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

Report No. 50-148/78-01

Docket No. 50-148 License No. R-78

Licensee: University of Kansas
P. O. Box 2067
Lawrence, Kansas 66044

Facility Name: University of Kansas, Bendix Pool Reactor

Inspection At: University of Kansas, Lawrence, Kansas

Inspection Conducted: October 4-6, 1978

Principal Inspector: M. W. Dickerson
M. W. Dickerson, Reactor Inspector — Date: 10/13/78

Reviewed By: G. L. Madsen
G. L. Madsen, Chief, Reactor Operations — Date: 10/13/78

Inspection Summary

Inspection on October 4-6, 1978 (Report No. 50-148/78-01)
Areas Inspected: Routine, unannounced inspection of organization, logs and records; review and audit; requalification training; procedures; surveillance; refueling; experiments; radiation control; environmental; Emergency Plan; follow-up on inspector identified problems; and follow up on items of noncompliance. The inspection involved 22 inspector-hours on-site by one (1) NRC inspector.

Results: Of the twelve areas inspected, no items of noncompliance or deviations were found in eleven areas; one apparent item of noncompliance was found during review of records for fuel inspection activities (Infraction - failure to follow procedure, paragraph 10).

DETAILS

1. Persons Contacted

*B. Friesen, Radiation Safety Officer (Acting)
*D. Kraft, Dean
*R. Mesler, Reactor Supervisor
J. Price, Radiation Safety Technician
*H. Woody, Reactor Operator

*Denotes those present during the exit interview.

2. Licensee Action on Previous Inspection Findings

(Closed) Noncompliance (77-02): Records for TS F.8.a Surveillance Activities - Records of the testing activities required by the second sentence of TS F.8.a are now being maintained.

(Closed) Inspector Follow-up Item (77-02): Exemption of Reactor Supervisor from Participation in the Requalification Program - Due to NRR approved changes in the requalification program, the reactor supervisor must now perform the required reactivity control manipulations.

(Closed) Inspector Follow-up Item (77-02): Air Sample Data Sheet Calculation Incomplete - Those data sheets which contained incomplete calculations have been completed.

3. Review and Audit

The inspector reviewed the licensee's records relative to the Nuclear Reactor Committee membership and meetings, design changes, experiments and audits. The Nuclear Reactor Committee met quarterly as required during the review period on 9/14/77, 12/7/77, 3/21/78, 5/9/78 and 9/19/78. All were attended by the full membership of the committee. No recommendations relative to experiments were made during the minutes reviewed.

One audit of the facility was conducted on 7/28/78 and no significant modifications or design changes were made in the facility during the review period.

No items of noncompliance or deviations were identified.

4. Surveillance

During the review, the inspector examined parameters identified in the Technical Specifications as LCO, design criteria or LSSS which do not have established surveillance frequencies. Additionally, the inspector reviewed surveillance records for Technical Specification required items.

No items of noncompliance or deviations were identified.

5. Radiation Control

The inspector reviewed the facility's procedures, posting requirements, radiation area markings, personal monitoring devices, conducted a survey in conjunction with the University Radiation Safety Technician and reviewed the following records:

a. Air Sampling Data Sheets, 10/6/77 - 10/5/78

b. Water Sampling Data Sheets, 10/22/77 - 10/5/78

c. Radioactive Waste Burial Log, 5/2/77 - 10/5/78

d. Calibrations (Instruments), 6/19/77 - 10/5/78

e. Surveys, 9/30/77 - 10/5/78

f. Records of External Radiation Exposure

All recorded levels of radiation and exposures appeared to be within prescribed limits. However, it was noted that air sampling data sheets for the period 10/6/77 to 1/17/78 and water sampling data sheets for the period 12/15/77 to 6/18/78 were not available for review. Discussion with the licensee indicated that the samples had been taken but that the records had been discarded. Other records available did indicate that the samples had been taken. Additionally, a review of the calibration data sheets indicated that four instruments had not been calibrated within the past 22 months.

The foregoing was discussed with the licensee who indicated that appropriate steps would be taken to remedy the problems discussed above. This matter will remain as an unresolved item pending a review during the next inspection.

The inspector had no further questions in this area.

6. Reactor Organization, Logs and Records

The inspector determined that the organizational requirements for the Nuclear Reactor Facility are being met in accordance with applicable Technical Specifications. The inspector reviewed all entries of the operations log from October 14, 1977 to October 5, 1978, a portion of the charts from the Period Recorder and the Log Power Recorder, and the Startup Checklist from October 14, 1977 to October 5, 1978. The logs appear to be complete and the facility appears to have been operated within allowable Technical Specifications. Several unscheduled scrams were identified and the source of the problems were noted in the log. No major maintenance activity requiring action under Technical Specifications was performed during the period reviewed. The licensee's annual reported dated July 24, 1978 was also reviewed in conjunction with the above logs and records.

No items of noncompliance or deviations were identified in any of the above areas.

7. Research Reactor Experiments

The experiments performed during the period October 14, 1977 to October 5, 1978 involved only the irradiation of absorber materials such as Cobalt, Indium, Tantalum and Potassium Chloride in the beam ports of the reactor. The inspector reviewed each of the irradiations. Each had been reviewed and approved in accordance with the Technical Specifications. By discussion with the reactor operator, the inspector determined that each experiment was properly packaged, was properly loaded into and removed from the reactor and was handled with appropriate caution concerning radiation and contamination.

No items of noncompliance or deviations were identified.

8. Research Reactor Requalification Training

The inspector reviewed the following records:

a. Annual Evaluation of H.O. Woody Reactor Operator Performance, December 15, 1977.

b. Annual Evaluation of H.R. Rosson Reactor Operator Performance, December 15, 1977.

c. Reactor Operator Requalification Examination for H. O. Woody, December 16, 1977.

d. Reactor Manipulations Record for R. B. Mesler, December 21, 1977.

A review of the facility emergency procedures and changes to the operating license was conducted for all licensed individuals on September 15, 1977.

No items of noncompliance or deviations were identified.

9. Procedures

The inspector reviewed the procedural requirements as required by the Technical Specifications and determined that each of the following procedures had been reviewed and approved by the Nuclear Reactor Committee:

Safety Channel Check
Measurement of Rod Drop Time
Emergency Procedures
Reactor Operation and Maintenance
Requirement for Continuous Monitoring of Reactor Bay Air
Internal Transfer of Special Nuclear Materials
Complete or Partial Unloading and Subsequent Reloading of Core
Experiment Control
Area Monitor Calibration
Safety Channel Check
Visitor Exposure Monitoring
Changing Reactor Bay Air Filters

No items of noncompliance or deviations were identified.

10. Fuel Inspection

The inspector reviewed the records of the inspection of reactor fuel which had been completed 6/7 and 6/8/78. The fuel inspection report dated 6/12/78 indicated that the elements and control rods were in satisfactory condition. Rod Number 3 armature and magnet required removal of a relatively small "brown deposit."

During review of the records of removal and replacement of the fuel, the inspector noted that fuel element number 412 had been the first element removed from the core. This is contrary to the Nuclear Reactor Committee approved procedure, "Complete or Partial Unloading and Subsequent Reloading of Core." This procedure states in the unloading section that, "Fuel elements shall be removed from the core one at a time. The first element removed shall be the one to create a configuration of core loading number 1." To accomplish this (core loading number 1) element number 413 should have been removed from the square loading array first.

The inspector informed the licensee that failure to follow the approved procedure was considered an item of noncompliance since TS J.8 requires that all activities listed in TS J.3 be performed in accordance with approved written procedures.

Other aspects of the core unloading and reloading, i.e., 1/M plots, radiation monitoring, and check of the reactor instrumentation prior to restart appeared to be acceptable.

No other items of concern were identified and the inspector had no further questions in this area.

11. Environmental

An evaluation of the licensee's method of effluent monitoring was performed by the inspector; included were discharge paths and the effluents reported in the annual report.

No items of noncompliance or deviations were identified.

12. Emergency Plan

The inspector reviewed the facility's emergency planning and held discussions with key individuals who may be involved in an emergency. Fire and emergency alarms were last checked for operability on 7/28/78 by the University Facilities Operations and a drill is scheduled to be conducted in the near future. Since the specific date of the drill was not known at the time of the inspection, this will remain an open item.

12. 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. The following item was identified during the inspection.

7801-1 Calibration of Health Physics Instruments - paragraph 5

13. Exit Interview

An exit interview was held with representatives of the licensee on October 6, 1978 following completion of the inspection. At the interview, the inspector discussed the findings indicated in the previous paragraphs. The licensee acknowledged these findings.