

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

REGION III

Report No. 50-155/79-16

Docket No. 50-155

License No. DPR-6

Licensee: Consumers Power Company  
212 West Michigan Avenue  
Jackson, MI 49201

Facility Name: Big Rock Point Nuclear Generating Plant

Inspection At: Big Rock Point Site, Charlevoix, Michigan

Inspection Conducted: November 13-16, 1979

Inspector: *E. T. Chow*  
E. T. Chow

12/6/79

Approved By: *W. S. Little*  
W. S. Little, Acting Chief  
Nuclear Support Section 1

12-6-79

Inspection Summary

Inspection on November 13-16, 1979 (Report No. 50-155/79-16)

Areas Inspected: Routine, unannounced inspection of shutdown margin determination; core power distribution limits; control rod scram time tests; control rod sequence and reactivity checks; reactivity anomaly determination; review of specification field change. The inspection involved 22 inspector hours onsite by one NRC inspector.

Results: Of all the areas inspected, no Items of Noncompliance or Deviations were identified.

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## DETAILS

### 1. Persons Contacted

C. J. Hartman, Plant Superintendent  
\*J. S. Rang, Operations and Maintenance Superintendent  
\*R. E. Schrader, Technical Superintendent  
\*D. P. Blanchard, Reactor Engineer  
\*T. C. Bordine, Quality Assurance Superintendent  
\*D. E. DeMoor, Technical Engineer  
\*R. B. DeWitt, Vice President of Nuclear Operations  
K. D. Brienzo, General Engineer

\*Denotes those present during the exit interview.

### 2. Verification of Conduct of Startup Physics Testing

The inspector reviewed the startup physics testing and verified that the licensee conducted the following:

- a. Control Rod Scram Time Tests
- b. Control Rod Sequence and Reactivity Checks
- c. Core Power Distribution Limits
- d. Core Thermal Power Evaluation
- e. Determination of Shutdown Margin
- f. Determination of Reactivity Anomalies

### 3. Shutdown Margin Determination

Big Rock Point Technical Specifications require that the shutdown margin with the most reactive control rod stuck out of the core be greater than 0.3% of reactivity.

The inspector examined information relating to shutdown margin determination as described in Procedure No. TR-43, Revision No. 7, "Shutdown Margin Check," dated October 20, 1979.

The inspector noted that the initial condition was that all control rods were fully inserted and two channels of fission chambers were placed in the core in addition to the two fixed excore channels. The measurements of the steady state neutron count rates were recorded for all four channels. Then a control rod was completely withdrawn, and another control rod in the vicinity was withdrawn a

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few notches which were equivalent to an insertion of reactivity greater than 0.3%, as determined by the computer code (GROK). The count rates of the four channels would increase and level off to new steady state values to verify that subcriticality was still maintained. The new steady state count rates of the four channels were recorded. Measurements continued until subcriticality of at least 0.3% reactivity was verified for every configuration with one rod full out and an adjacent rod partially out.

The inspector concluded that the Technical Specifications requirement on shutdown margin determination was met.

No items of noncompliance or deviations were identified.

4. Core Power Distribution Limits

The inspector reviewed information relating to surveillance of core power distribution limits which were calculated by the computer code (GROK). The inspector examined the GROK printouts obtained in November 1979. The inspector determined that all prerequisites were met, the computer was using input values from the actual plant conditions, all thermal margins satisfied Technical Specification requirements, and the calculated values by the computer were within the acceptable criteria established by the licensee.

No items of noncompliance or deviations were identified.

5. Control Rod Scram Time Tests

Big Rock Point Technical Specifications require that the control rod scram time be less than 2.5 seconds for 90% insertion of all control rods.

The inspector reviewed information relating to control rod scram time tests as described in Procedure No. TR-01, Revision No. 6, "Control Rod Drive Performance Test Procedure." The inspector examined the results of the test performed on October 30, 1979. The results indicated that the scram time of every rod was less than 2 seconds for full insertion.

The inspector concluded that control rod scram tests satisfied Technical Specification requirements.

No items of noncompliance or deviations were identified.

6. Control Rod Sequence and Reactivity Checks

The inspector reviewed information relating to control rod sequence and reactivity check as described in Procedure No. 16.3.2, Revision No. 1, "Critical Configuration Prediction".

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The acceptance criterion stated that the difference between the predicted and the actual critical configuration be less than 1% of reactivity.

The inspector reviewed information related to "Critical Approach and Period Report", dated October 22, 1979. The result indicated that actual criticality was achieved using the alternate control rod withdrawal sequence and the reactor was critical on Step 47. The difference between the predicted and the actual keff due to the difference between the predicted and the actual control rod configuration was about 0.2% of reactivity.

The inspector concluded that control rod sequence and reactivity checks were adequate.

No items of noncompliance or deviations were identified.

7. Reactivity Anomaly Determination

The inspector reviewed information relating to determination of reactivity anomaly. The Technical Specifications require that the reactivity anomaly be no greater than 1% of reactivity. The administrative limit of the reactivity anomaly was 0.6% of reactivity.

The inspector noted that the computer code (GROK) was used for calculations of keff. The inspector reviewed the printouts of GROK dated November 13, 1979. The results indicated that the discrepancy between the predicted and the actual keff was about 0.18% of reactivity.

The inspector concluded that the determination of reactivity anomaly satisfied Technical Specification requirements.

No items of noncompliance or deviations were identified.

8. Review of Specification Field Change

The inspector reviewed information relating to Specification Field Change SFC-79-036, "Removal of Temperature Compensation on Yarway Level Sensors." The inspector noted that temperature compensating jackets and heat clamps were removed from the Yarway level instrumentation and insulating shields were installed between the variable and the reference columns of the Yarway level instrumentation. This was done to remove temperature compensation effect on the reference columns due to heating from the variable columns. The inspector further noted that temperature measuring instruments were installed for monitoring the Yarway reference column water temperatures and the ambient air temperatures, and calibration was performed on the

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Yarway level instruments to account for the effect of the removal of temperature compensation.

The inspector noted that the Yarway level instruments were calibrated for 1350 psia, 582°F operation with the reference columns temperature of 250°F which was the sum of 200°F ambient temperature plus 50°F added temperature per Yarway's recommendation. The inspector noted that the average ambient temperature in the containment could exceed 230°F\* during LOCA and the effects of localized heating on the Yarway reference columns were unknown. The licensee stated that he would review the basis of using 250°F for the Yarway reference columns during a LOCA. This Unresolved Item (155/79-16-01) will be reviewed in a subsequent inspection.

\*Per conversation with K. D. Brienzo.

9. 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. An Unresolved Item disclosed during the inspection is discussed in Paragraph 8.

10. Exit Interview

The inspector met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on November 16, 1979. The inspector summarized the purpose and the scope of the inspection and the findings.

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