

The proposed revisions to Chapter 2 of the HSR mentioned in a previous report^{1/} had been further modified and approved by the ROC on July 22, 1980 but had not been submitted to the Office of Nuclear Reactor Regulations (NRR) for approval. The inspector noted that the committee name had been changed to Reactor Operations Committee (ROC) and several subcommittees had been established.

The ROC had met six times since the last inspection, however, the committee did not meet between October 9, 1980 and February 26, 1981 a period of 140 days which exceeds the required frequency of quarterly meetings (92 + 23 days) specified in the approved revision of the HSR.

^{1/} IE Inspection Report No. 50-150/80-02

The audit subcommittee had reviewed operations and records for 1979 and 1980. An audit of the first half of 1981 had not yet been scheduled. The new approved HSR requires semiannual audits. The inspector noted that the ROC had extended the audit period to a full year from July 1979 to July 1980. The audit of July 1980 to January 1981 had been completed and reviewed. The ROC had established a log of audit findings and corrective actions taken in order to better track long term uncorrected items.

A subcommittee had been established to review the present audit system methodology. Another subcommittee had been established to review the radiation safety program at the Reactor Laboratory and to clarify the division of responsibilities between the Laboratory and the OSU Office of Radiation Safety (OSU-ORS) which has an overview-audit responsibility at this facility.

5. Requalification Training

The inspector reviewed procedures, logs and training records; and interviewed personnel to verify that the requalification training program was being carried out in conformance with the facility's approved plan and NRC regulations. Four requalification examinations had been conducted in September 1980.

The inspector noted that the operator experience record log established by Administrative Procedure, AD-10 was not kept current. The licensee stated this updating would be established on the Surveillance Maintenance Scheduling Board.

No items of noncompliance were 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 HSR 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.

The licensee had revised or retyped 16 procedures since the last inspection. Many procedures are still out of date and need revision.

The procedure index had been revised eliminating the titles of unwritten procedures. During the procedure review the inspector determined that:

- d. Procedure AP-6, Writing Procedures, did not address temporary penciled changes and there were many such changes noted in the present procedures. The procedure also did not address the required ROC approval requirement set forth in the revised HSR.
- e. Procedure AP-7, Review of Procedures, established a method of documenting that persons using the procedures have read and understand them. The procedure was not being followed, however, the inspector determined that each operator had received and reviewed the procedures. The licensee stated that a better method of documenting procedure reviews would be established.

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 the tests.
- b. That tests were completed within the required time schedule.
- c. Test records were available.

No items of noncompliance were identified.

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. No 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.
- d. Experiments involving potential hazards or reactivity change were identified in procedures.

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

No items of noncompliance were identified.

9. Refueling

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

No items of noncompliance were identified.

10. Radiation Control

The inspector reviewed records, interviewed personnel, and made observations and independent surveys to verify that radiation controls were being carried out in accordance with the licensee and NRC regulations. The areas covered were:

- a. Posting and labeling of restricted areas and radioactive materials.
- b. Control of irradiated sample.
- c. Calibration of radiation detection instruments.
- d. Required periodic dose and contamination surveys.
- e. Exposure records of personnel and posted areas of the facility.
- f. Personnel training.

In response to a previous inspection^{2/} the licensee had:

- g. Revised procedure RS-15, Orientation of Experimentors to Radiation Safety Procedures, to include the requirement for personal surveys after handling radioactive materials.
- h. Established the requirement to determine dose equivalent rates present during beam port experiments and to perform annual at power neutron leakage surveys.
- i. Obtained a new Eberline PC-4 smear counter that had resolved problems with smear counting.

^{2/} IE Inspection Report No. 50-150/80-01

- j. Moved the particulate air sampler closer to the exit port of the rabbit samples. Procedure RS-4, Particulate Air Sampling had been written (7/9/80) to require monthly particulate samples while at power. A review of records indicated that on two occasions the monthly sampling frequency had been exceeded by greater than 25 percent.

The inspector noted that the revised Procedure RS-15, Orientation of Experimentors to Radiation Safety Procedures, established a certification record sheet for all people trained. A review of these certification records indicated that several of the senior employees were not included. The licensee agreed to update these records. During the review of records it was noted that the overview and audit of dose rates and smear surveys by the OSU-ORS had not been made between July 80 and March 81. The existing HSR does not establish a frequency for these surveys, however, they have in the past been conducted monthly and since March, 1981 they have been conducted monthly. The ROC Subcommittee on Radiation Safety should establish a frequency for checks and audits by the OSU-ORS.

No items of noncompliance were identified.

11. Radioactive Effluents

The inspector reviewed records of gaseous and liquid releases since February 1980. One liquid release, 185 liters of pool water, was made on November 11, 1980. The release was made because the pool float controlled fill valve had stuck, overflowing the pool. The release was within 10 CFR 20.303 limits.

The licensee estimates gaseous releases (Argon-41) from the KWH produced and the building exhaust fan capacity. The estimated release in 1980 was 5.3 percent of that permitted by 10 CFR 20 for unrestricted areas.

Solid wastes are disposed of by the OSU-ORS.

No items of noncompliance were identified.

12. Security Program

On January 10, 1980, the licensee applied for and NRR approved License Amendment No. 9, dated June 16, 1980. The amendment concerned minor changes to the physical security plan. The inspector reviewed the approved plan and determined that the requirements of the plan were being carried out in the areas of:

- Physical Protection of SNM
- Security Organization
- Access Control
- Alarms Systems

Keys, Locks, and Hardware
Communications
Surveillance
Security Procedures
Security Program Review
Protection Against Sabotage

The inspector noted that five security procedures had been updated in 1981. Procedure SP-4, Security Orientation, included a requirement for security training and training documentation. A survey of these records indicated that several senior licensee employee's training had not been documented. A review showed that these employee's were the individuals who developed and administrated the Security Program. The licensee stated these records would be updated.

An inventory of assigned building keys indicated that several keys had not been turned in by employees no longer needing building access. The licensee stated the locks would be changed and a key inventory was established by placing it on the surveillance schedule board. The licensee has agreed to amended this in key control procedure to include the above noted changes. NRC will review this matter during the next inspection.

No items of noncompliance were identified.

13. Emergency Plan

The emergency plan had been revised and approved by the ROC to establish an in-out board for personnel regularly assigned to the Reactor Laboratory indicating their presence in or absence from the building. In addition the procedure had been revised to require a personnel search by the senior person on hand as he leaves the building during an emergency evacuation. This action was taken in response to a previous inspection of the emergency plan.^{3/} These matters are considered to be closed.

14. Material Control and Accounting

The inspector determined that the licensee had not received or shipped any fuel or SNM since the last material control and accounting inspection in August 1977.^{4/} During the inspection all fuel elements were stored in the fuel storage well at the bottom of the pool. The covers were removed and a visual count of the elements made. The inspector also reviewed inventory records and NRC-742 records.

No items of noncompliance were identified

^{3/} IE Inspection Report No. 50-150/80-03

^{4/} IE Inspection Report No. 50-150/77-02

15. 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 was accomplished, and corrective action to prevent recurrence had been accomplished in accordance with Technical Specifications.

On June 17, 1980 the licensee reported that the T.S. requirement that, "all circulating fans and air conditioning systems shall have the capability to be shut off from a single control in the control room," had not been met since one air conditioner for the multi-channel analyzer room did not have this emergency switch.^{5/} The air conditioner has been connected to the emergency switch. This item is considered to be closed.

16. IE Circular Followup

For the IE Circulars listed below, the inspector verified that the Circular was received by the licensee management, that a review for applicability was performed, and that if the circular was applicable to the facility, appropriate corrective actions were taken or were scheduled to be taken.

- a. IE Circular 79-08, Attempted Extortion-Low Enriched Uranium
- b. IE Circular 80-02, Nuclear Power Plant Staff Work Hours
- c. IE Circular 80-14, Radioactive Contamination of Plant Demineralized Water System and Resultant Internal Contamination of Personnel.
- d. IE Circular 81-02, Performance of NRC-Licensed individuals while on duty.

17. Unresolved Items

Unresolved Items are matters about which more information is required in order to ascertain whether they are acceptable items, Items of Noncompliance, or Deviations. An unresolved item disclosed during the inspection is discussed in Paragraph 3.

18. Exit Interview

The inspector met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on August 21, 1981, and the licensee acknowledged the inspection remarks as follows:

^{5/} Letter Robert Redmond OSO to J. G. Keppler RIII, dtd 6/17/80

- a. There has been an excessive number of instances where HSR commitments and/or internal procedures have not been followed in keeping with the newly approved revision of Chapter 2 of the HSR which states, "written procedures, reviewed and approved by a licensed Senior Reactor Operator shall be in effect and followed." Illustration of these failures to follow written procedures are:
- (1) Failure to keep the Operator Experience Log current, Procedure AP-10 (Paragraph 5).
 - (2) Failure to control the RY-4 relay removal and jumper installation, Procedure I-6 (Paragraph 3).
 - (3) Failure of the ROC to meet on a quarterly frequency, HSR 2.1.3 (Paragraph 4).
 - (4) Failure to document the review and knowledge of new and revised procedures, Procedure AP-7 (Paragraph 6).
 - (5) Failure on two occasions to meet the monthly particulate sample frequency, Procedure RS-4 (Paragraph 10).
 - (6) Failure to have complete radiation safety training records, Procedure RS-15 (Paragraph 10).
 - (7) Failure to have complete security training records, Procedure SP-4 (Paragraph 12).
 - (8) Failure of the OSU-ORS to provide check and audit services to the NRL, HSR 2.1.1 (Paragraph 10).

These items are considered to be a deviation, 50-150/81-01-02.

- b. The procedure, AP-6, Procedure Writing and Approvals, does not address the new requirement of the ROC to review and approve procedures nor does it establish the use of temporary changes to procedures.
- c. Although some 16 procedures have been revised or retyped in the new format, many procedures are still obsolete and others have no documentation of approvals. There is no procedure for the control and auditing of keys and locks.
- d. The unresolved item concerning the ROC review and approval for removing and jumpering the RY-4 relay was discussed at the close out and by telecon with the Reactor Manager on August 28 and 31, 1981.