U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-315/85021(DRS); 50-316/85021(DRS)

Docket No. 50-315; 50-316 License No. DPR-58; and 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 15 through 18, 1985

Inspectors: P. L. Eng P.L. Eng 8/8/85
Date

W. E. Milbrot W.E. Milbrot 8/8/85
Date

Approved By: W. G. Guldemond, Chief
Operational Programs Section
Date

Inspection Summary

Inspection on July 15 through July 18, 1985 (Report No. 50-315/85021(DRS); 50-316/85021(DRS))
Areas Inspected: Routine, announced inspection of licensee actions on previous inspection findings; inservice testing program for valves; refueling activities; and licensee actions regarding IE Bulletin 84-03. The inspection involved a total of 50 inspector-hours onsite by two NRC inspectors.
Results: Of the four areas inspected, one violation was identified (failure to follow procedures - Paragraph 4).

DETAILS

1. Persons Contacted

*W. G. Smith, Jr., Plant Manager
*J. D. Allard, Maintenance Superintendent
*K. R. Baker, Operations Superintendent
*N. Baker, Quality Control Department Assistant
T. P. Beilman, Planning Supervisor
*A. A. Blind, Assistant Plant Manager
*J. R. Bobay, Project Superintendent - Planning
*C. A. Freer, Quality Control/ Inservice Inspection
*L. S. Gibson, Technical Superintendent
M. L. Horvath, Quality Assurance Supervisor
T. Kriesel, Technical Superintendent - Physical Sciences
*M. A. Lester, Senior Performance Engineer
*T. K. Postlewait, Performance Supervisor
*R. Simms, Station Superintendent
*T. R. Stephens, Performance Engineer - Operations
*J. F. Stietzel, Quality Control Superintendent
*M. S. Ackerman, Nuclear Safety & Licensing, AEPSC
*S. A. Mc Aligott, Quality Assurance Auditor, AEPSC

*Denotes those attending the exit interview held on July 18, 1985.

Additional plant technical and administrative personnel were contacted during the course of the inspection.

2. Action of Previous Inspection Findings

a. (Closed) Violation (315/84-13-01(DRS); 316/84-15-01(DRS)) Turbine Driven Auxiliary Feed Pump (TDAFP) discharge pressure allowed to violate Technical Specification (TS) limits. The licensee has submitted a proposed TS change clarifying temperature bases for TS limits on the TDAFP and deleted the provision for temperature compensation from the TDAFP test procedure.

b. (Open) Unresolved Item (315/84-13-03(DRS); 316/84-15-03(DRS)): Response time testing of the turbine driven auxiliary feedwater pump per technical specification requirements. This item remains open as the licensee has not identified the test method to be used. The licensee indicated that testing would be performed in conjunction with the TDAFP test scheduled during the startup of Unit 1 and the next scheduled quarterly TDAFP test for Unit 2.

c. (Closed) Unresolved Item (315/84-12-03(DRS); 316/84-14-03(DRS)); 96 hour operability determination. The licensee has incorporated the action limits for the inservice testing of pumps into the test procedures and inserted operability limits into the technical data book located in each unit's control room, thereby providing the data for operability determination immediately following completion of surveillance testing.

d. (Closed) Violation (315/84-13-06(DRS); 316/84-15-06(DRS)): Failure to implement an inservice testing program conducive to identifying conditions adverse to quality. The licensee has taken the following actions in response to the violation:

(1) Limiting stroke times for valves are being revised. The licensee has identified alert and action times in accordance with Code requirements for valves based on the first four inservice test times obtained following initial implementation of the inservice testing program. The licensee stated that these times will be used for component operability determination by December 31, 1985.

(2) The licensee has revised its valve stroke time records to include all stroke time data including post modification and maintenance data. In addition, an increased frequency log has been established to document those valves which are tested on increased frequency. A matrix of like valves to be used for evaluation of generic concerns is being prepared and will be in use by December 31, 1985. Program level documentation for valve problems is addressed in licensee procedure 12-QHP-5070ISI.014, "ISI Valve Data Recording and Corrective Action for Power Operated Valves," Revision 0, dated April 1, 1985. The inspector provided an information copy of an Office of Nuclear Reactor Regulation (NRR) memo, attached, clarifying the NRC interpretation of maximum stroke time requirements for inservice testing of valves.

(3) The licensee stated that a fixed set of maximum valve stroke time alert and action ranges, which are in accordance with Code acceptance criteria, will be used to determine the status of the valve in lieu of the percent increases of valve stroke times as defined in Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, 1974 Edition including the appropriate addenda. Changes to these acceptance criteria will be evaluated in a manner similar to that described in Section XI for pump reference value changes. Licensee procedure 12-QHP-5070ISI.014 requires that infrequently tested valves exhibiting unacceptable increases in stroke times be evaluated or repaired prior to mode change of the affected unit. This is acceptable.

With regard to leak test trending, the licensee stated that they have requested relief from the trending requirements for containment isolation valves (CIV); however, trending will be performed for leak tested valves which are not CIVs. This matter is discussed further in Paragraph 3.

The licensee has effectively addressed the concerns identified by the violation.

e. (Open) Unresolved Item (315/84-13-07(DRS); 316/84-15-07(DRS)): Remote position indication verification of all valves. The licensee responded to this item by letter dated April 12, 1985, indicating

that remote position verification for Unit 1 valves will be completed prior to the end of the current outage; Unit 2 valves will be completed by the end of the unit's next scheduled outage. The inspector expressed concern that procedures for verifying remote position indicators for accessible valves have not been written. The licensee maintains that remote position verification for Unit 1 valves will be completed prior to the end of the current outage; Unit 2 valves will be completed by the end of the unit's next scheduled outage. This item remains open pending completion of the licensee's commitment in their April letter.

f. (Open) Open Item (315/84-13-08(DRS); 316/84-15-08(DRS)): Recording first stroke for valve timing. The licensee has issued a memo to equipment operators and operations staff requiring that the first stroke time for a valve be used for operability determination. In addition, the licensee is in the process of incorporating the requirement into all valve stroke time procedures. This item remains open pending inspector review of the procedures and test data.

g. (Open) Open Item (315/84-13-09(DRS); 316/84-15-09(DRS)): Valve stroke time limits not provided to maintenance for post modification testing. The licensee stated that the method of providing the revised stroke times discussed in Paragraph 2.d.(1) for post modification/ maintenance testing has not yet been determined but will be accomplished by December 31, 1985. Availability and review of post maintenance/ modification test data will be reviewed in subsequent inspections.

h. (Closed) Open Item (315/84-13-10(DRS); 316/84-15-10(DRS)): Review of valve leak test data for validity. The licensee has revised procedure 12 THP 4030.STP.226, "Surveillance Test Procedure RHR and SI System Check Valves," to include a precaution statement addressing verification of zero valve leak rates with regard to magnetically coupled rotameters. The licensee has evaluated previous valve leak test data and found it acceptable.

i. (Closed) Open Item (315/84-13-12(DRS); 316/84-15-12(DRS)): Correlation of January bearing temperatures to summer conditions. The licensee has rescheduled inservice testing annual bearing temperature measurements to August.

j. (Closed) Open item (315/84-13-13(DRS); 316/84-15-13(DRS)): Use of acceptance ranges for both flow and pressure during inservice testing of pumps. The licensee stated that due to flow anomalies, achieving the exact reference value flow was extremely difficult, and flow and the corresponding observed pressure used to determine pump operability were subject to the limitations and instrument requirements delineated in the ASME Code. The inspector reviewed the licensee's records and correction factor used for correcting test pressures based on observed flow and found them acceptable.

3. Inservice Testing Program for Valves

During the review and discussions with members of the licensee's staff regarding closure of the violation discussed in Paragraph 2.d of this report, the inspector noted that the licensee had not addressed trending and evaluation requirements for valve leak testing as delineated in Subsections IWV-3420f and IWV-3420g of Section XI. The inspector provided a copy of a memo from NRR, attached, regarding valve leak testing and stated that the requirements of IWV-3420f and IWV-3420g apply. The licensee representatives stated that they would evaluate the position stated in the subject memo and seek further clarification from NRR on this subject. Implementation of valve leak test trending by the licensee per the Code requirements or the granting of relief from said requirements by the Commission will be tracked as an open item (315/85021-01(DRS); 316/85021-01(DRS)).

No violations or deviations were identified.

4. Refueling Preparations

The inspector reviewed procedures, tests and surveillances covering the maintenance, testing and operational check out of refueling tools, equipment and systems required to support the fuel loading effort to assure that the applicable Technical Specifications have been included. Equipment and components to be used during the performance of refueling activities were checked for proper operation and verified ready for use. The inspector also reviewed completed surveillances that had to be met prior to entry into Mode 6. The surveillances were completed as required.

Fuel handling personnel training was completed as required and results documented on a qualification letter and personal work experience records.

The inspector reviewed several completed refueling procedures for core alteration preparations. The review included recording of required data and verification sign offs. Two of the procedures reviewed were Westinghouse Refueling Procedure FP-AEP-R8, Revision 8, paragraph 9.2.6, "Reactor Cavity Seal Ring Installation and Removal," and paragraph 9.2.8, "Reactor Vessel Head Removal and Installation." Two record copies are maintained of the Westinghouse refueling procedures. When the refueling work area is within a contaminated area, a working copy of the procedure is provided at the job site and the two record copies are maintained in a contamination free location. Both record copies are considered official copies. One is retained by the licensee and the other by Westinghouse upon completion of the refueling. The licensee has no administrative procedures governing verification sign offs. When special sign off conditions are involved, the licensee will provide additional instructions in the particular procedure. No special instructions covering sign offs were contained in the refueling procedures reviewed by the inspector. Review of the subject refueling procedures revealed the following verification sign off discrepancies and inconsistencies:

a. Procedure 9.2.6, "Cavity Seal Installation", steps 1 through 12.

Status: Work complete
Sign offs made in both record copies; no sign offs made in working copy.

b. Procedure 9.2.6, "Reactor Cavity Seal Removal", steps 1 through 4.

Status: Work not started
Sign offs made in one record copy; no sign offs made in the second record copy or working copy.

c. Procedure 9.2.8, "Reactor Head Removal", item c.

Status: Work complete
Sign off not made in either record copy; sign off made in working copy

d. Procedure 9.2.8, "Reactor Head Installation", steps A through E. (Reactor Head reinstalled temporarily to support instrumentation maintenance work prior to core alterations.)

Status: Work complete
No sign offs made in either record copy; sign offs made in working copy.

Items a, c, and d indicate a lack of control regarding required verification signatures that identify satisfactory work completion. Item b is a condition where sign offs were made for a work operation that had not commenced. Failure of the licensee to follow refueling procedures as required by Technical Specification 6.8.1 is a violation (315/85021-02(DRS)).

No other violations or deviations were identified.

5. Followup of IE Bulletin 84-03, Refueling Cavity Water Seal

On August 24, 1984, the NRC issued IE Bulletin (IEB) 84-03 to all power reactor facilities. The IEB, which described the events surrounding a refueling cavity water seal failure at the Haddam Neck facility, required licensees to evaluate the potential for and consequences of a seal failure and to submit a summary report supporting their conclusions.

On November 27, 1984, the licensee submitted the required report. In that report the licensee identified design differences between the seal used at D. C. Cook and the seal used at Haddam Neck, seal installation techniques to be followed, the D. C. Cook postulated seal failure accident based upon the failure of the inflated portion of the seal, the capacity of available cavity water makeup systems, an assessment of no fuel becoming uncovered, and emergency procedures in place to mitigate the consequences of such an event.

During the inspection, the inspector reviewed the licensee's response and supporting information which included the potential for loss of refueling cavity and/or spent fuel pit (SFP) water inventory by means other than

cavity seal failure with the following results:

a. The annulus between the reactor vessel and the refueling floor was measured to determine gap dimensions and inspected for cleanliness and uniformity. The nominal two inch gap had a maximum deviation of 0.109 inch which is in agreement with original construction drawings.

b. Prior to seal installation, a 20 psig bubble test was performed on the entire seal ring. No leaks were detected. The annulus was inspected for sharp edges, burrs, etc., that could damage the seal. Discontinuities were removed as required.

c. Following installation, seal integrity was confirmed by pressurizing the seal to 45 psig and verifying a pressure decrease of less than one psi for one hour. Seal pressure was then reduced to the operating range (15-35 psig) and the nitrogen supply line relief valve set at 40 psig. In addition, RTV was applied to the vessel-seal and refueling floor-seal interfaces.

d. The licensee is evaluating cavity seal receipt inspection requirements. Currently, cavity seal receipt inspection consists of inspecting for apparent shipping damage and that the item appears to be the item ordered. The licensee is considering a revision to the inspection acceptance criteria which will require the vendor to furnish a "certificate of conformance" to the licensee assuring that the Presray seal, PRS 585, meets material, dimension, and hardness requirements.

   The inspector considers that the upgraded seal receipt inspection criteria are necessary to assure seal acceptability. Revision of the licensee's cavity seal receipt inspection requirements will be tracked as an open item (50-315/85021-03(DRS)).

e. A new seal or a seal retained from a previous refueling may be installed in the refueling cavity. The seals have been added to the plant shelf life program to protect from using a deteriorated seal. Present shelf life has been established at 60 months.

f. The licensee has conducted an evaluation of fuel height drop. Based on an evaluation of Westinghouse and plant drawings, the maximum fuel height drop would be 14 inches. Testing conducted by TVA and Duke have demonstrated seal adequacy based on a two foot drop onto the Presray 585 seal installed in a two inch annulus. Consequently, the licensee does not intend to conduct additional tests.

g. Procedures are in effect directing that fuel suspended from either the Manipulator Crane or Spent Fuel Pit (SFP) crane be placed in a safe location to prevent becoming uncovered during a loss of water accident. The procedures also provide instructions for closing the Transfer Tube Valve and the Weir Gate on the SFP.

h. The licensee stated that the SFP could not drain to within two feet of the stored fuel. This was based on engineering judgement following administrative action of aforementioned procedures to recover from a small leak. It was estimated that should the seal fail and the SFP drain to the lowest possible reactor level, seven inches of water will always cover the fuel. This is sufficient to ensure adequate cooling. Fuel in the core will be covered by greater levels of water.

i. The licensee concludes, based on engineering judgement, that if the active portion of the seal (the inflated lower portion) was to fail, the passive portion, (the solid wedge shaped upper portion) of the seal would limit leakage to less than the makeup capacity of 4500 gallons per hour. This would provide additional time for mitigation.

It is concluded that the licensee has adequately resolved the issues identified in IEB 85-03 and the IEB is closed.

During the inspection, a review was conducted to determine if other potential mechanisms for loss of water from the refueling system existed. These potential leakage paths include NI detector well covers, sand plug covers, refueling canal drain covers, refueling cavity floor drain valve, transfer tube to unit not being refueled, Residual Heat Removal System, steam generator nozzle dams and reactor vessel head O-ring seal leakoff line. Procedures are in place to verify that all covers are properly sealed and bolted and that valve line ups are correct prior to flooding. It was determined that none of these potential leak paths would lead to catastrophic failure resulting in water uncovering stored fuel.

It is concluded that the issue of loss of refueling system water inventory is adequately resolved.

No violations 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. Open items disclosed during the inspection are discussed in Paragraphs 3 and 5.d.

7. Exit Interview

The inspectors met with licensee representatives (denoted in Paragraph 1) on July 18, 1985, to discuss the scope and findings of the inspection. The licensee acknowledged the statements made by the inspectors with respect to items discussed in the report. The inspectors also discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspectors during the inspection. The licensee did not identify any such documents/processes as proprietary.