

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-315/84-12(DRP); 50-316/84-14(DRP)

Docket Nos. 50-315; 50-316

Licenses No. DPR-58; DPR-74

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

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

Inspection At: Donald C. Cook Site, Bridgman, MI

Inspection Conducted: June 11, 1984 through July 27, 1984

Inspectors: E. R. Swanson

J. K. Heller

R. J. Leemon

Approved By: G. C. Wright, Chief

Projects (Section 2A)
W D Shop for

8-29-84
Date

Inspection Summary

Inspection on June 11, 1984 through July 27, 1984 (Reports No. 50-315/84-12(DRP); 50-316/84-14(DRP))

Areas Inspected: Routine unannounced inspection by the resident inspector of Licensee Action on Previous Inspection Findings; operational safety; surveillance; licensee event reports; bulletins; maintenance; refueling; plant trip; regional request; and management meeting - Regulatory Performance Improvement Program (RPIP). This inspection involved a total of 381 inspector-hours by three NRC inspectors including 73 inspector-hours during off-shifts.

Results: Of the ten areas inspected no items of noncompliance were identified in eight areas; three items of noncompliance were identified in one area and one item of noncompliance was identified in the remaining area (Securing a reactor coolant pump without tripping the required bistables, failure to comply with the alarm response procedure, inadequate procedure for establishing recirculation flow - Paragraph 2; two safety injection pumps simultaneously inoperable - Paragraph 4).

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DETAILS

1. Persons Contacted

- a. Personnel attending June 21, 1984 Regulatory Performance Improvement Meeting.

Indiana and Michigan Electric Company

J. E. Dolan, Vice Chairman Engineering and Construction (AEPSC)
M. P. Alexich, Vice President Nuclear Engineering (AEPSC)
W. G. Smith, Jr., Plant Manager
B. A. Svensson, Assistant Plant Manager
E. L. Townley, Assistant Plant Manager
R. F. Kroeger, Quality Assurance Manager (AEPSC)
T. P. Beilman, Quality Assurance Supervisor (AEPSC)
J. F. Stietzel, Quality Control Superintendent
B. H. Bennett, Assistant Manager Nuclear Engineering (AEPSC)
P. A. Barrett, Safety and Licensing (AEPSC)
J. G. Finestein, Safety and Licensing (AEPSC)
E. A. Smarrella, Staff Assistant
R. S. DiStefano, Nuclear Operation Support (AEPSC)
F. S. VanPelt, Nuclear Operation Support (AEPSC)

NRC Attendees

A. B. Davis, Assistant Regional Administrator
W. D. Shafer, Chief, Projects Branch No. 2
G. C. Wright, Chief, Projects Section 2A
E. R. Swanson, Senior Resident Inspector
J. K. Heller, Resident Inspector
R. J. Leemon, Resident Inspector
S. A. Varga, Chief, O.R. Branch No. 1, Division of Licensing, NRR
D. L. Wigginton, Project Manager O.R. Branch 1, Division of Licensing, NRR

b. Personnel Contacted During Inspection Activities

*W. G. Smith, Jr., Plant Manager
*E. Townley, Assistant Plant Manager
*B. Svensson, Assistant Plant Manager
*T. Kriesel, Technical Superintendent - Physical Science
*A. Blind, Technical Superintendent - Engineering
K. Baker, Operations Superintendent
*D. Dudding, Maintenance Superintendent
J. Stietzel, Quality Control Superintendent
D. Palmer, Plant Radiation Protection Supervisor
*T. Beilman, Quality Assurance Supervisor
*C. Murphy, Operations Production Supervisor

The inspectors also contacted a number of licensee and contract employees and informally interviewed operation, technical and maintenance personnel during this period.

*Denotes personnel attending exit interview on August 9, 1984.

2. Licensee Action on Previous Inspection Findings

(Closed) Open Item (315/82-04-06(DPRP): Automatic rod control stepped control rods out on high Tave. Review by AEPSC stated that the Tave - lead lag module TY-412P had an intermittent fault which probably caused the problem. The module was replaced and the problem has not recurred.

No items of noncompliance or deviations were identified.

3. Operational Safety Verification

The inspector observed control room operations including shift turnover, reviewed applicable logs and conducted discussions with control room operators during the period of June 11 through July 27, 1984. The inspector verified the operability of selected emergency systems, reviewed tagout records, verified proper return to service of affected components and verified a portion of the containment isolation lineup. Tours of Unit 1 and 2 auxiliary building, Unit 2 containment, turbine building, and screenhouse were conducted to observe plant equipment conditions, including potential fire hazards, fluid leaks, and excessive vibrations and to verify that maintenance requests had been initiated for equipment in need of maintenance.

The inspector by observation and interview verified that the physical security plan was being implemented in accordance with the station security plan.

The inspector performed a walkdown/review of the system listed below to verify that: each accessible flow path valve was in its correct position; power (visual breakers and fuses) was aligned to actuate on automatic signal; essential instrumentation was operable and; no condition existed that degraded the system.

- a. Control Room Emergency Core Cooling System instrument and valve lineup.
- b. Emergency Diesel Generator air starting system using licensee print OP-1-5150A

At 2300 hours on June 26, 1984 with Unit 2 in Mode 4 a reactor operator discovered that the Containment Spray Pump discharge piping pressure was 380 PSIG when normal pressure is 30 PSIG. Investigation revealed that the reactor coolant system hot leg was connected to the containment spray suction through the residual heat removal suction piping. This lineup coupled with leaking containment spray pump discharge valves resulted in water leaking into the lower containment. The actual amount of water could not

be calculated due to sump inleakage from other sources. The containment spray and residual heat removal piping was cross-connected approximately 12 hours earlier when a plant operator opened the manual suction isolation valve from the containment sump (RH 104W) as required by step 16 of Data/Signoff sheet 5.5, "RHR System Operability Check" to procedure 2 OHP 4021.001.001, "Plant Heatup From Cold Shutdown to Hot Standby." Upon discovery change 3 was issued to 2 OHP 4021.001.001, Revision 6 to close RH-104W.

On June 28, the inspector notified the licensee that the procedure for initiation of Emergency Core Cooling (2 OHP 4022.008.002) did not address opening the manual valves RH 104E and RH 104W. This would have been required to establish emergency core cooling flow from the containment sump to the suction of the residual heat removal pump during the recirculation phase while the plant was in Mode 4. Valves RH 104E and 104W were repositioned to open when the plant secures from shutdown cooling. This occurred at 1515 hours on June 29, 1984. Technical Specification 3.5.3.d requires, in Mode 4, an operable flow path capable of taking suction from the refueling water storage tank upon being manually realigned and transferring suction to the containment sump during the recirculation phase of operation. Technical Specification 6.8.1.a requires that written procedures shall be established, implemented and maintained covering the activities/procedures recommended in Appendix "A" of Regulatory Guide 1.33, November 1972, which includes procedures for loss of coolant. Failure to provide the instruction necessary to establish flow to the residual heat removal pumps during the recirculation phase of operation as described above is a violation of Technical Specification 6.8.1.a (Noncompliance Item 316/84-14-01).

During a control room tour at 0800 hours on July 10, 1984 the inspector noted that Unit 2 was in Mode 3 with three Reactor Coolant Pumps running and the pump associated with Loop 3 secured. The pump had been secured approximately five hours earlier, at 0240 hours, due to lower bearing seal water high temperature. When the pump was secured, Loop 3 RTD bypass flow went low; an expected condition. The alarm response procedure for Loop 3 RTD flow low (2 OHP 4024.207.003) requires that the operators defeat the abnormal loop signals by using the Delta T and Tavg Defeat Control Switch and placing the associated loop bistables in the tripped condition. The inspector found the Delta T and Tavg Defeat Control Switches and the loop bistables in normal. Additionally, the Delta T, overpower Delta T and overtemperature Delta T were being recorded from Loop 3. Three pump operation in Mode 3 is allowed by Table 3.3-3, line 4d to Technical Specification 3.3.2.1, provided the channel(s) associated with the protective functions derived from the out-of-service reactor coolant loop were placed in the tripped mode. When the inspector convinced the licensee that they were in violation of the Technical Specification, the alarm response procedure actions were taken. These actions were verified by the inspector.

Failure to place the protective functions provided from the out-of-service Reactor Coolant Loop 3 in the tripped mode is a violation of Table 3.3-3, item 4d to Technical Specification 3.3.2.1 (Noncompliance Item 316/84-14-02).

On July 24, the inspector was verifying the licensee's actions for Unit 1 control room annunciator for Loops 1,2,3 and 4 Tavg Low-Low. Loop 4 Tavg had failed the previous day at 1407 hours. The licensee's actions were to place the defeat control switches for Delta T and Tavg in defeat and place the bistables for Loop 4 in trip. These actions were verified by the inspector and complied with Technical Specification 3.3.1.1 and 3.3.2.1. The inspector reviewed the annunciator response sheet for Loops 1,2,3 and 4 Tavg Low-Low (1 OHP 4024.111.002) and found that in addition to the above actions paragraph 2.2.3 requires the operators start a log sheet and record true Tavg temperature each 30 minutes until repairs are made and the alarm is again monitoring Low-Low Tavg. The operators had not been recording the reading and began when the inspector informed them of the requirement. Failure to totally implement 1 OHP 4024.111.002 was discussed with the Unit Supervisor, Shift Supervisor and Operations Superintendent (acting).

Technical Specification 6.8.1.a states that written procedures shall be established, implemented and maintained covering the applicable procedure recommended in Appendix "A" of Regulatory Guide 1.33, November 1972. Appendix "A", paragraph E requires a procedure for correcting abnormal, off-normal or alarm conditions. Failure to implement procedure 1 OHP 4024.111.002, as described above is a violation of Technical Specification 6.8.1.a. (Non-compliance Item 315/84-12-01)

These reviews and observations were conducted to verify that facility operation was in conformance with the requirements established per Technical Specifications, 10 CFR, and Administrative Procedures.

Three items of noncompliance and no deviations were identified.

4. Monthly Surveillance Observation

The inspector reviewed Technical Specifications required surveillance testing on the systems listed below and verified that testing was performed in accordance with adequate procedures, that test instrumentation was calibrated, that limiting conditions for operation were met, that removal and restoration of the affected components were accomplished, that test results conformed with technical specifications and procedure requirements and were reviewed by personnel other than the individual directing the test, and that any deficiencies identified during the testing were properly reviewed and resolved by appropriate management personnel.

Unit 1

1 OHP 4030 STP.005	Emergency Core Cooling System Operability Test
1 OHP 4030 STP.032	Quadrant Power Tilt Ratio Calculation
1 THP 4030 STP.218	Automatic Operation of Auxiliary Feedwater Pumps

Unit 2

12 THP 4030 STP.362	Incore - Excore Detector Calibration
12 THP 4030 STP.204	Personnel Airlock Leakage and Interlock Surveillance Test
2 THP 4030 STP.219	Reactor Coolant System Flow Verification
2 OHP 4030 STP.029	Reactor Thermal Power Determination

During the performance of the Emergency Core Cooling System Operability Surveillance Test (1 OHP 4030 STP.005) to verify operability of the Unit 1 "S" safety injection pump check valves the licensee made both safety injection pumps inoperable at 0445 hours on July 16, while the plant was in Mode 1. STP.005 was written for use when testing either train of ECCS equipment. When instruction for testing common component were contained in the same paragraph the instructions pertaining to safeguards train B were given in parenthesis. The steps that were being performed were:

- . Q8.5.1 Place N (S) SI pump control switch in LOCKOUT
- . Q8.5.2 Close SI-103N (SI-103S) injection pump suction
- . Q8.5.3 Close SI-106N (SI-106S) injection pump recirculation

(Step Q8.5.1 was performed in the control room and Steps Q8.5.2 and Q8.5.3 were performed at the pump).

The crew was expected to place the "S" safety injection pump control switch in lockout and close the "S" injection pump suction valve (SI-103S) and "S" injection pump recirculation valve (SI-106S). The reactor operator had placed the "S" safety injection pump control switch in lockout; however, the auxiliary equipment operator closed the "N" injection pump suction valve (SI-103N) and closed the "N" injection pump recirculation valve (SI-106N) making both pumps inoperable. After closing SI-106N and SI-103N the auxiliary equipment operator notified the control room that the step was complete. The reactor operator requested confirmation of the valve numbers at which time the valving error was identified and the correct lineup obtained.

The operators estimated the pumps were inoperable for three to five minutes.

STP.005 at paragraph 4.1 requires that this test shall be performed on only one emergency core cooling system train at a time. When one train is being tested, the other train must be in an operable status with the flow path in a normal valve lineup. An operable train is comprised of: one operable centrifugal charging pump; one operable safety injection pump; one operable residual heat removal pump; one operable residual heat removal heat exchanger and an operable flow path from refueling water storage tank and transferring to the containment sump on a recirculation phase of operation.

Technical Specification 6.8.1.c states written procedures shall be established, implemented and maintained for Surveillance and test activities of safety related equipment.

Failure to implement STP.005 by maintaining one operable emergency core cooling train is a violation of Technical Specification 6.8.1.c. (Non-compliance 315/84-12-02)

During review of the Donald C. Cook ASME Boiler and Pressure Vessel Code Section XI ISI Pump Test Program (12 THP 4030 STP.222) the inspector found a potential problem with the licensee interpretation of paragraph IWP 3220 which states; all data shall be analyzed within 96 hours after completion of a test; and paragraph IWP 3230(c) which states; if the pump data fails within the required Action Range then the pump shall be declared inoperable.

The licensee program requires the On-Shift Supervisor to review the pump Surveillance Test and determine pump operability by comparing the data with the one point acceptance criteria specified in the Technical Specifications. The surveillance is then sent to the Performance Engineer who will review the test for Section XI acceptance. STP.222 requires this review to be completed within 96 hours. If the pump is determined to be in the required Action Range then, at that time, the pump is declared inoperable and the appropriate Action Statement entered. Basically, the licensee program can add 96 hours to pump inoperability when determined by surveillance testing.

The inspector reviewed this item with the licensee and provided them with a copy of a memo from Samuel E. Bryan to R. C. Lewis which pertains to operability requirements for pumps. This memo basically states that once data become available which shows the pump cannot meet the inservice inspection requirements and by definition cannot fulfill its function, then the pump must be declared inoperable.

During this discussion the inspector indicated to the licensee that the test should be written so pump operability/inoperability can be determined when the data is available. The licensee has this item under review.

Because of the above identified item and a weakness noted in Inspection Report 315/84-11; 316/84-12(DPRP) pertaining to pump vibration acceptance criteria, the inspector has requested a followup inspection by NRC region-based, specialist inspectors. This is an unresolved item pending this review. (Unresolved Item 315/84-12-03; 316/84-14-03)

5. Licensee Event Report Followup

Through direct observation, discussions with licensee personnel, and review of records, the following event reports were reviewed to determine that reportability requirements were fulfilled, immediate corrective action was accomplished, and corrective action to prevent recurrence had been accomplished or initiated in accordance with Technical Specifications. The following items were closed:

Unit 1

RO 83-103/03L-0	Fire Water Isolated to Spent Fuel Pool Ventilation
RO 83-110/03L-0	Fire Suppression Water Isolated to Drumming Room

Unit 2

RO 82-026/03L-0	Reactor Coolant System Pressure less than 2200 PSIG
RO 83-052/03L-0	Reactor trip due to loss of control room Instrument Distribution Inverter
RO 83-081/03L-0	Reactor trip due to loss of control room Instrument Distribution Inverter
RO 84-010-0	Reactor trip due to loss of control room Instrument Distribution Inverter

No items of noncompliance or deviations were identified.

6. Monthly Maintenance Observation

Station maintenance activities of safety related systems and components listed below were observed and/or reviewed to ascertain that they were conducted in accordance with approved procedures, regulatory guides and industry codes or standards and in conformance with Technical Specifications.

The following items were considered during this review; the limiting conditions for operation were met while components or systems were removed from service; approvals were obtained prior to initiating the work; activities were accomplished using approved procedures and were inspected as applicable; functional testing and/or calibrations were performed prior to returning components or systems to service; quality control records were maintained; activities were accomplished by qualified personnel; parts and materials used were properly certified; radiological controls were implemented; and, fire prevention controls were implemented.

The following maintenance activities were observed and/or reviewed:

RFC DC 12-2593	Replace Control Room Westronic Recorders
Job Order 039462	Replace SG-5 Westronic Recorder on the turbine metal temperature
RFC 12-1858	Replacement of Capacitors in CRID inverters

7. IE Bulletins

For the IE Bulletins listed below the inspector verified that the Bulletin was received by licensee management and reviewed for its applicability to the facility. If the Bulletin was applicable the inspector verified that the written response was within the time period stated in the Bulletin, that the written response included the information required to be reported, that the written response included adequate corrective action commitments based on information presented in the Bulletin and the licensee's response, that licensee management forwarded copies of the written response to the appropriate onsite management representatives, that information discussed in the licensee's written response was accurate, and that corrective action taken by the licensee was as described in the written response.

IE Bulletin 84-01	Cracks in Boiling Water Mark I Containment Vent Headers. (This Bulletin is not applicable to the Donald C. Cook Plant).
IE Bulletin 84-02	Failures of General Electric Type HFA Relays In Use In Class 1E Safety Systems.

No items of noncompliance or deviations were identified.

8. Refueling - Unit 2

The licensee completed a 120 day refueling/maintenance outage for Unit 2 on July 7, when the plant was taken critical at 0323 hours. Once the plant was critical the licensee began low power physics testing, a portion of which was observed by the resident inspector. Data review was performed by a Region III specialist inspector and documented in Inspection Report 316/84-16.

The licensee performed a Containment Intergrated Leak Rate Test (CILRT) for Unit 2 from June 14 to June 17. A Region III specialist inspector had reviewed the CILRT procedure (2 THP 4030 STP.202) and will evaluate the leak rate data to verify the licensee calculation of the leak rate. This review will be documented in Inspection Report 316/84-13. The resident inspector witnessed portions of the CILRT and verified that: appropriate procedure revision and change sheets in use by test personnel; test pre-requisites were met; proper plant systems were in service or tagged out-of-service; instrumentation was calibrated; and valve lineups were completed in accordance with the test procedure. In addition, the inspector performed an independent post CILRT containment inspection for equipment degradation after blowdown.

No items of noncompliance or deviations were identified.

9. Regional Request

The licensee was requested on July 23, 1984 to review the following Part 21 report:

- Westinghouse notified NRC by telephone on July 12 of possible design errors in the component cooling water systems of the following operating plants: Turkey Point 3 & 4; H. B. Robinson; Indian Point 2 & 3; Salem 1 & 2; Kewaunee; Ginna and Zion 1 & 2 when the CCW Surge Tank vent motor operated valve goes closed on high radiation. Pressure in the CCW Surge Tank could increase to the Surge Tank relief valve set point. The combined pressure of the Surge Tank relief pressure, the elevation head and the CCW pump discharge head could overpressurize the CCW piping downstream of the CCW pump, since this piping is generally 150 PSIG piping. Westinghouse has suggested disabling the motor operated vent valve in the open position to prevent the overpressurization. Westinghouse said that the above mentioned plants have been notified. Some plants under construction are also affected. Westinghouse will submit a Part 21.

The licensee evaluation determined that the elevated discharge pressure would not exceed the rating of CCW pump discharge piping.

No items of noncompliance or deviations were identified.

10. Plant Trip

On June 17, 1984 at 2034 hours while in Mode 1 and operating at 68% power a Unit 1 reactor trip and safety injection occurred from loss of Control Room Instrument Distribution (CRID) IV inverter. The reactor tripped due to indication of low reactor coolant system flow with reactor power greater than P-8 setpoint. The safety injection occurred due to an indication of low steamline pressure concurrent with high steam flow caused by operation of the steam dumps. The cause of the CRID failure was determined to be a shorted C-2 capacitor which failed as the result of high ambient temperatures. The capacitors in CRIDs I, II, III and IV were replaced with capacitors having a higher temperature rating prior to returning the unit to service.

Following the plant trip the inspector ascertained the status of the reactor and safety systems by observations of control room indicators and discussions with licensee personnel concerning plant parameters and emergency system status. All systems operated as designed. The plant was made critical on June 22, at 1423 hours.

No items of noncompliance or deviation were identified.

11. Management Meeting - Regulatory Performance Improvement Program (RPIP)

A management meeting was held on June 21, 1984, at the Donald C. Cook plant site to update the status of the RPIP dated February 23, 1984 (AEP:NRC:0625F).

Following discussion of updated status the NRC proposed meeting again in September with monthly updates provided for the resident inspector. The licensee agreed to this proposal.

No items of noncompliance or deviation were identified.

12. 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. The item disclosed during this inspection is discussed in Paragraph 4.

13. Exit Interview

The inspector met with licensee representatives (denoted in Paragraph 1) throughout the month and at the conclusion of the inspection period and on August 9, 1984, and summarized the scope and findings of the inspection activities. The licensee acknowledged these findings.