U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-315/86028(DRS); 50-316/86028(DRS)

Docket Nos. 50-315; 50-316 Licenses No. DPR-58; DPR-74

Licensee: American Electric Power Service Corporation
Indiana and Michigan Power Company
1 Riverside Plaza
Columbus, Ohio, 43216

Facility Name: D. C. Cook Nuclear Plant, Units 1 and 2

Inspection At: D. C. Cook Site, Bridgman, Michigan

Inspection Conducted: July 28 through August 14, 1986

Inspectors: P. R. Rescheske — Date: Aug 28, 1986

B. A. Azab — Date: 8/28/86

Approved By: M. A. Ring, Chief
Test Programs Section — Date: 8/28/86

Inspection Summary

Inspection on July 28 through August 14, 1986 (Reports No. 50-315/86028(DRS); No. 50-316/86028(DRS))
Areas Inspected: Routine, unannounced, safety inspection of core power distribution limits, core thermal power evaluation, isothermal and moderator temperature coefficient measurement, rod drop time testing, initial criticality, and the startup test procedure.
Results: No violations or deviations were identified.

DETAILS

1. Persons Contacted

*A. A. Blind, Assistant Plant Manager
*R. W. Hennen, Supervisor, Nuclear Engineering
*D. L. Gallagher, Administrative Compliance Coordinator, Quality Control
*T. A. Kriesel, Technical Superintendent, Physical Sciences
*T. K. Postlewait, Superintendent, Technical Engineering
*M. M. Terry, Administrative Compliance Coordinator, Quality Control
*R. Russell, Administrative Compliance Coordinator, Planning/I&C

The inspectors also interviewed other personnel during the course of the inspection including members of the licensee's technical, operating, and radiation protection staff.

*Denotes persons attending the exit meeting on August 14, 1986.

2. Core Power Distribution Limits

The inspectors reviewed portions of the Unit 2, Cycle 6, surveillance and test procedures, test results, and flux maps used by the licensee to satisfy the power distribution requirements of the Technical Specifications (Section 3/4.2). The following procedures and records were used during this review:

a. Procedure No. 12 THP 6040 PER.323, Revision 2, "Flux Map and Thermocouple Map Data Collection."

b. Procedure No. **12 THP 4030 STP.342, Revision 9, "Axial Flux Difference Monitor Channel Check."

c. Procedure No. **2 THP 4030 STP.330, Revision 9, "Surveillance of Core Power Distribution Limits."

d. Flux maps and the applicable data sheets from the above procedures performed on July 12, 1986, at about 29% RTP (reactor thermal power); July 14 at 46.6% RTP; July 15 at 46.9% RTP, 47% RTP, and 46.5% RTP; July 21 at about 68% RTP; and on July 24, 1986 at about 90% RTP.

e. Daily Trend Block for Unit 2, Cycle 6.

f. Procedure No. 2-OHP 4030.STP.030, Revision 12, "Daily and Shift Surveillance Checks," Data/Signoff Sheet 6.3, Item No. 22, "Axial Flux Difference (%)," and the shiftly surveillances performed on July 24 through August 6, 1986.

g. Procedure No. 2-OHP 4030.STP.032, Revision 2, "Quadrant Power Tilt Ratio Calculation," and the surveillances performed on July 26 and August 2, 1986.

Based on this initial review, the inspectors had no concerns. Further inspection will be performed during a subsequent NRC inspection.

No violations or deviations were identified.

3. Core Thermal Power Evaluation

a. The inspectors reviewed the licensee's surveillance Procedure No. 2-OHP 4030.STP.029, Revision 6, "Reactor Thermal Power Determination," and the results from the Unit 2 tests performed during July 11 (beginning of Cycle 6) through July 28, 1986, (80% RTP). The licensee uses this "short form" thermal power determination to satisfy Technical Specification 3/4.3.1, which requires a calculation to be performed every 24 hours above 15% RTP, and the excore detectors to agree within 2% or be adjusted (administrative limit is 1%). The plant computer P-250 thermal power program is the normal method used; a manual calculation using feedwater flows and temperatures is available as a backup method. On July 29, 1986, the inspectors performed an independent heat balance calculation using the licensee's methods and actual plant data, and verified that thermal power was about 80% RTP. The licensee's calculations and methods were further verified by running a NRC Fortran program using plant data and approximate design parameters. The review of the licensee's procedure and completed records indicated that the surveillance requirements were satisfied, and that the test results were properly calculated, recorded, and approved.

b. The inspectors reviewed the thermal power test portion of the licensee Procedure No. **12 THP 4030 STP.219, Revision 4, "Thermal Power Measurement and Reactor Coolant System Flow Rate," and the data from the testing performed on July 14 (47% RTP), July 21 (68% RTP), and July 24, 1986 (90% RTP). By the close of this inspection period, the licensee had not as yet completed the procedure. Test data transferred from computer printouts, calculations, and review signatures are required to complete the test records. Based on this initial review, the inspectors had no concerns. Further inspection will be performed during a subsequent NRC inspection.

No violations or deviations were identified.

4. Isothermal and Moderator Temperature Coefficient Measurement

a. The inspectors reviewed the licensee's startup test Procedure No. **12 THP 6040 PER.350, Revision 3, "Isothermal Temperature Coefficient (ITC) Measurement and Moderator Temperature Coefficient (MTC) Calculation," and the test results obtained for Unit 2 on July 8, 1986. The licensee uses this procedure after the reactor is critical to measure the ITC, and to calculate and determine that the MTC is within the Technical Specification requirements 3/4.1.1.4. The inspectors reviewed the completed test records, the X-Y plotter graphs, the reactivity

computer strip charts, and the vendor supplied data. This review indicated that the acceptance criteria was met (MTC < 5 pcm/°F, averaged over three heatups and three cooldowns), and that the records were properly reviewed and approved.

b. The inspectors reviewed the licensee's surveillance test Procedure No. **12 THP 4030 STP.307, Revision 10, "Moderator Temperature Coefficient Determination," the test data, the reactivity computer strip charts, and the daily trend block. The licensee uses this surveillance test during the fuel cycle to ensure that the MTC is within the Technical Specification limits. A review of the completed Unit 2 test performed on July 22, 1986, at about 68% reactor power, indicated that the MTC requirements were satisfied, and that the test results were properly reviewed and approved.

No violations or deviations were identified.

5. Rod Drop Time Testing

The inspectors reviewed the licensee's surveillance test Procedure No. **2 THP 4030 STP.387, Revision 1, "Rod Drop Measurements," and the results of the testing for Unit 2 performed on June 25, 1986. This test was used to satisfy the surveillance requirements of Technical Specification 3/4.1.3.4, subsequent to the refueling outage. The inspectors reviewed the test data and the rod drop timing traces, and verified that the rod drop times from the fully withdrawn position were less than the administrative limit of 2.08 seconds. A review of the completed records indicated that the test was properly performed, and that the test results were reviewed and approved.

No violations or deviations were identified.

6. Initial Critically

The inspectors reviewed the licensee's Unit 2 startup Procedure No. **12 THP 6040 PER.357, Revision 5, "Initial Criticality, All Rods Out Boron Concentration and Nuclear Heating Level," and the data recorded during the approach to critical on July 7, 1986. Data recorded included: source range baseline count rates, bank positions versus source range counts, boron concentrations versus count rates, subcritical flux range detector currents, boron endpoint data, and source/intermediate range detector overlap data. The inspectors reveiwed the completed records, the reactivity computer strip charts, and vendor supplied data. This review indicated that the administrative requirements and the applicable Technical Specifications were satisfied, and that the test was properly performed, reviewed, and approved.

No violations or deviations were identified.

7. Startup Test Procedure

a. Unit 1, Cycle 9

Procedure No. **12 THP 6040 PER.359, Revision 3, "Zero Power and Power Ascension Tests," was used by the licensee to satisfy the startup testing requirements for the new fuel cycle (Cycle 9) subsequent to the Unit 1 reactor being critical. The objectives of this procedure include: to provide guidance to the different plant departments to ensure data is obtained and surveillance procedures are performed as required, to verify design physics parameters, and to ensure that the required Technical Specifications are satisfied. The startup testing was signed off as completed prior to January 1986, with the exception of Step 9.2.15.3, which required a plant radiation survey to be performed. As of August 6, 1986, this step had not been signed off, therefore, the final review and acceptance of the startup testing also had not been signed off (Step 11.1). A signature in Step 11.1 indicates that the results of the startup testing program have been completed and reviewed, and that the results are acceptable for continued operation. The inspectors discussed the issue of timeliness with the Nuclear Engineering and Radiation Protection (R/P) Groups. Through these discussions and the review of previous startup records, the inspectors obtained the following information:

(1) The Nuclear Group had informed the R/P Group that a survey was required after reaching 90% RTP in January 1986. The responsible R/P personnel were not aware of the requirement until April 1986.

(2) The inspectors noted that for Unit 2, Cycles 3, 4, and 5, this requirement had been signed off within five weeks of the completion of the startup testing.

(3) In April 1986, the R/P Group had begun to draft a procedure to satisfy the survey requirement. On May 8 and 9, 1986, some of the draft data sheets had been completed. Subsequently, the Unit was shutdown for a period of time and no further surveys were performed.

(4) Neither the Nuclear or R/P Groups could define a "plant radiation survey." The basis for the requirement and the extent of the survey was not known. According to the licensee, the confusion that existed was due in part to staffing changes. The knowledgeable personnel were no longer available. The basis for the requirement appears to have originated in the initial plant startup test phase. The inspectors noted that no requirement of this kind exists for normal plant startups.

During this inspection period, the licensee determined that the survey performed in May, along with the routine periodic surveys, would satisfy the requirements of Step 9.2.15.3. This step was subsequently signed off on August 6, 1986. The final review and approval signature of Step 11.1 was obtained on August 8, 1986. The licensee plans to delete the survey requirement from the startup test procedure prior to the next startup.

The inspectors have no further concerns regarding the procedure and the completed test records for Unit 1, Cycle 9 startup. However, a concern does exist regarding the timeliness in completing a test, and the clarity in defining requirements and responsibilities. Although this appears to be an isolated case and no safety implications existed, the noted concerns will be examined in a subsequent NRC inspection.

b. Unit 2, Cycle 6

Procedure No. **2 THP 6040 PER.359, Revision 1, "Zero Power and Power Ascension Test," was used by the licensee to satisfy the startup testing requirements for the Unit 2, Cycle 6 core. The inspectors reviewed this document, and verified that the testing requirements appeared to be adequate and that the applicable steps were signed off. All steps were completed by July 29, 1986, with the exception of Step 9.2.11.4 which required a plant radiation survey. The licensee has determined that this step has no regulatory basis as discussed in Paragraph 7.a. On August 12, 1986, the licensee originated a Procedure Change Sheet (No. 4) which deleted this step from the startup procedure.

c. Conclusion

The inspection covered portions of the Unit 2, Cycle 6, startup tests as required by Procedure No. **2 THP 6040 PER.359. The areas inspected are discussed in Paragraph 2 through 6; however, some of these areas require further inspection (Paragraphs 2 and 3.b.). In addition, Open Items from previous inspection reports exist in areas related to Paragraphs 2, 4, and 6. Based on this initial review, the inspectors have no concerns regarding the Unit 2 startup testing for Cycle 6. Further inspection will be performed during a subsequent NRC inspection.

No violations or deviations were identified.

8. Exit Interview

The inspectors met with the licensee representatives (denoted in Paragraph 1) on August 14, 1986. The inspectors summarized the scope and findings of the inspection. The licensee acknowledged the statements made by the inspectors with respect to the noted concerns. The inspectors also discussed the likely informational content of the inspection report with the regard to documents or processes reviewed by the inspectors during the inspection. The licensee did not identify any such documents/processes as proprietary.