

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

Report No. 50-148/79-02

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 22-24, 1979

Inspectors: Robert A. Spangler 11/5/79  
R. G. Spangler, Reactor Inspector Date

M. Jean Rucker 11/5/79  
M. J. Rucker, Reactor Inspector Aide Date

Reviewed By: G. L. Madsen 11/5/79  
G. L. Madsen, Chief, Reactor Operations and Date  
Nuclear Support Branch

Inspection Summary

Inspection on October 22-24, 1979 (Report No. 50-148/79-02)

Areas Inspected: Routine, unannounced inspection of organization, logs and records; review and audit; requalification training; surveillance; experiments; radiation control; follow-up on inspector identified problems; and follow-up on items of noncompliance. The inspection involved 36 inspector-hours on-site by two (2) NRC inspectors.

Results: Of the eight areas inspected, no items of noncompliance or deviations were found in seven areas; one apparent item of noncompliance was found during the review of logs and records (Infraction - failure to properly implement a design change (paragraph 3)).

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DETAILS1. Persons Contacted

B. Friesen, Radiation Safety Officer  
\*R. Mesler, Reactor Supervisor  
J. Price, Radiation Safety Technician  
\*H. Woody, Reactor Operator

\*Denotes those present during the exit interview.

2. Inspector Follow-up

(Closed) Item of Noncompliance (Inspection Report No. 78-01, paragraph 10):  
Use of a Superseded Procedure During the 1978 Fuel Inspection.

The inspector verified that the licensee conducted a review of procedure files and that all superseded procedure copies were removed or clearly identified.

(Closed) Unresolved Item 7801-1 (Inspection Report No. 78-01, paragraph 5):  
Failure to Complete Air and Water Sample Data Sheets and to Perform  
Timely Instrument Calibrations.

The inspector's review of activities in the area of radiation control (see paragraph 8 of this report) indicates that the licensee is now completing all sample data sheets and has calibrated all radiation instrumentation this year.

3. Organization, Logs and Records

The inspector reviewed the facility operations log and associated startup checksheets for the period December 12, 1978 to October 11, 1979 and the annual report dated July 16, 1979. The logs and the annual report appear to be complete and to represent an accurate history of the facility's operation. It also appears that the Technical Specification requirements addressing the facility organization are being met. During this review the inspector found that the reactor had been started on October 9 and 11, 1979, with an EG&G Ortic linear amplifier used in place of the original linear amplifier unit in the startup reactor instrumentation circuit. Further review indicated the following:

- (a) The Nuclear Reactor Committee had not reviewed this modification.
- (b) There was no approved calibration procedure available.
- (c) There was no record that the linear amplifier had been calibrated prior to reactor startup.

- (d) There was no startup test procedure utilized for the test and checkout of the modified startup circuit.

Items (c) and (d) above preclude the licensee from demonstrating full compliance with Technical Specification F.7 which requires the safety interlocks listed in Table II of the Technical Specifications to be operable. From discussions with the Reactor Operator and Reactor Supervisor it does appear that the linear amplifier was in calibration and that appropriate precautions were exercised during the October 9 and 11 reactor startups although these were not documented. However, Technical Specification J.2 states:

"2. The Nuclear Reactor Committee shall be responsible for the review of:

- "a. Operation of the nuclear reactor.
- "b. Conformity of operations with the Technical Specifications.
- "c. Unusual incidents and occurrences.
- "d. Any additions, modifications, or maintenance to the core and its associated support structure, the pool coolant system, the rod drive mechanism, or the reactor safety system to determine that they are made and tested in accordance with the specifications to which the systems were originally designed and fabricated, or to specifications approved by the Nuclear Reactor Committee.
- "e. Changes in the facility or procedures to determine if they constitute (1) unreviewed safety questions and/or changes in Technical Specifications, and therefore require license amendment prior to implementation, or are (2) previously authorized within the boundaries of the existing license and technical specification and therefore do not require further action prior to execution, and/or are (3) reportable under paragraph 50.59 of 10 CFR 50."

The failure of the Nuclear Review Committee to conduct the reviews required by (d) and (e) above for this system modification constitutes an item of noncompliance at the infraction level.

#### 4. Review and Audit

The inspector examined the Nuclear Review Committee minutes for December 4, 1978, March 20, 1979, May 8, 1979 and September 19, 1979 and the facility annual audit conducted on July 5, 1979. It appears that the Nuclear Review Committee met quarterly with a quorum present as

required by the Technical Specifications. Several minor problems were identified on the annual audit and resolved by the Nuclear Review Committee during their review of the audit results.

No items of noncompliance or deviations were identified.

5. Surveillance

The inspector verified that all surveillance activities were conducted at the required frequency and provided acceptable results. All Technical Specification design criteria, limiting conditions for operation, and limiting safety system settings appear to have been met. The following procedures were selected for technical review:

- (a) Rod Drop Times
- (b) Cobalt-60 Standard Irradiations
- (c) Safety Channel Test
- (d) Safety Amplifier Test

No items of noncompliance or deviations were found.

6. Experiments

The inspector reviewed the Irradiation Record and Order Forms from September 14, 1978 to September 20, 1979. The irradiations documented on these forms were the only experimental activities conducted at the facility and they consisted of only neutron absorber materials. Each irradiation was reviewed and approved according to the facility's Experiments Procedure. The inspectors discussed the packaging and handling precautions used for these irradiations with the reactor operator who conducted them.

No adverse findings were identified.

7. Research Reactor Requalification Training

The inspector reviewed the Requalification Record for 1978 and found:  
(1) Annual Evaluation Reactor Operator Performance for individuals H. R. Rosson and H. O. Woody had been performed on December 26, 1978; and  
(2) the Annual Review of Emergency Procedures and Changes to the operating license was conducted for these individuals on September 18, 1978.

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The inspector noted that written examinations were due prior to the end of 1979, and one Senior Reactor Operator, H. R. Rosson, appears to have been inactive for longer than a four month period.

No items of noncompliance or deviations were identified.

8. Radiation Control

The inspector reviewed the facility's procedures, posting requirements, radiation area markings, personal monitoring devices, conducted an area survey, and reviewed the following records from October 9, 1978 to October 12, 1979:

- a. Air Sampling Data Sheets
- b. Water Sampling Data Sheets
- c. Radioactive Waste Burial Log
- d. Calibrations (Instruments)
- e. Area Surveys
- f. Records of External Radiation Exposure

All recorded levels of radiation and exposures appeared to be within prescribed limits. The sample data sheets were completed and instrument calibrations had been performed during this year. The inspector suggested to the Radiation Safety Officer and to the Reactor Supervisor that a visitor sign-in log be maintained for the reactor facility and that they should require at least once or twice a year that the area radiation survey be conducted with the reactor at 250kW.

No additional items were identified.

9. Exit Interview

An exit interview was held with representatives of the licensee on October 24, 1979, at the conclusion of this inspection. The inspectors discussed the findings noted in the previous paragraphs and they were acknowledged by the licensee representatives.

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