

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

REGION III

Report No. 50-346/77-24

Docket No. 50-346

License No. NPF-03

Licensee: Toledo Edison Company
Edison Plaza
300 Madison Avenue
Toledo, OH 43652

Facility Name: Davis-Besse Nuclear Power Station, Unit 1

Inspection at: Davis-Besse Site, Oak Harbor, OH

Inspection Conducted: August 8-12, 1977

Inspector: *JSC* J. S. Creswell

Approved by: W. S. Little, Chief
Nuclear Support Section

W. S. Little 8/29/77
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Inspection Summary

Inspection on August 8-12, 1977 (Report No. 50-346/77-24)

Areas Inspected: Initial criticality witnessing. The inspection involved 61 inspector-hours onsite by one NRC inspector.

Results: No items of noncompliance were identified.

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DETAILS

1. Persons Contacted

Principal Licensee Employees

*J. Evans, Station Superintendent
T. Murray, Assistant Station Superintendent
J. Lingenfelter, Nuclear and Performance Engineer
G. Rambo, Test Leader

The inspector also interviewed other licensee employees including members of the Operations and Technical staff.

*Due to time limitations the Plant Superintendent was contacted by telephone regarding the inspection findings.

2. Review of the Initial Criticality Procedure

The inspector reviewed the licensee's procedure for attaining criticality and found it was not entirely consistent with either of the two methods submitted in the FSAR. The licensee confirmed that initial criticality would be achieved by deboration as delineated by the FSAR. The licensee also agreed to stop and evaluate conditions which resulted in 1/m plot criticality predictions outside a $\pm 1\%$ ok band around the calculated estimated critical.

No items of noncompliance were identified.

3. Review of "Soluble Poison Concentration Control" Preoperational Test

The inspector reviewed the test results of the performance of TP 600.03, "Soluble Poison Concentration Control Test." During the test 644.55 gal. of 11,638 ppm boron solution were injected into the makeup tank in 14 minutes. At the beginning of the test the makeup tank contained demineralized water, a situation that could be encountered during actual dilution. Forty-three minutes after boric acid flow had been initiated the PCS concentration had only risen 16 ppm which is much less than expected by the inspector. NRR was contacted and they confirmed that the Technical Specification requirement for boration was met if ≥ 18 gpm of 7875 ppm boron could be delivered to the makeup tank.

No items of noncompliance were identified.

4. Observation of Reactor Protection System Monthly Functional Test

Observation of this test revealed that the licensee had extreme difficulty in meeting the tolerance on voltages specified in the procedure. Numerous temporary changes were made to relax these tolerances which at some points were as restrictive as 0.5 mv.

A procedural inaccuracy was noted in that a "difference" amplifier was described in lieu of a "scaled difference" amplifier. The scaled difference amplifier had apparently been installed since the procedure was originally written and the procedure author had not modified the procedure accordingly. The procedure had been reviewed by the Safety Review Committee.

No items of noncompliance were identified.

5. Initial Criticality Witnessing

The inspector reviewed Technical Specifications which applied to performance of criticality. No items of noncompliance were identified in this area.

While the prerequisites for performing the test were being checked and before permission to proceed with the test was given, the operator gave orders to close the control rod trip breakers. The inspector informed the licensee that the step requiring that action had not been reached. The licensee then opened the breakers and performed the test in the proper sequence.

During withdrawal of the control rods, several problems were encountered with the position indication system. These problems were due to loose connections in the circuitry and the licensee repaired the connections prior to continuing withdrawal. The approach to critical proceeded in an orderly fashion until at 5:30 PM EDT August 12, the reactor became critical at a Boron concentration of approximately 1528 PPM.

6. Exit Interview

The inspector telephoned the Plant Superintendent on August 22, 1977 and discussed the findings of the inspection. The following items were discussed:

- a. The performance of the reactor protection system surveillance.
- b. The maximum boration system.

The licensee agreed to review the subject RPS surveillance procedure to determine that all temporary changes made were correct and that voltage tolerances were appropriate.

During the discussion of the "Soluble Poison Concentration Control" preoperational test (Paragraph 3) the licensee stated that, based upon their experience during the zero power physics tests, the reactivity response to reactor boration indicated a much quicker change in boron concentration than indicated by the preoperational test. The inspector stated that the licensee should attempt to correlate reactivity changes with changing boron concentration to determine what the maximum boration rate was. The licensee concurred.