

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

REGION III

Report No. 50-156/79-02; 70-134/79-01

Docket No. 50-156; 70-134

License No. R-74; SNM-116

Licensee: University of Wisconsin
Madison, Wisconsin 53705

Facility Name: University of Wisconsin Nuclear Reactor

Inspection At: Madison, Wisconsin

Inspection Conducted: July 31-August 2, 1979

Inspector:

N. E. DuBry
N. E. DuBry

24 August 1979

Approved By: *L. R. Greger*
L. R. Greger, Acting Chief
Fuel Facility Projects and
Radiation Support Section

8/24/79

Inspection Summary

Inspection on July 31-August 2, 1979 (Report No. 50-156/79-02; 70-134/79-01)

Areas Inspected: Routine, unannounced inspection of radiation protection and radwaste management program, including: audits; training; radiation protection procedures; instruments and equipment; exposure control; posting, labeling, and control; surveys; notifications and reports; qualifications; and effluent controls. The inspection involved 16 inspector-hours on site by one NRC inspector.

Results: No items of noncompliance or deviations were identified.

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DETAILS

1. Persons Contacted

*R. J. Cashwell, Supervisor, Nuclear Reactor
*C. W. Maynard, Director, Nuclear Reactor
S. M. Matusewic, Reactor Operator
M. Baumann, University Health Physicist

*Denotes those present at exit interview.

2. General

This inspection, which included a visual observation of facilities and equipment, posting, labeling, and access controls began at 10:30 a.m. on July 31, 1979. The purpose of the inspection was to examine the radiation protection and radwaste aspects of routine facility operations. No abnormalities were noted during the visual observations. During the inspection the licensee was conducting Reactor Physics Testing having just completed loading a full size, all FLIP core. No problems were noted.

3. Radiation Protection Organization

Health physics functions at the reactor facility are performed by the reactor operators. Routine surveys, sample collection and analysis, and calibrations are conducted on an assigned basis in accordance with UWNR-100. There has been an addition of four reactor operators to the reactor facility.

No problems were noted.

4. Logs and Records

The following logs and records were reviewed:

- a. Annual Operating Reports for Fiscal Years 1977-1978 and 1978-1979.
- b. Minutes of the Reactor Safety Committee Meetings - December 1977 to May 1979.
- c. Monthly Surveillance Checksheets (UWNR-100) - March 1978 to June 1979.
- d. Transfer of Radioisotopes from R-74 to other Licensee Accountability (UWNR-130, Request for Isotope Production) - July 1978 to June 1979.

- e. Monthly Personnel Exposure Reports from Vendor - January 1978 to May 1979.
- f. Environmental Monitoring TLD Report from Vendor - December 1977 to June 1978.
- g. Operating Logs from June 1978 to June 1979.

5. Audits

A designated University Health Physicist audits the reactor radiation safety program monthly and incorporates the results into the minutes of the Reactor Safety Committee (RSC) meetings. It was noted that no items requiring corrective action were identified during these audits.

6. Training

Radiation protection and radwaste handling is incorporated into the ongoing training for the reactor operators. Students in the laboratories do not receive a comprehensive health physics orientation, but are supervised by staff personnel.

7. Instrumentation and Equipment

Documentation indicating compliance with the following technical specification requirements were reviewed; no problems were identified.

- a. Control room readout instrumentation required by Technical Specification 5.4.a and 5.4.b.
- b. Ventilation system operability checks required by Technical Specification 4.2.4.
- c. Calibration and operability checks of area radiation monitors required by Technical Specification 4.2.3.
- d. Operability of area radiation and gaseous effluent monitors required by Technical Specification 3.4.

A verification of calibration source strength^{1/} was conducted by the licensee on April 21, 1978. RSC Log No. 177 (1978) indicated: (1) the licensee calibrated a portable instrument on the reactor calibration range and then checked it against the UW Safety Department calibration source, (2) the reactor source was originally set up with an "R" meter and subsequently checked with TLD dosimetry, (3) the source was determined to be old enough (1958) to show no transient results

^{1/} IE Inspection Report No. 50-156/78-02; No. 70-134/78-01.

from impurities. On further investigation the inspector noted a similar verification of the UW Safety Department source was completed on April 22, 1979. NBS (National Bureau of Standards) traceability will be pursued further during a future inspection.

The calibration of portable survey instruments at higher ranges was discussed with the licensee at the exit interview.^{2/}

No items of noncompliance or deviations were identified.

8. Personal Dosimetry and Environmental Monitoring

A review of the licensee's monthly personal dosimetry records for the period from January 1978 to May 1979 revealed no problems. For CY 1978 the records indicated the maximum whole body dose was 185 mrems and the maximum skin dose was 330 mrems. These records also show agreement with the annual reports for FY 1977-1978 and FY 1978-1979. Records and conversations with the reactor supervisor indicate there have been no neutron exposures to date.

The licensee places thirty-three thermoluminescent dosimeters at various locations in and around the facility. These dosimeters are evaluated quarterly. No significant elevated results or trends were noted.

No items of noncompliance or deviations were noted.

9. Surveys

A review of survey and analysis results for the period from March 1978 to June 1979 indicates that the licensee is conducting air and water sampling, and swipe and direct radiation surveys in accordance with technical specifications.

No items of noncompliance or deviations were noted.

10. Reports and Posting

Posting of notices to workers as required by 10 CFR 19.11 was generally satisfactory. A review of other postings during the tours indicated they were adequate.

Reviewing the annual reports for FY 1977-1978 and FY 1978-1979 showed that the licensee satisfied the following Technical Specifications:

- a. Summary of radiation exposures (TS 6.7.2.g).

^{2/} Ibid.

- b. Radioactive waste disposal (TS 6.7.2.f).
- c. Changes in facility or procedures pursuant to 10 CFR 50.59 (TS 6.7.2.e).
- d. Emergency shutdown and inadvertant scrams (TS 6.7.2.c). These were compared against the operator logs and special report UWNR-115 (scram or unscheduled shutdown).

No items of noncompliance or deviations were noted.

11. Radioactive Releases

There has been one solid radwaste transfer since the last inspection. During 1978, 13.4 cubic feet of solid radioactive waste was transferred to the University Health Physicist. This material, with a total activity of 141 microcuries, was transferred to an authorized commercial vendor for disposal on May 25, 1978.

Four liquid radwaste releases to the sanitary sewer have been made since the last inspection. These releases were made on April 21, 1978, September 11, 1978, February 7, 1979, and June 5, 1979. Release concentrations and total activity were a small fraction of 10 CFR 20.303 limits.

Gaseous and particulate radioactivity in the filtered stack effluents are measured by a stack monitor. Releases since the last inspection have been a small percentage of the technical specification limits.

No items of noncompliance or deviations were identified.

12. SNM-116

All sources held under this license are stored and used in the reactor building. Review of leak test and accountability records indicate that the licensee is satisfying technical specification requirements.

No problems were identified.

13. Radiation Protection Procedures

The inspector reviewed changes made to several procedures since the previous inspection to verify they were consistent with good health physics practices.

The following procedures were reviewed:

UWNR-004, Rev. 1 University of Wisconsin Reactor Operator Proficiency Maintenance Program

UWNR-005, Rev. 4 UWNR Administrative Guide

UWNR-100, Rev. 9 Surveillance Activities

UWNR-100A, Rev. 4 PM Services-Definitions

UWNR-100B, Orig. Solid Waste Disposal Record

UWNR-100C, Rev. 2 Procedure for Gross Gamma Counting of Water Samples

UWNR-109, Rev. 5 Procedure for Liquid Waste Disposal

UWNR-109A, Rev. 2 Worksheet for UWNR-109

UWNR-110A, Rev. 18 Daily Reactor Pre-Startup Check List*

*This procedure will be revised following completion of physics testing on new core

UWNR-111, Rev. 6 Air Monitoring Operating Procedure

UWNR-130, Rev. 9 Request for Isotope Production*

*Three copies are now generated to improve isotope accountability. One is kept at the reactor facility, one goes to the University Health Physics office, and the last is kept with the sample.

UWNR-131, Rev. 9 Production of Radioisotopes in the Nuclear Reactor

UWNR-132, Rev. 3 Pneumatic Tube Operating Procedures

UWNR-134, Rev. 2 Request and Authorization for Services of the University of Wisconsin Reactor*

*To have material irradiated the user must have approval of the University of Wisconsin Health Physics office to receive the product and site authorization must be on file at the reactor facility.

UWNR-136, Rev. 1	Procedure for Beam Port or Thermal Column Irradiations
UWNR-137, Orig.	Porpoise Tube Operating Procedure
UWNR-138, Orig.	Radiation Basket Operating Procedure
UWNR-139, Rev. 2	Whale Tube Operating Procedure
UWNR-143, Orig.	Procedure for Fuel Handling and Core Arrangements
UWNR-150, Rev. 4	Reactor Accident Fission Product Release or Major Spill of Radioactive Material
UWNR-151, Rev. 7	Leak Resulting in Draining of Reactor Pool
UWNR-152, Rev. 5	Suspected Fission Product Leak
UWNR-157, Rev. 1	Fire, Radioactive Material Spills, Radioactive Dust, Fumes, and Gas; Personnel Injuries Involving Radioactivity, and Personnel Over-exposures.
UWNR-171, Rev. 7	Air Monitor Calibration Procedures and Records
UWNR-171A, Rev. 1	Reactor Lab Exhaust Flow Measurement for Air Monitor Calibration
UWNR-172, Rev. 1	Sampling and Calibration Procedure - Air Particulate Activity Samples
UWNR-175, Rev. 5	CAM Calibration Check
UWNR-176, Rev. 3	Radioactive Source Leak Check

No problems were noted.

14. Exit Interview

The inspector met with the licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on August 2, 1979. The following matters were discussed:

- a. The purpose and scope of the inspection.
- b. The need to calibrate portable survey instruments at higher ranges to have available adequate instrumentation for emergency

use. (Paragraph 7)^{3/} The following was the result of this discussion with the licensee representatives:

- (1) He was unable to meet a previous commitment^{4/} because the intended calibration equipment configuration was not compatible with the portable survey instruments.
- (2) He did not wish to send any instruments to an outside vendor for calibration.
- (3) New equipment was being purchased and he would be able to calibrate portable survey instruments at higher ranges by approximately April 1980.

This final item is a concern of the inspector as to whether the licensee can meet the spirit of the emergency response plans.

3/ IE Inspection Report No. 50-156/77-02; No. 70-134/77-02; and Report No. 50-156/78-02; 70-134/78-01.

4/ IE Inspection Report No. 50-156/78-02; No. 70-134/78-01.