

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

REGION III

Report No. 50-305/78-15

Docket No. 50-305

License No. DPR-43

Licensee: Wisconsin Public Service Corporation
Post Office Box 1200
Green Bay, WI 54305

Facility Name: Kewaunee Nuclear Power Plant

Inspection At: Kewaunee Site, Kewaunee, WI

Inspection Conducted: August 7-11, 1978

Inspectors: *MC Charles*
N. C. Choules

9/5/78

J. E. Kohler
J. E. Kohler

9/11/78

Approved By: *RFWarnick*
R. F. Warnick, Chief
Reactor Projects Section 2

9/5/78

Inspection Summary

Inspection on August 7-11, 1978 (Report No. 50-305/78-15)

Areas Inspected: Routine, announced inspection of plant operations, refueling startup testing, review of plant operation after refueling, nonroutine event followup, IE Bulletin and Circular followup, safety injection reset procedures, and independent inspection. The inspection involved 51 inspector-hours onsite by two NRC inspectors.

Results: No items of noncompliance or deviations were identified.

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DETAILS

Persons Contacted

Site

C. R. Luoma, (1)(2) Plant Superintendent
C. R. Steinhardt, (1) Assistant Superintendent, Operations
J. S. Richmond, (1) Technical Supervisor
D. M. McSwain, Instrument Control Engineer
A. J. Ruege, Plant Performance Engineer
K. H. Evers, (2) Reactor Supervisor
G. Ruiter, (1) Nuclear Systems Engineer
J. W. Tills, Maintenance Engineer

The inspector also talked with and interviewed members of the Operations, Instrument and Control, and Maintenance Sections.

Corporate Office

C. W. Geisler, (3) Superintendent, Nuclear Power
G. A. Spiering, (3) Quality Assurance Supervisor
R. A. Soboe, (3) Manager, Fuel and Fossil Operation
M. C. Marchi, (3) Nuclear Systems Engineer
E. D. Novack, (3) Director, Field Services
D. C. Hintz, (3) Nuclear Services Supervisor

- (1) Denotes those present at the exit interview at the site on August 11, 1978.
(2) Denotes those present at the exit interview at the site on August 9, 1978.
(3) Denotes those present at the exit interview at the corporate office on August 9, 1978.

Section I

Prepared by N. C. Choules

Reviewed by R. F. Warnick, Chief
Reactor Projects Section 2

1. Licensee Action on Previous Inspection Findings

(Closed) Unresolved Item (IE Inspection Report No. 50-305/77-10)
Operation of the auxiliary feedwater with the redundant feedwater header cross connect valves normally open. The licensee has reviewed the above and contacted Westinghouse concerning this operation. Westinghouse has concluded after rereview of this operation that the plant should still be operated with the cross connect valves open.

2. Plant Operations

a. Plant Tour

- (1) The inspector performed a plant tour accompanied by a licensee representative. The housekeeping in the plant was good.
- (2) During the tour, selected "hold" and "danger" tags were reviewed for proper approval and the status log was reviewed to determine if the tags were properly accounted for. No discrepancies were noted.
- (3) Selected valves in the emergency diesel generator cooling system were checked for proper alignment and no discrepancies were noted.

b. The jumper bypass log was reviewed and no discrepancies were noted.

c. Logbooks - The inspector reviewed the log sheets of the control room log and the Shift Supervisors logs for selected days for the past two and a half months and confirmed that entries were filled out to identify the action, and the Operations Supervisor is reviewing and initialing the log sheets indicating his review.

d. Night orders and temporary orders - The current subject orders were reviewed and no discrepancies were noted.

- e. Incident Reports (IR's) - The inspector reviewed IR's 77-36 through 78-50. No items of concern were identified.

3. Reportable Occurrences

The following reportable occurrences were reviewed by examination of logs and records and through discussions with plant personnel. Occurrences were reviewed for completion of reporting requirements, investigation and determination of cause, proposed corrective measures, and completion of corrective actions.

- a. RO 50-305/78-14^{1/} - Shield building ventilation train failed to draw a vacuum.
- b. RO 50-305/78-15^{2/} - RHR vent valve open violating containment integrity. This event was identified and corrected by the licensee.
- c. RO 50-305/78-17^{3/} - Steam flow transmitter out of calibration.
- d. RO 50-305/78-18^{4/} - Pressurizer level transmitter out of calibration.
- e. RO 50-305/78-19^{5/} - Reactor coolant flow transmitters out of calibration.
- f. RO 50-305/78-20^{6/} - Main steam line snubber found inoperable.
- g. RO 50-305/78-21^{7/} - Shield building ventilation train failed to draw a vacuum.
- h. RO 50-305/78-22^{8/} - Pressurizer level transmitter out of calibration.
- i. RO 50-305/78-23^{9/} - Main steam line snubber found inoperable.
- j. RO 50-305/78-24^{10/} - Supply breaker for MCC 1-62F tripped open three times. As indicated in the licensee's report, the cause of these breaker trips has not been identified. The licensee has performed extensive system checking and is monitoring the currents to the breaker.

- 1/ LER 50-305/78-14, WPS to RIII, dtd 5/19/78.
- 2/ LER 50-305/78-15, WPS to RIII, dtd 5/23/78.
- 3/ LER 50-305/78-17, WPS to RIII, dtd 5/31/78.
- 4/ LER 50-305/78-18, WPS to RIII, dtd 5/31/78.
- 5/ LER 50-305/78-19, WPS to RIII, dtd 6/9/78.
- 6/ LER 50-305/78-20, WPS to RIII, dtd 6/14/78.
- 7/ LER 50-305/78-21, WPS to RIII, dtd 6/21/78.
- 8/ LER 50-305/78-22, WPS to RIII, dtd 6/30/78.
- 9/ LER 50-305/78-23, WPS to RIII, dtd 6/30/78.
- 10/ LER 50-305/78-24, WPS to RIII, dtd 7/7/78.

- k. RO 50-305/78-25^{11/} - Containment air radiation monitor out of service for 39 hours. For this event a valve was left closed and sampling of containment air was not possible. At the same time the cover gasket on the monitor leaked which negated the low flow alarm which would have informed the control room that the valve was shut. The licensee identified these items and corrected them. The inspector suggested that a low flow check of the monitor should be made periodically to check that the gasket is not leaking. The licensee stated they would review this suggestion.
- l. RO 50-305/78-26^{12/} - Load adjustment for 1A diesel generator could not be adjusted from the control room.
- m. RO 50-305/78-27^{13/} - Steam pressure bistable instrument drift caused less conservative trip than required by Technical Specifications.

Review of these occurrences indicate the licensee's corrective actions appear to be adequate.

4. IE Bulletin and Circular Followup

a. IEB 78-05 and 78-06

As stated in the licensee's responses^{14/15/} to these bulletins, they do not have any electrical breakers and relays mentioned in the bulletins and therefore, the bulletins are not applicable to the licensee.

b. IEC 78-02

The licensee reviewed the recommendations of this circular and determined that lubricating oil used at Kewaunee is equivalent to the equipment manufacturer's recommendation.

c. IEC 78-04

The licensee has determined that they do not have the fire doors referenced in the circular.

d. IEC 78-05

The licensee had not experienced safety injection during cool-down as described in the circular, and has concluded that the

- ^{11/} LER 50-305/78-25, WPS to RIII, dtd 7/19/78.
- ^{12/} LER 50-305/78-26, WPS to RIII, dtd 7/21/78.
- ^{13/} LER 50-305/78-27, WPS to RIII, dtd 7/21/78.
- ^{14/} Ltr, WPS to RIII, dtd 5/1/78.
- ^{15/} Ltr, WPS to RIII, dtd 7/13/78.

circular is not applicable since Kewaunee is a two-loop plant, not a four-loop plant as described in the circular.

e. IEC 78-06

The licensee review of common mode flooding indicates they do not have this potential.

f. IEC 78-07

Kewaunee does not have a Bergan-Patterson 25000 hydraulic test stand. The licensee's evaluation of the test stand they do have indicates the same problem referenced in the circular would not occur to their test stand.

g. IEC 78-09

The licensee does not have any of the contactors referenced in the circular.

h. IEC 78-13

The licensee inspects intake bays to the service water pumps annually and has not observed a build up of sand as discussed in the circular.

5. Safety Injection (SI) Reset Procedures

The inspector reviewed the licensee's emergency operating procedures to determine if they contain instructions regarding required operator actions if a loss of offsite power or an accident occurs after the SI has been reset and before the engineered safety feature equipment is returned to the automatic starting sequence mode. Also, procedures were reviewed to see that they prevent the operator from moving any equipment out of the emergency mode prior to reset. The following emergency procedures were reviewed.

E-0-07, Safety Injection Activation
E-0-08, Steam Line Rupture
E-0-09, Steam Generator Tube Rupture
E-0-10, Loss of Reactor Coolant

These procedures contain the instructions above except that the licensee is revising E-0-07 to include instructions for the operator to reset the reactor trip breaker following reset of the SI to return the system to the automatic sequence mode when the SI is spurious.

6. Other Inspection Items

a. Lost Part-Evaluation

In a previous inspection^{16/} the licensee agreed to perform an evaluation on a small acorn nut which fell into the reactor vessel to assure that the nut would not block any core flow paths. The licensee has performed an evaluation and concluded the flow effects are negligible.

b. Temporary Changes to Procedures

The licensee has revised ACD 8.6 and is in the process of revising ACD 8.2 to include instructions for making temporary changes to procedures as the licensee previously committed to do.^{17/}

c. Electrical Penetrations Qualification

In a previous inspection^{18/} the licensee was unable to provide documentation that a containment penetration was tested with chemical spray. The licensee's Architect/Engineer (A/E) reviewed this and found that the chemical spray test was not performed. The A/E and the penetration manufacture have evaluated the corrosion effects of the chemical spray upon the penetrations and have concluded that no deleterious effects would be experienced during the relatively short duration of exposure to this type solution during an accident. This evaluation is documented in a letter to the licensee from Fluor Pioneer, Inc. dated June 20, 1978. This item is considered closed.

d. Changes to Design Change Packages

The licensee has revised ECD 4.1, Design Change Control, to include instructions for making changes to a design change after it has been issued for implementation.^{19/} This item was discussed during a previous inspection.

^{16/} IE Inspection Report No. 50-305/78-12.

^{17/} IE Inspection Report No. 50-305/78-01.

^{18/} IE Inspection Report No. 50-305/77-18. "

^{19/} IE Inspection Report No. 50-305/77-18.

Section II

Prepared by J. E. Kohler

Reviewed by J. F. Streeter, Chief
Nuclear Support Section 1

1. Moderator Temperature Coefficient

The inspector reviewed the results of the testing performed to determine moderator temperature coefficient. The results of the experiment showed that the moderator temperature coefficient was negative and in approximate agreement with predicted values supplied by the fuel manufacturer. The measurement showed linearity. The inspector has no further questions regarding this item.

2. Control Rod Worth Measurement

The inspector reviewed the results of measurements performed to determine control rod worth. The procedure called for the worth to be determined by the rod swap technique.

A large disagreement between Westinghouse and licensee predictions of control rod worth was identified during low power physics testing performed prior to full power operation. The disagreement in calculations made the amount of shutdown margin available at end of life (EOL) uncertain.

The licensee, Westinghouse, and NRR investigated the cause of the disagreement and determined it to be a calculational error on the part of Westinghouse. At the present time, the licensee and NRR are in agreement that control rod worth for Cycle 4 was measured with sufficient accuracy to assure minimum shutdown margin EOL.

3. Rod Swap Technique

The rod swap technique is under review by NRR. Based on the latest information available, NRR may determine the rod swap technique to be unacceptable for substitution of control rod worth measurements made by boron dilution. This item will be reviewed during a subsequent inspection.

4. Shutdown Margin

The licensee does not perform a specific shutdown margin physics test. Results of control rod worth measurements and calculations

are used to calculate shutdown margin. The control rod worth experiments and the shutdown margin EOL for Cycle 4 have been reviewed by NRR and found to be acceptable. The inspector has no further questions regarding this item.

5. Incore/Excore Calibration

The inspector reviewed the procedures used to calibrate the excore instrumentation to assure that excore measurements of axial offset is in agreement with incore measurements. The inspector determined that the calibration was performed for Cycle 4 and has no further questions regarding this item.

6. Power Distribution

The inspector reviewed the full core maps taken at 72% power. The review indicated that all thermal margins were within technical specifications requirements, all prerequisites were met, input values into the incore computer analysis data were taken from actual plant conditions at the time of instrumentation, and predicted values calculated by the computer code were within the allowable acceptance criteria established by the licensee. The inspector has no further questions regarding the incore power distribution maps.

7. Axial Flux

The inspector reviewed the licensee's determination of target axial flux and axial flux difference. The diagram for determining compliance with axial flux difference was available in the control room for operator use. The inspector has no further questions regarding this item.

8. Quadrant Power Tilt Measurements

The inspector reviewed several months worth of quadrant power tilt measurements for the present cycle. No tilt in excess of technical specifications was identified during power operation. There was no indication of the incore/excore tilt phenomenon identified in a previous inspection report. The inspector has no further questions regarding this item.

9. Review of Plant Operations After Refueling

The inspector reviewed the startup package completed by the operations department prior to startup of Cycle 4. This package demonstrated that various plant systems described during the refueling outage were aligned according to approved procedures for startup. The inspector has no further questions regarding this item.

10. Audit of Fuel Management Group

The inspectors met with the Fuel Management Group (FMG) at the corporate headquarters in order to determine the progress that has been made in procedure preparation and implementation. Lack of FMG procedures was an area noted in an internal consultant's report to the licensee and reported to the NRC.^{20/} The inspectors found that significant progress has been made in procedure preparation and implementation. However, the entire program is not yet fully implemented.

Attention was directed towards the manner in which changes to FMG computer codes are made. The inspectors found that changes to computer codes were performed in a controlled manner with the use of a procedure change form.

Fuel Management Group procedures implementation will be followed up in a future inspection.

11. PORC Review of FMG Procedures

The Plant Operations Review Committee (PORC) has the responsibility to review all procedures which are safety related and which may have an effect on the safe operation of the plant. A Nuclear Safety Review and Audit Committee audit report for January 1978 states that the PORC must decide which FMG procedures require review. To do this, the PORC has formed a subcommittee at the site to determine which FMG procedures require PORC review.

FMG procedures and activities receive a detailed review and audit from Nuclear Associates International (NAI) and an audit report is generated. If the licensee determines that he must review the FMG procedures to comply with the technical specifications, it would be permissible for the PORC to use NAI as its consultant. The NAI audit report of FMG procedures could then be submitted to PORC for review. PORC review of NAI or findings for the FMG would meet the requirements of PORC review of FMG procedures. This item will be reviewed in a future inspection.

12. Open Items Identified in Inspection Report 50-305/77-10

- a. Inconsistency in procedure SP004. The inspector determined that procedure SP004 was modified so that achieving a positive ΔI is now optional. This item is closed.
- b. Use of incore/excore ratio of 1.7. The licensee supported the argument that use of 1.7 for the calibration of delta
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20/ Ltr, WPS to RIII, dtd 10/21/77.

flux comparators was conservative when the actual ratios ranged from 1.603 to 1.642. This item is closed.

- c. Quadrant Power Tilt: No tilts have been observed for Cycles 3 or 4. Westinghouse made recommendations regarding the procedure for tilt measurement. This item is closed.
- d. Shutdown Margin Determination. This item is closed (Paragraph 4)

Exit Interviews

The inspectors (Choules and Kohler) met with the licensee representative (denoted in Persons Contacted paragraph) at the plant site on August 9, 1978. The inspectors also met with the other licensee representatives (denoted in Persons Contacted paragraph) at the corporate office on August 9, 1978. Mr. Choules met with the licensee representative (denoted in Persons Contacted paragraph) at the conclusion of the inspection at the plant site on August 11, 1978. The inspectors summarized the scope and findings of the inspection.

Inspection items in Section II, paragraphs 10 and 11 were discussed in detail.