

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-155/87020(DRS)

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 Plant

Inspection At: Charlevoix, Michigan

Inspection Conducted: August 3-7, 1987

Inspector:

*B. A. Azab*  
B. A. Azab

*8/20/87*

Date

Approved By:

*Geoffrey C. Wright*  
Geoffrey C. Wright, Chief  
Test Programs Section

*8/20/87*

Date

Inspection Summary

Inspection on August 3-7, 1987 (Report No. 50-155/87020(DRS))

Areas Inspected: Routine, unannounced safety inspection of licensee action on previous inspection findings (92701), core power distribution limits (61702), determination of reactor shutdown margin (61707), and core thermal power evaluation (61706).

Results: Of the four areas inspected, no violations or deviations were identified.

## DETAILS

### 1. Persons Contacted

- \*T. W. Elward, Plant Manager
- \*C. R. Abel, Production and Performance Superintendent
- \*G. R. Boss, Reactor Engineer
- \*T. R. Fisher, Senior Quality Assurance Consultant

The inspector also interviewed other licensee employees including members of the technical and operating staff.

\*Denotes persons attending the exit meeting on August 7, 1987.

### 2. Licensee Action on Previous Inspection Findings (92701)

The inspector reviewed the incident previously identified in Inspection Report No. 87005(DRP); on April 10, 1987 the administrative limit for the power escalation rate was exceeded. The power escalation rate, caused by a positive reactivity addition from xenon (Xe) burnout, was determined to be 7.28 MWt/hr. Technical Specifications limit the rate of change of reactor power between 120 MWt and 200 MWt to 20 MWt/min. The Cycle 22 Technical Data Book limits the power escalation rate to 4.7 MWt/hr when operating above the threshold power for fuel preconditioning of 133.5 MWt. The maximum power during the xenon transient was determined to be 146 MWt.

The inspector noted that the fuel preconditioning threshold power of 133.5 MWt was conservative for the following reasons:

- The memo entitled "Final Power Escalation Rate Recommendations for Big Rock Point Cycle 22 Operations," lists exposure dependent threshold powers. By taking credit for fuel exposure, the threshold at the time of the incident was 146.5 MWt, therefore actual power never exceeded the threshold for limiting the power escalation rate to 4.7 MWt/hr.
- Discussions with the Reactor Engineer revealed that more conservatisms were incorporated into the calculation of the threshold power for Cycle 22 than in previous cycles. For example, Cycle 21 had a threshold power of approximately 188 MWt compared to 133.5 MWt for the current cycle.

Although the incident on April 10, 1987 did result in exceeding an administrative limit, the conservatism in the limit was such that no fuel limits were approached and the safety significance of the occurrence was minimal.

The inspector used the following documents during the review:

- Deviation Report, No. D-BRP-87-76.
- Engineering Analysis, No. EA-D-BRP-87-76.
- T1-09, "Heat Balance Calculation," Revision 9, performed April 10, 1987.
- Memo from JCHo to DP Hoffman titled: "Final Power Escalation Rate Recommendations for Big Rock Point Plant Cycle 22 Operations."

No violations or deviations were identified.

3. Core Power Distribution Limits (61702)

The inspector verified that the licensee operated within the power distribution limits detailed in Technical Specification 5.2.1., by a review of the following documents:

- BRP Cycle 22 Final Physics Package.
- Cycle 22 Core Follow Book No. 1.
- GROK-CZZP-312A-01, Computer Output.
- EA-GROK-CZZP-312A-01, Engineering Analysis Worksheet.

No violations or deviations were identified.

4. Determination of Reactor Shutdown Margin (61707)

The inspector reviewed the following documents concerning shutdown margin:

- a. TR-43, "Shutdown Margin Check," Revision 51, performed on February 27, 1987, was reviewed for proper methodology and compliance with Technical Specification 5.2.2(b).
- b. BRP Cycle 22, Final Physics Package calculations and analysis associated with shutdown margin and rod worths, were reviewed and it was verified that the methodology was technically adequate.

No violations or deviations were identified.

5. Core Thermal Power Evaluation (61706)

The inspector reviewed a one month sample of the completed procedure, T1-09, "Heat Balance Calculation," Revision 9 and verified that the procedure was performed at the recommended frequency of once per day. The inspector verified the technical adequacy of the procedure by independently performing a hand heat balance for August 3, 1987 and obtaining the same core thermal power as the licensee.



The inspector identified one concern during the review. The procedure required an adjustment of the picoammeters if the calculated core thermal power was greater than the picoammeter indicated power by more than three percent. A T1-09 performed on July 28, 1987 required a calibration of the picoammeters based on the above criterion; however, a calibration was not performed. Further review revealed that the licensee decided not to adjust the picoammeters because the heat balance had been performed immediately following rod pulls, and the Shift Supervisor recognized that the reactor was not at steady state conditions and therefore the heat balance result was inaccurate. It was noted in the comments section of the procedure that the heat balance was to be re-performed.

Procedures SOP-1, "Reactor Operation," Revision 141 and GOP-5, "Power Operation," Revision 138, provided instructions on when to perform heat balances; however, they do not specify steady state conditions. The Reactor Engineer agreed to revise the above procedures to provide better guidance for when to perform heat balances. The inspector has no further concerns in this area.

No violations or deviations were identified.

5. Exit Interview

The inspector met with the licensee representatives (denoted in Paragraph 1) on August 7, 1987. The inspector summarized the scope and findings of the inspection. The inspector also discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspector during the inspection. The licensee did not identify any such documents/processes as proprietary.