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

REGION V

Report No. 50-27/78-03

Docket No. 50-27 License No. R-76 Safeguards Group

Licensee: Washington State University

Pullman, Washington 99163

Facility Name: Nuclear Radiation Center

Inspection at: Pullman, Washington

Inspection Conducted: December 18-20, 1978

Inspectors: 1/9/79
G. W. Johnston, Reactor Inspector Date Signed

1/9/79
A. D. Johnson, Reactor Inspector Date Signed

Approved By: 1/9/79
B. H. Faulkenberry, Chief, Reactor Operations, Section #2, Reactor Operations and Nuclear Support Branch Date Signed

Summary:

Inspection on December 18-20, 1978 (Report No. 50-27/78-03)

Areas Inspected: Routine, unannounced inspection of organization, logs and records; review and audit; requalification training; procedures; surveillance; experiments; and miscellaneous independent inspection effort including a tour of the facility and observing daily check of safety and control instrumentation and assent to full power operation. This inspection involved 26 regular inspector hours by two NRC inspectors.

Results: No items of noncompliance or significant deviations were identified within the scope of the inspection.

DETAILS

1. Persons Contacted

*W. Wilson, Assistant Director, Nuclear Radiation Center
J. Neidgier, Reactor Technician
P. Privett, Student RO Trainee

*Present at exit interview.

2. Reactor Operations - General

The use of the facility continues to be for mass spectrometer research and irradiation of samples for activation analysis. The information in the Annual Report for the period July 1, 1977 to June 30, 1978, was found to be consistent with that obtained during this and the previous inspection in October 1977. The reactor supervisor T. A. Lovas has left WSU and has accepted another position with a utility. A new reactor supervisor will be on board January 1, 1979.

3. Organization, Logs and Records

Organization, logs and records pertaining to plant operations since October 1977 were examined by discussions with facility personnel and a selected review of the following:

Annual Report dated from July 1, 1977 to June 30, 1978
Reactor Log
Maintenance Log
Reactor Startup Checkoff
Irradiation Data Log
Preventive Maintenance Checklists
Power Calibration Log
Control Element Worth Log
Irradiation Request Forms
Core Change Log
Scram Summary
Pulsing Summary
Operator Requalification Record
Fuel Temperature Strip Chart (April, May 1978)
Linear Power Strip Chart (April, May 1978)

No items of noncompliance or deviations were identified.

4. Review and Audit

The licensee's review and audit program was examined by discussion with licensee management and a review of the Reactor Safeguards Committee Quarterly Audit Reports.

No items of noncompliance or deviations were identified.

5. Requalification Training

Discussions were h. d with licensee management and records of requalification training, including periodic and annual examinations, were examined to verify that the program was being implemented in accordance with the program approved by the NRC.

No items of noncompliance or deviations were identified.

6. Procedures

The inspectors reviewed the "Standard Operating Procedures (SOP)" of the licensee's facility for scope, technical adequacy, and conformance to the technical specifications. The inspectors discussed the procedures with the reactor staff and walked through the startup check list while it was being performed. All SOPs had been reviewed and approved by appropriate levels of management.

No items of noncompliance or deviations were identified.

7. Surveillance

The inspectors reviewed surveillance procedures and records of completed surveillance to verify adequacy and conformance to the technical specifications. The technical specification related parameters that were examined included; pulse reactivity, minimum reactor safety systems, control and safety rod drop times, core temperature, pulse rod drop time, excess reactivity, shut down margin, and power level calibration.

No items of noncompliance or deviations were identified.

8. Experiments

The inspectors examined greater than 20% of the experiments and irradiations conducted over the period from the previous inspection to this inspection. It was verified by examination of

records and discussion with facility personnel that all experiments and irradiations had been reviewed and approved in accordance with procedures and technical specification requirements. There were no special tests or new experiments carried out under 10 CFR 50.59 during this inspection period. The reactivity effect of experiments were predicted beforehand and confirmed by measurements. The limits, shutdown margin, excess reactivity, and individual and total worth of experiments were not exceeded.

No items of noncompliance or deviations were identified.

9. Shutdown Margin

During an examination of the operating characteristics of the reactor core, the inspectors observed that control blade No. 4 (the most reactive control blade) had a reactivity worth of $4.08. The facility technical specifications state that the facility must maintain a shutdown margin of $0.50 with the transient rod fully withdrawn. The transient rod had a reactivity worth of only $3.52. Currently, however, the reactor is loaded such that a shutdown margin in excess of $0.50 is maintained when the most reactive blade (control blade No. 4) is fully withdrawn. The inspectors' concerns were discussed with licensee management at the conclusion of the inspection (Paragraph 11). As a result of this discussion the licensee proffered to submit a change to the Technical Specifications. Other commitments were also made to assure an adequate margin of shutdown taking into account the reactivity worth of control blade No. 4.

10. Independent Inspection

The inspection included a tour of the facility, observation of the daily startup checks, and subsequent reactor startup and operation at full power. Also the inspector observed a semiannual power calibration surveillance test.

No items of noncompliance or unresolved items were identified.

11. Exit Interview

The inspectors met with the licensee representative (denoted in Paragraph 1) at the conclusion of the inspection. The scope and findings of the inspection were summarized. The licensee representative stated that a change to the technical specifications would be submitted to NRC to provide for using the most

reactive control element for the calculation of the shutdown margin. The submittal will be made along with a request for other proposed changes to the specifications. In addition, the licensee representative stated that excess reactivity additiions will be limited so as to assure a shutdown margin of $0.50 with the most reactive control element fully withdrawn. No further commitments were proffered by the representative since no items of noncompl ance or deviations had been identified by the inspector.