

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-315/84-14(DRS); 50-316/84-16(DRS)

Docket Nos. 50-315; 50-316

Licenses No. DPR-58; DPR-74

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

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

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

Inspection Conducted: July 23-27, 1984

Inspectors: *J. K. Heller*
J. K. Heller

8/14/84
Date

M. L. McCormick-Barger
M. L. McCormick-Barger

8/14/84
Date

Approved By: *L. A. Reyes*
L. A. Reyes, Chief
Test Programs Section

8/14/84
Date

Inspection Summary

Inspection on July 23-27, 1984 (Reports No. 50-315/84-14(DRS) and 50-316/84-16(DRS))

Areas Inspected: Routine announced inspection of Licensee Event Reports; startup test results packages; Unit 2 Cycle 4 core power distribution limits; and the Plant Nuclear Safety Review Committee's review of the Unit 2, Cycle 5 core reload analysis. The inspection involved a total of 49 inspector-hours onsite by two NRC inspectors, including 11 inspector-hours onsite during off-shifts.

Results: No items of noncompliance or deviations were identified.

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DETAILS

1. Persons Contacted

Indiana and Michigan Electric Company Personnel (Contacted in person at the D. C. Cook Plant Site)

- *W. G. Smith, Jr., Plant Manager
- *B. A. Svensson, Assistant Plant Manager
- *R. Simms, Nuclear Engineering Supervisor
- *E. A. Smarrella, Staff Assistant
- *J. F. Stietzel, QC Superintendent
- *M. W. Kennedy, QA Auditor
 - C. Ross, Technical Engineer
 - A. Barker, Quality Assurance
 - R. W. Hennen, Senior Performance Engineer
 - A. Verteramo, Senior Performance Engineer

American Electric Power System Corporation (AEPSC) Personnel (Contacted via telephone conferences from the D. C. Cook Site to the AEPSC offices in Columbus, Ohio)

- *J. M. Cleveland, Manager of Nuclear Materials and Fuel Management
- *J. G. Feinstein, Manager of Nuclear Safety and Licensing
- *E. Neymotin, Scientist
- *G. John, Senior Engineer
- *M. A. Saum, Engineer
- *W. L. Zimmermann, Engineer
- *J. L. Bell, Engineer

*Denotes those attending the exit interview on July 27, 1984.

2. Licensee Event Reports (LERs)

The inspector reviewed LERs 315/83-98 and 315/84-7. Both dealt with introduction of an error into the Detector Code* due to coding modifications. The errors were discovered when further modifications to Detector coding were required. Specific details are summarized below:

	<u>LER 83-98</u>	<u>LER 84-7</u>
Error Introduced	9-15-82	8-83
Error Discovered	10-6-83	5-22-84
Fuel Cycle Affected	Unit 1, Cycle 7	Unit 1, Cycle 8
No. of Flux Maps Affected	(All flux maps for the cycle)	(47)

* The Detector Code analyzes raw flux map data to determine compliance with power distribution technical specifications.

For LER 83-98, the error was introduced when AEPSC personnel failed to change an input data set card to reflect technical specification changes. For LER 84-7, the error was introduced when the originator of the code, Shandstrom Nuclear Associates, modified the code to allow comparison to technical specification parameters which varied with fuel types. In both cases, the coding errors could have resulted in technical specification violations, however, the licensee examined the affected flux maps and determined that no violations had occurred.

The licensee's proposed corrective actions included:

- a. A procedure modification to require independent verification of all technical specification changes,
- b. Changing their source library disk file management system from Source to Librarian to maintain a more accurate audit trail of changes made to a program, and
- c. A procedure modification to require an independent line by line verification of future changes to the Detector Code. (The licensee committed to revise the procedure by December 31, 1984.)

In addition, as a result of discussions between the inspectors and the licensee, the licensee agreed to update LER 84-7 to:

- a. Evaluate the merits of the Shanstrom Nuclear Associates corrective action recommendations contained in a letter dated May 24, 1984, from Raymond T. Shanstrom to Dr. Thomas E. Murley, USNRC Regional Administrator. (This letter, which provided written notification to the NRC of a potential 10 CFR 21 item, dealt with the same Detector Code error that was discussed in LER 84-7.)
- b. Incorporate corrective actions to ensure that the current version of the Detector Code does not contain any errors.

The inspectors have no further questions concerning the licensee's corrective actions. Implementation of the corrective actions will be reviewed during subsequent inspections. (Open Item 315/84-14-01(DRS))

No items of noncompliance or deviations were identified.

3. Unit 2, Cycle 5 Startup Test Procedure Results Packages

a. Core Power Distribution Limits

The inspector reviewed the surveillance procedure for Core Distribution Limits (2 THP 4030 STP.330 Revision 5). An irregularity was noted in Appendix A-205 to STP.330. Appendix A-205 incorrectly stated Technical Specification acceptance criteria. The inspector reviewed completed data sheets and found that the correct criteria limits were used when evaluating the data. The inspector discussed this irregularity with the Nuclear Engineering Supervisor who committed to review the matter. This is considered an unresolved item (316/84-16-01(DRS)) pending completion of the licensee review.

b. Power Coefficient

Just prior to Unit 2, Cycle 5 startup testing, the Power Coefficient of Reactivity Test was eliminated from the list of Zero Power and Power Ascension Tests to be performed. The inspector reviewed the licensee's methods for eliminating the test and determined that appropriate procedures were followed. The inspector also established that no requirements existed within the Technical Specifications or FSAR for the performance of the Power Coefficient of Reactivity Test.

c. Isothermal/Moderator Temperature Coefficient

(1) The inspector reviewed information relating to determination of the isothermal and moderator temperature coefficients as described in procedure 12 THP 6040 PER.350, Revision 0, "Isothermal Temperature Coefficient (ITC) Measurement and Moderator Temperature Coefficient (MTC) Calculation." This review resulted in the following observations:

- (a) The measured isothermal temperature coefficient of 0.70 pcm/°F met the licensee's acceptance criterion of ± 3 pcm/°F. The calculated moderator temperature coefficient of 2.44 pcm/°F met the Technical Specification requirement of ≤ 5 pcm/°F.
- (b) The expected shape of the plots used to measure the isothermal temperature coefficient is a straight line (a line with constant slope). Contrary to this, some significant slope changes were present in the ITC plots. Discussions with the licensee revealed that the Nuclear Engineering Supervisor was aware of the slope changes and that an attempt had been made by the licensee to determine the cause of the slope changes, including checking plant heatup/cooldown rates and checking to ensure that the demineralizers were isolated since the demineralizers could cause a change in the reactor coolant boron concentration. However, the licensee was unable to determine any apparent cause for the slope changes. At the inspector's request, the boron concentration at the completion of the plots, which was recorded in a separate log book, was compared to the boron concentration recorded in the data sheets prior to producing the plots. The difference in these boron concentrations (1563 ppm vs. 1577 ppm) was considered insignificant.

The fact that the licensee recognized the abnormality of the slope changes and had taken steps to investigate was not identified in the ITC Measurement and MTC Calculation Procedure results package. Rather than performing the test again, wherever more than one slope existed, the licensee used the most conservative slope as the basis

for determining the ITC. This matter is considered an unresolved item (316/84-16-02(DRS)) pending subsequent NRC inspection of the licensee's action to document the unanticipated slope change.

- (2) The inspector reviewed procedure 12 THP 4030 STP.307, Revision 6, "Moderator Temperature Coefficient Determination." During the performance of this procedure, one of the major steps, as well as all of the associated data sheets, was marked "N/A" and initialed but no justification was given for skipping the step. The fact that no justification was given for skipping the step is considered an unresolved item (316/84-16-03-U(DRS)) pending subsequent NRC inspection.

No items of noncompliance or deviations were identified.

4. Unit 2, Cycle 4 Core Power Distribution Limits

The inspector examined selected computer printouts, flux map summary sheets, and information contained in the daily plots notebook for February 1984 for Unit 2, Cycle 4. The inspector determined that the hot channel factors, quadrant tilts, and axial flux difference measurements satisfied Technical Specification requirements.

No items of noncompliance or deviations were identified.

5. Core Reload Analysis Review

The inspector reviewed the following Plant Nuclear Safety Review Committee (PNSRC) meeting minutes against Technical Specification Section 6.5.1.6 which requires review of all proposed changes to Technical Specifications and all proposed changes to plant systems or equipment that affect nuclear safety.

PNSRC Meeting Minutes #1536, May 21, 1984
PNSRC Meeting Minutes #1537, May 21, 1984
PNSRC Meeting Minutes #1565, June 25, 1984

These meeting minutes indicated that the PNSRC had reviewed and approved the Unit 2, Cycle 5 core reload analysis and the Technical Specification changes required as a result of that analysis.

No items of noncompliance or deviations were identified.

6. Open Items

Open items are matters which have been discussed with the licensee, which will be reviewed further by the inspector, and which involve some action on the part of the NRC or licensee or both. An open item disclosed during the inspection is discussed in Paragraph 2.

7. 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. Unresolved items disclosed during the inspection are discussed in Paragraphs 3.a, 3.c.(1)(b), and 3.c.(2).

8. Exit Interview

The inspectors met with licensee representatives (denoted in Paragraph 1) on July 27, 1984 to discuss the scope and findings of the inspection. The licensee acknowledged the statements made by the inspectors with respect to the items discussed in the report.