U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-182/86001(DRSS); 70-152/86001(DRSS)

Docket Nos. 50-182; 70-152 Licenses No. R-87, SNM-142

Licensee: Purdue University
West Lafayette, Indiana

Facility Names: Purdue University Reactor; Fast Breeder Blanket Facility

Inspection At: West Lafayette, Indiana

Inspection Conducted: June 4-5, 1986

Inspectors: W. B. Grant for L. R. Greger 6-19-86
Date

W. J. Slawinski W. J. Slawinski 6/19/86
Date

Approved By: L. R. Greger, Chief L. R. Greger 6-19-86
Facilities Radiation Protection Section
Date

Inspection Summary

Inspection on June 4-5, 1985 (Reports No. 50-182/86001(DRSS); No. 70-152/86001(DRSS))
Areas Inspected: Routine unannounced inspection of operations, radiation protection, and transportation activities at the Research Reactor and the Fast Breeder Blanket Facility, including: organization, records, audits, instrument calibration, surveys, air sampling, surveillance tests, radiation protection procedures, transportation of highly enriched fuel elements, and emergency planning activities.
Results: No violations or deviations were identified.

DETAILS

1. Persons Contacted

*Dr. G. S. Born, Radiological Control Officer
*Dr. F. M. Clikeman, Nuclear Engineering, Director of Laboratories
*S. D. Hampton, Health Physicist
*V. L. Morris, Assistant Radiological Control Officer
*E. S. Stansberry, Reactor Supervisor

*Denotes those present at the exit interview.

2. General

The inspection began at 10:30 a.m. on June 4, 1986. The inspection was conducted to determine compliance with the operating licenses for the Research Reactor and the Fast Breeder Blanket Facility (FBBF), and with the radiation protection requirements for these facilities.

RESEARCH REACTOR

3. Organization, Logs, and Records

The facility organization was reviewed and verified to be consistent with the technical specifications. The minimum staffing requirements were verified to be present during reactor operations. The responsibilities for operation of the research reactor and the function of the Radiological Control Committee remain as described in Reports No. 50-182/81-01; 70-142/81-01.

Selected reactor logs and records were reviewed from January 1, 1986 to date 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.

There are two licensed operators at the reactor facility, Dr. G. S. Born and Mr. E. Stansberry. Dr. Born has been appointed Radiological Control Officer and Ms. V. Morris has been appointed Assistant Radiological Control Officer.

No violations or deviations were identified.

4. Review and Audits

The licensee's review and audit program records were reviewed and they verified that:

- Reviews of facility changes, operating and maintenance procedures, design changes, and experiments had been conducted by the Safety Review Committee as required by technical specifications or the Hazard Summary Report.

- The review committee and subcommittees were composed of qualified members and quorum requirements, and frequency of meetings had been met.

- Required safety audits had been conducted in accordance with technical specification requirements and identified problems were resolved.

The inspectors reviewed the minutes of the Committee on Reactor Operations (CORO) and its subcommittee meetings conducted December 1984, May, July, October, and December 1985, and March 1986. Meeting frequencies met the technical specifications requirement for a CORO or the subcommittee to meet quarterly, at intervals not to exceed four months, and the CORO to meet semiannually at intervals not to exceed 7.5 months.

An audit to determine conformance with technical specifications and applicable license conditions was last conducted by the licensee's Health Physics Department in July 1985. This audit, which is required to be performed annually, covered the period October 1984 to July 1985. The NRC inspectors reviewed the audit findings; no problems were noted.

No violations or deviations were identified.

5. Instrumentation and Equipment

The inspectors verified that the pool monitor, water process monitor, and console monitor alarm setpoints were set at their required alarm designation, and that each alarmed when a radiation source was used to test the monitor.

No violations or deviations were identified.

6. Surveillance and Tests

The inspectors selectively reviewed surveillance test schedules and test records, and discussed the surveillance program with licensee personnel to verify:

- That when necessary, procedures were available and adequate to perform the tests.

- The tests were completed within the required time schedule.

- Test records were available.

- Any problems noted were corrected.

The Reactor Supervisor maintains a monthly ticker card file for surveillances due. In addition, a wall mounted status board contains color coded tags (TS required and non-TS required) for surveillances and tests to be completed during a three-month period.

No violations or deviations were identified.

7. Posting and Control

Posting and labeling required by regulations in the reactor building and the FBBF were in place.

No violations or deviations were identified.

FAST BREEDER BLANKET FACILITY (FBBF)

8. FBBF Operations

The Nuclear Engineering Laboratory Director continues to be responsible for operation of the FBBF and for devising the experiments performed by a small group of approved graduate students.

The operation and function of the FBBF remains as described in previous inspection reports (50-182/81-01, 70-152/81-01; and 50-182/82-02; 70-152/82-02). No significant functional or operation changes have taken place. The licensee has taken the following action in response to previous inspector concerns:

- The end window counter used for detecting personal contamination is being used without the cap over the end window so that low level beta radiation will be detected.

- Surgeons gloves used for handling uranium in the ventilation hood are surveyed before reuse or they are disposed of without being reused.

- Air samplers from hood exhaust systems are operational when hoods are in use.

No violations or deviations were identified.

RADIATION PROTECTION

9. Organization

The Radiological Control Officer and his staff are responsible for radiation protection at the reactor and FBBF. The program includes periodic smear surveys, calibration of fixed and portable instruments, personal and area dosimeter measurements, air sampling, and waste management.

No violations or deviations were identified.

10. Instrument Calibration

Records indicated that portable survey instruments used in the FBBF and reactor areas received multi-point calibrations at six-month intervals in 1985 and 1986 to date. The three area radiation monitors and the continuous air monitor in the reactor room were also calibrated during the last six months. All instruments examined by the inspectors bore stickers indicating the most recent calibration dates.

No violations or deviations were identified.

11. Surveys

Direct radiation surveys and smear surveys for alpha and beta contamination are conducted monthly in the FBBF and reactor areas. Survey records were reviewed; no problems were noted.

No violations or deviations were identified.

12. External Radiation Control

Film badges supplied by a vendor are required for individuals working in the reactor room and the FBBF. Records indicated that the maximum whole body dose to any individual in 1985 and 1986 to date was less than 50 mrems. Finger badges required during fuel handling indicated a maximum individual extremity exposure of about 500 mrems for 1985.

No violations or deviations were identified.

13. Air Sampling

Exhaust air from the reactor room is sampled with a continuous air sampler located near the pool. Records indicate that gross alpha/beta concentrations are typically about 1E-15 uCi/ml. The air exhausted from the reactor room passes through a HEPA filter. The HEPA filter and two prefilters are periodically checked and changed when reduced flow rates are noted.

In the FBBF area, air is sampled upstream and downstream of the HEPA filters in the exhaust ducts from the FBBF and the ventilated hood. A sampler is also located in the hood. Air samples are taken from the ventilated hood and the HEPA filters in the hood exhaust when work in the hood is in progress. Records indicate the concentrations range between 1E-12 and 1E-13 µCi/ml.

No violations or deviations were identified.

14. Transportation Activities

On February 20, 1986, the licensee shipped 24 fuel plates to Oak Ridge, Tennessee for storage. This was in response to a Commission Order to reduce the quantity of highly enriched uranium (HEU) onsite to that necessary for normal operations. The inspectors reviewed records of the shipment, which used a DOT approved 6 M shipping container and was shipped in a University van. The Radiological Control Officer and the Reactor Supervisor accompanied the shipment. No problems were noted. No other shipments of radioactive material have been made since the last inspection.

The licensee maintains current copies of DOT and NRC regulations governing the transportation of radioactive materials.

No violations or deviations were identified.

15. Emergency Planning

During August 1985, the University conducted a walk through drill of handling an injured contaminated person. The drill participants included: fire department, police, reactor operations, health physics, and University hospital personnel. A drill is planned for mid-1986 involving the same participants. The Research Reactor Emergency Plan was approved by the NRC on November 11, 1984.

No violations or deviations were identified.

16. Exit Meeting

The inspectors met with licensee representatives (denoted in Paragraph 1) on June 5, 1986. The inspectors summarized the scope and results of the inspection and discussed the likely content of the inspection report. The licensee acknowledged the information and did not indicate that any of the information disclosed during the inspection could be considered proprietary.