

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

REGION III

Report No. 50-123/80-03

Docket No. 50-123

License No. R-79

Licensee: The Curators of the University of Missouri - Rolla
Rolla, MO 65401

Facility Name: University of Missouri - Rolla Reactor

Inspection At: Rolla, MO

Inspection Conducted: September 9-10 1980

Inspector: *R. A. Paul*
R. A. Paul

10/2/80

Approved By: *W. L. Fisher*
W. L. Fisher, Chief
Fuel Facility Projects and
Radiation Support Section

10/2/80

Inspection Summary:

Inspection on September 9-10, 1980 (Report No. 50-123/80-03)

Areas Inspected: Routine, unannounced inspection of radiation protection program, including: qualifications; audits; training; radiation protection procedures; instruments and equipment; exposure control; posting, labeling, and control; surveys; notifications and reports; solid radwaste; and radioactive effluent releases. The inspection involved fifteen inspector-hours onsite by one NRC inspector.

Results: In the areas inspected, no items of noncompliance or deviations were identified.

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DETAILS

1. Persons Contacted

*Dr. E. M. Spokes, Acting Dean of School of Mines and Metallurgy
*Dr. D. R. Edwards, Director, Nuclear Reactor Facility
*Dr. N. T. Tsoulfanidis, Radiation Safety Officer
*Mr. A. Vaughn, Director of Administrative Planning
Mr. A. E. Elliott, Reactor Manager
*Mr. R. Bono, Health Physicist
Mr. R. L. Jones, Reactor Operator
Mr. D. Carter, Health Physics Technician

*Denotes those present at the exit interview on September 10, 1980.

2. Licensee Action on Previous Inspection Findings

(Closed) Deficiency (50-123/79-03). Corrective action taken. Licensee records indicate social security numbers and birth dates have been entered onto NRC-5 forms.

(Closed) Deficiency (50-123/79-03). Corrective action taken. All required records are maintained and complete.

(Closed) Deviation (50-123/79-03). Corrective action taken. All required swipe tests have been performed monthly from November 1979 through August 1980.

(Closed) Deviation (50-123/79-03). Corrective action taken. All required monthly surveys have been performed from November 1979 through August 1980.

(Closed) Deviation (50-123/79-03). Corrective action taken. Pool water has been tested monthly from November 1979 through August 1980.

(Closed) Deviation (50-123/79-03). Corrective action taken. All health physics instruments have been calibrated quarterly from January through August 1980.

3. General

This inspection, which began with visual observation of facilities and equipment, posting, labeling, and access controls at 8:00 a.m. on September 9, 1980, was conducted to examine the routine radiation protection and radwaste management programs. During the initial tour, no discrepancies from posted readings were noted, and housekeeping was satisfactory. Radiation control appeared to be adequate; however, the inspector noted that persons were drinking coffee while attending a lecture in the Reactor Bay area. (Refer to Paragraph 7.)

4. Qualifications

The health physics staff consists of a Radiation Safety Officer (RSO), a full-time health physicist and a part-time health physics technician, all of whom appear to be aware of their responsibilities and to possess the expertise to handle routine matters and emergencies at the facility.

In accordance with a letter dated November 8, 1979, from the RSO to the Reactor Manager, the responsibility for radiation protection surveillance is shared between the health physics staff and reactor operators. In a discussion with licensee representatives concerning the effectiveness of the health physics program when sharing responsibilities, the inspector was told that as long as health physics can provide expertise they feel the program is effective, although not the ideal arrangement, and hopefully the health physics staff will assume more of the routine functions in the future.

5. Licensee Audits

Records of independent audits conducted on December 10, 1979, and May 1-2, 1980, and monthly audits made by the Health Physicist were reviewed. The independent audit includes a review for compliance with technical specification requirements, various records, checklists, and health physics. The monthly health physics audit ensures that all health physics duties assigned to reactor personnel are accomplished.

The inspector also reviewed the minutes of the quarterly Safety Committee meetings from December 18, 1979 to September 9, 1980.

No significant safety findings were made by the audits nor were any significant problems noted by the Safety Committee.

No items of noncompliance or deviations were identified.

6. Training

Members of the reactor staff have received radiation protection training and training under 10 CFR 19.12. Students and new employees receive 10 CFR 19.12 training at the reactor facility through a tape and formal presentations, from the university Health Physicist, and from formal university courses. A signed record is maintained of those who have listened to the tape and of those who received the Health Physicist's indoctrination course. These records show that several persons who were in the second day of reactor operations training at the facility had not listened to the tape presentations; however, they had been escorted whenever in the reactor area. The Health Physicist stated these students would receive their indoctrination during the first week of attendance.

The inspector listened to the tape presentation and noted that all 10 CFR 19.12 requirements were not covered; specifically, no section concerning health protection problems with exposure to radiation was given, although, it appeared to the inspector that the other requirements are covered in the tape. In that training is provided by three different sources, the licensee does not have adequate mechanisms to ensure that all persons entering the restricted areas of the reactor facility have received the required training. The licensee acknowledged this observation and agreed to evaluate the training program. This matter will be reviewed at a future inspection.

On December 10, 1979, a licensee representative from the University of Missouri-Columbia gave a training session on current requirements for packaging and transporting radioactive wastes and material.

No items of noncompliance or deviations were noted.

7. Radiation Protection Procedures

Radiation protection procedures are part of the Standard Operating Procedures. One of the responsibilities of the Health Physicist is to review and upgrade some of these procedures. This has not been accomplished since the last inspection, but is one of the objectives the Health Physicist will attempt to accomplish in the near future. The inspector reviewed several of these procedures and pointed out at the exit interview that they are not comprehensive and that many of them are loosely written and incomplete. The licensee will evaluate the adequacy of the procedures. This matter will be reviewed during a future inspection.

During the initial tour of the Reactor Bay area, the inspector observed that some persons attending classes were drinking coffee. Although the licensee's "Handbook of Radiological Operations" does not specifically restrict these activities, they are discouraged. When this matter was brought to the licensee's attention at the exit interview they responded that this matter will be reviewed by responsible licensee personnel. This item will be reviewed during a future inspection.

8. Exposure Control

Beta, gamma, and neutron sensitive film badges used for routine personal monitoring for reactor personnel are processed biweekly. Visitors are issued self-reading pocket dosimeters. TLD ring badges are available for special jobs to measure extremity exposures, however, none had been issued since the last inspection. Film badge records reviewed for the period November 1979 through July 1980 indicated that most whole body exposures were minimal and that the highest whole body exposure was 210 mrem for the year 1980 to date. No extremity exposures were noted.

Forms NRC-4 are not maintained and all the required information was noted to be on Forms NRC-5.

Although the licensee has no requirements for a routine bioassay or an in vivo program, other than 10 CFR 20.103(c) requirements, bioassays are submitted from those persons using byproduct material in excess of the limits listed in the licensee's "Handbook of Radiological Operations."

The licensee does not have a formal program to achieve ALARA. However, their surveillance program is such that they are aware of radiation and airborne activity areas and precautions are taken to prevent unnecessary personal exposures.

No items of noncompliance or deviations were noted.

9. Posting, Labeling, and Control

During facility tours, the inspector reviewed the licensee's compliance with posting and labeling requirements of 10 CFR 20.

A portal monitor is provided for use when leaving the work area; however, it was noted that some persons leave the Reactor Bay area through another door without monitoring. The matter was brought to the attention of the Director, Nuclear Reactor Facility, who stated that persons who physically handle radioactivity or come in contact with radioactive materials are required to use the portal monitor, but not those just entering the facility to attend classes or to visit.

No items of noncompliance or deviations were noted.

10. Receipt and Transfer of Materials

No radioactive material was received or shipped off campus under the Reactor License in CY 1979 or 1980 to date. In 1980 there were four transfers of byproduct material from the reactor facility to the University Broad License, three of which were solid radioactive waste and one was a sealed source transferred intra-campus.

No items of noncompliance or deviations were noted.

11. Surveys and Measurements

Direct radiation surveys and smear samples are performed monthly. A review of the licensee's records for the period December 1979 through August 1980 indicates they were accomplished at the required frequency. No problems were noted.

A review of the monthly pool analyses and semiannual wipe tests of sealed sources for November 1979 to August 1980 indicated they were accomplished at the required frequency. No problems were found.

It was noted that no tritium analyses had been made of the pool water for several years. This matter was discussed in the exit interview. The licensee stated they now have the capability to analyze for tritium and will do so every six months.

No items of noncompliance or deviations were noted.

12. Instruments and Equipment

The licensee has portable survey instruments capable of measuring beta-gamma and neutron dose equivalent rates. Instruments on hand bore current calibration stickers and have the ranges required by the Technical Specifications. Records show that portable instruments and area radiation monitors had been calibrated.

Three new radiation area monitors have been installed in those areas required by Technical Specification 5.7 since the previous inspection. Two initiate area alarms and one initiates a reactor building evacuation alarm.

No items of noncompliance or deviations were identified.

13. Notifications and Reports

Review of records and discussion with licensee representatives indicated no problems regarding compliance with NRC reporting requirements.

14. Radioactive Effluent Measurements and Releases

The licensee's liquid effluent is the result of mixed bed resin regeneration. Liquid waste is collected in tanks, sampled, and analyzed to permit more accurate effluent determination before discharge to the sanitary sewer. Records show that from January 1, 1980, to August 1, 1980, a total of about 446 microcuries of activity was released from four resin regenerations.

The licensee evaluates airborne releases monthly. Release of gaseous and particulate activity through the building exhaust is determined by relating operating times of the building exhaust fans and reactor power to previously measured air activity at maximum reactor power. Licensee records indicate that 2 millicuries were released in November and December 1979 and 29 millicuries were released between January and August 1980, at a maximum concentration of $1.5 \text{ E-}8 \text{ } \mu\text{Ci/ml}$.

No items of noncompliance or deviations were identified.

15. Solid Radwaste

This program generates little solid waste. Most waste, being short-lived and low-level, is held for decay until no detectable activity remains. Radwaste from this program is transferred to the University of Missouri Broad License. This material is disposed of to a licensed vendor.

No items of noncompliance or deviations were identified.

16. IE Bulletin 79-19

A specific review of the licensee's action on implementing the requirements set forth in Bulletin 79-19 determined that the licensee had met these requirements for the reactor license.

17. Exit Interview

The scope and findings of the inspection were discussed with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on September 10, 1980.

The following matters were also discussed.

- a. The licensee agreed to analyze for tritium content of the fuel pool water every six months. (Paragraph 11)
- b. The licensee will review the training program to ensure that all 10 CFR 19.12 requirements are met. (Paragraph 6)
- c. The licensee will review the comprehensiveness of the current Radiation Protection Procedures and the need for strengthening these procedures. (Paragraph 7)
- d. The licensee will determine if eating, drinking, and smoking in the reactor area is to be allowed. (Paragraph 7)

All comments made by the inspector were acknowledged at the meeting.