

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-315/87024(DRP); 50-316/87024(DRP)

Docket Nos. 50-315; 50-316

Licenses No. DPR-58; DPR-74

Licensee: 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, Michigan

Inspection Conducted: August 25 through September 28, 1987

Inspectors: B. L. Jorgensen  
J. K. Heller

Approved By: *B. L. Burgess*  
B. L. Burgess, Chief  
Projects Section 2A

*10/9/87*  
Date

Inspection Summary

Inspection on August 25 through September 28, 1987 (Reports No. 50-315/87024(DRP);  
No. 50-316/87024(DRP))

Areas Inspected: Routine unannounced inspection by the resident inspectors  
of: actions on previously identified items; plant operations; radiological  
controls; maintenance; surveillance; fire protection; security; outages; and,  
training and qualification effectiveness.

Results: Of the nine areas inspected, no violations or deviations were  
identified in any areas.

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## DETAILS

### 1. Persons Contacted

- \*W. Smith, Jr., Plant Manager
- \*A. Blind, Assistant Plant Manager, Administration
- \*J. Rutkowski, Assistant Plant Manager, Production
- \*L. Gibson, Assistant Plant Manager, Technical Support
- \*B. Svensson, Licensing Activity Coordinator
- \*T. Kriesel, Technical Superintendent, Physical Sciences
- K. Baker, Operations Superintendent
- \*J. Sampson, Safety and Assessment Superintendent
- \*T. Beilman, I&C/Planning Superintendent
- J. Droste, Maintenance Superintendent
- T. Postlewait, Technical Superintendent, Engineering
- L. Matthias, Administrative Superintendent
- M. Horvath, Quality Assurance Supervisor
- D. Loope, Radiation Protection Supervisor
- E. Morse, Quality Control Supervisor
- A. Tetzlaff, Performance Engineer

The inspector also contacted a number of other licensee and contract employees and informally interviewed operations, maintenance, and technical personnel.

\*Denotes some of the personnel attending Management Interview on October 1, 1987.

### 2. Actions on Previously Identified Items

- a. (Closed) Confirmatory Action Letter (Item 315/87017-05; 316/87017-05): as described in Requalification Examination Report 50-315/OLS-87-01 dated September 22, 1987, the provisions of CAL-RIII-87012 and its Amendment were satisfied and verified, additional inspection was conducted, and arrangements have been made for longer term actions. See also Paragraph 10, "Training and Qualification".
- b. (Closed) Unresolved Item (315/85025-06): containment local leak-rate tests (LLRT) exceeding 0.6 L(A). This item had two attributes. First, Licensee Event Reports (LERs) based on high LLRT results have been repetitive. This indicated the licensee was not taking effective corrective actions on known "problem" valves. During this inspection, historic data compiled valve-by-valve was examined by the inspector. These data showed some notable successes in addressing repetitive failures - for example, chronic leakage of a number of non-essential service water isolation valves (several of which failed four of six tests from 1976 through 1982) has been eliminated with a design change. Replacements or design changes have been effective for other repetitive problems as well. The data also showed, however, that a mixed group of six Unit 1 valves had



consecutive failures in 1985 and in 1987. Five of these had at least one previous failure also. The licensee has a system and criteria for identifying "problem valves" which is evident in the record and which had already identified one of the current group for attention. The inspector concluded the licensee is aware of the potential for and significance of repetitive failures and has developed the means to identify and address them.

A second attribute of the LLRT issue had to do with quantification of leak rates not directly measurable during the LLRT. Further review on this question showed that, prior to and during 1983, no attempt was made to quantify leakage above instrumentation direct measurement capabilities. In the 1985 testing, "unmeasurable" leaks were calculated using a "choked flow" method. Conservative assumptions were imposed. During 1987 testing, larger ranged instrumentation was to be available so "unmeasurable" leak rates would not be documented. Licensee Event Report (LER) 315/87012, which remains open for further review, documents a single exception where, due to poor coordination, Maintenance personnel repaired leaky valves before a retest with larger-scale instrumentation could be performed.

The inspector concluded the licensee's program did not adequately address "unmeasurable" local leak rates in 1983 and prior years, but does so now. Considering integrated leak rate tests have been performed on both containments (Unit 1 - 1985; Unit 2 - 1984) subsequent to the pre-1983 period, the unrecoverable data are not critical to current program status and schedules.

- c. (Closed) Violation (315/87009-01): the temperature/pressure limits of Technical Specification Figure 3.4-3 were exceeded during a Unit 1 cooldown on April 8, 1987. The licensee's response (AEP:NRC:1029) dated June 19, 1987 describes corrective and preventive actions. These items were verified by the inspector.
- d. (Open) Open Item (315/87017-04; 316/87017-04): on August 3, 1987 a security force supervisor found what appeared to be a sleeping security officer. During this inspection the inspector and a member of the licensee management staff found an inattentive security officer (see Paragraph 8, "Security"). This item remains open pending review by Region III Security Specialists.

No violations, deviations, unresolved or open items were identified.

### 3. Operational Safety Verification

Routine facility operating activities were observed as conducted in the plant and from the main control rooms. Plant startup, steady power operation, plant shutdown, and system(s) lineup and operation were observed as applicable.



The performance of licensed Reactor Operators and Senior Reactor Operators, of Shift Technical Advisors, and of auxiliary equipment operators was observed and evaluated including procedure use and adherence, records and logs, communications, shift/duty turnover, and the degree of professionalism of control room activities.

Evaluation, corrective action, and response for off normal conditions or events, if any, were examined. This included compliance to any reporting requirements.

Observations of the control room monitors, indicators, and recorders were made to verify the operability of emergency systems, radiation monitoring systems and nuclear reactor protection systems, as applicable. Reviews of surveillance, equipment condition, and tagout logs were conducted. Proper return to service of selected components was verified.

- a. Unit 1 remained in an extended refueling, maintenance and testing outage throughout the inspection period, ending the period in startup activities (Mode 3) for return to service. See also Paragraph 9, "Outages".
- b. Unit 2 took early entry into a scheduled 40-day maintenance and testing outage (primarily steam-generator eddy current testing (ECT) and ice condenser surveillance) on August 26, 1987 at the beginning of the inspection period. The shutdown was precipitated "early" by a need to examine reactor coolant pump and CRDM hatch bolt discrepancies compared to original design. At the end of the inspection the Unit remained out of service as identified maintenance and testing (steam-generator manway bolt hole repairs were limiting) were being completed. See also Paragraph 9, "Outages".
- c. Routine tours, including weekly tours in company with senior plant management, were conducted. The Unit 1 and Unit 2 containment buildings, the auxiliary building, the electrical equipment rooms, both control rooms, the turbine building and the greenhouse were covered on the tours.

The tours identified the following:

- i) deteriorating floor covering material in the Unit 2 lower containment. Corrective action was initiated and completed before a MODE change. The plant was in MODE 5 at the time of the discovery. In addition, similarly degraded floor coating was observed in the Unit 2 upper containment by plant Quality Control Personnel who initiated corrective action.
- ii) inattentive security officer (see Paragraph 8, "Security")
- iii) lead shot leaking from a post accident sample sink. Discussions with Radiation Protection Personnel revealed that this item had previously been identified.



iv) a flash was observed in the Unit 1 fire pegging pump circuit breaker. The flash was reported to the Unit 1 control room. The inspector observed the licensee's response and followup action.

d. A continuing inspector review of corrective action documents called "Condition Reports" noted four items in early August, 1987, involving Operations Department equipment clearance or alignment problems. Further review disclosed the licensee properly escalated each item to "Problem Report" status. Discussions with licensee representatives further disclosed that errors of this type are entered in a trending program so potential negative trends can be caught and addressed quickly. This was discussed at the Management Interview (Paragraph 12).

No violations, deviations, unresolved or open items were identified.

#### 4. Radiological Controls

During routine tours of radiologically controlled plant facilities or areas, the inspector observed occupational radiation safety practices by the radiation protection staff and other workers.

Effluent releases were routinely checked, including examination of on-line recorder traces and proper operation of automatic monitoring equipment.

Independent radiation surveys, using a licensee provided E-130 survey meter, were performed in various radiologically controlled areas.

No violations, deviations, unresolved or open items were identified.

#### 5. Maintenance

Maintenance activities in the plant were routinely inspected, including both corrective maintenance (repairs) and preventive maintenance. Mechanical, electrical, and instrument and control group maintenance activities were included as available.

The focus of the inspection was to assure the maintenance activities reviewed 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 post maintenance testing was performed as applicable.

The following activities were inspected:

- a. Job Order JO 87P0062: Implement Procedure \*\*12MHP 5021.082.023, "Maintenance Inspection and Repair Procedure for Westinghouse Type DB-50 Air Circuit Breakers Installed as Reactor Trip Breakers and Reactor Trip Bypass Breakers".
- b. Request for change RFC-01-4087, "Delete BOP Loads From 250 VDC ESS Distribution Cabinets".

This activity was an "emergency" design change driven by discovery, during followup review of questions raised by a licensee-sponsored Safety System Functional Inspection (SSFI) that both trains of certain 250 VDC panels power both ESS and balance-of-plant (BOP) loads. Since BOP loads may not remain separate, a postulated failure mode was a BOP fault in excess of about 1500 amps which, considering lack of design coordination between the main feeder fuse (100 amp) and the component breakers (Heinemann 10 amp) could cause loss of both Train A and Train B ESS functions. Since one associated ESS function (main steam isolation valve fast closure) is "energize to actuate", loss of both trains renders that function inoperable. Both Units were shut down at the time of discovery. The referenced RFC rectified the situation for Unit 1 prior to startup. Any similar problem in Unit 2 will be addressed prior to startup of that Unit. A Licensee Event Report (LER) is currently anticipated on this matter which will be the subject of further review - likely by an NRC Region III electrical specialist.

- c. Job Order JO 717927: Implement Temporary Modification No. 154 involving change of power cable to 1E Containment Spray Pump (ECTS).

The licensee discovered, during investigation of an August 26, 1987 failure of the 1E centrifugal charging pump (ECCP) that the power cable to the pump had apparently been damaged by immersion/contamination with diesel fuel oil. The cable insulation deteriorated in a section running through an embedded conduit near the 1 AB emergency diesel generator oil sump pit. Three other "A Train" power cables utilize conduits in the same vicinity, including the 1E containment spray pump (ECTS). The licensee removed all four cables, cleaned their conduits and two "spares" and performed various tests in an attempt to determine the source of fuel oil intrusion. Two more conduits were found with apparent minor contamination. No specific source was identified, though drain testing proved inconclusive and the drains were isolated. Sampling was also done on "B Train" conduits but no contamination was found. New "A Train" cable was pulled, leaving the original ECCP and ECTS conduits as new "spares". These conduits are being monitored weekly by drawing a swab through and sampling for oil. The subject Job Order/Temporary Modification documents slightly different new cable used for the ECTS on restoration, and includes safety and technical adequacy evaluations.

- d. Job Order JO 012282: Repair leak in component coolant water (CCW) piping to 2 West Residual Heat Removal Heat Exchanger.

Inspection Reports No. 50-315/87023(DRS); No. 50-316/87023(DRS) addresses the overall CCW project, and determined the weld repair complies with the applicable Codes. Basically, the repair required the removal of an approximate two inch by five inch cutout from the piping and replacement with a patch of similar, but not identical material. The licensee will replace the patched section with new piping when it becomes available.

- e. The 1986 and 1987 Battery Maintenance history was reviewed and the two Job Orders listed below were selected to verify that applicable surveillance tests were performed.

- (1) Job Order JO 10569: Replace AB Battery Cell 59 with spare cell 7.

The quarterly surveillance requires that the as-found voltage has not decreased more than .05 volts from the value observed during the original acceptance test. The inspector verified that the surveillance test was changed to reflect the new cell original voltage value.

2. Job Order JO 15465: Jumpered cells 58, 59 and 60 to the Unit 2 "N" Train Batteries.

The inspector verified that the float and equalizing charge values were modified to reflect the deleted cells.

No violations, deviations, unresolved or open items were identified.

## 6. Surveillance

The inspector reviewed Technical Specifications required surveillance testing as described 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 properly 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 deficiencies identified during the testing were properly reviewed and resolved by appropriate management personnel.

The following activities were inspected:

- a. \*\*1 THP 4030 STP.080 "Instrument Checks Prior to Startup", Revision 7 (6/12/86) through Change Sheet 4 (4/23/87).

- b. \*\*12 THP 6040 PER.091 "Resistance Temperature Detector Bypass Loop Flow Verification", Revision 2 (8/20/87) through Change Sheet 1 (9/23/87).
- c. \*\*1 MHP SP.126 "Unit 1 Main Steam Safety Valve Setpoint Verification Using the Trevitest Equipment", Revision 0 (6/24/87). This activity was a restoration test for seven valves previously identified as needing rebuilding.
- d. \*\*1 OHP 4030 STP.053A "ECCS Valve Operability Test - Train A", Revision 1 (6/19/86).
- e. \*\*12 THP 4030 STP.205B "Engineered Safety Features Time Response Test - Train B"; Section 5.8 "Safety Injection", Revision 13 (6/11/87) through Change Sheet 4 (8/24/87).
- f. \*\*2 THP SP.002 "Wiss Janey, Elstner Associates Work Procedure for Hatch Cover Bolt Weld Data Collection", Revision 0 (9/22/87).

This test involved pulling reactor coolant pump No. 23 hatch cover bolts to assess their strength in an "as-found" condition different from that specified on design/installation drawings. See Paragraph 9, "Outages", for further details.

- g. 1 THP 4030 STP.204 "Unit 1 Containment Upper Airlock Test".
- h. 12 QHP 4030 STP.003 "Fireheader Stand Pipe Test".
- i. Surveillance procedures for the 250 volt station batteries were reviewed to verify that applicable Technical Specifications were implemented. The following procedures were reviewed:
  - i) \*\*1 MHP 4030 STP.042 "Quarterly Surveillance Test Procedure for Plant 1AB Batteries".  
Reviewed completed tests performed April 1987 and June 1987.
  - ii) \*\*2 MHP 4030 STP.045 "Quarterly Surveillance Test Procedure For 2N Train Battery."  
Reviewed completed tests performed March 1986, March 1987 and May 1987.
  - iii) \*\*12 MHP 4030 STP.013 "Weekly Surveillance Test Procedure for Plant Batteries 1AB, 1CD, 2AB, and 2CD."  
Reviewed five tests completed during 1987.

No violations, deviations, unresolved or open items were identified.



7. Fire Protection

Fire protection program activities, including fire prevention and other activities associated with maintaining capability for early detection and suppression of postulated fires, were examined. Plant cleanliness, with a focus on control of combustibles and on maintaining continuous ready access to fire fighting equipment and materials, was included in the items evaluated.

The licensee reported that a preplanned maintenance activity (valve replacement) required removal of a portion of the non-safety related fire suppression water system from service on August 31, 1987. Four hydrants within the protected area and two outside were isolated. Backup fire protection was available, as required, from remaining hydrants and additional fire hoses placed in the outside hose houses adjacent to the affected areas. Telephone and written notification requirements were met.

No violations, deviations, unresolved or open items were identified.

8. Security

Routine facility security measures, including control of access for vehicles, packages and personnel, were observed. Performance of dedicated physical security equipment was verified during inspections in various plant areas. The activities of the professional security force in maintaining facility security protection were occasionally examined or reviewed, and interviews were occasionally conducted with security force members.

- a. On September 1, 1987 while touring the plant with the Safety and Assessment Superintendent the inspector observed a security force guard stationed at the Unit 2 lower containment airlock in a position in which he appeared inattentive to his post. The matter was referred to Security Department supervision. The next day, the Administrative Superintendent informed the inspector that the security officer had been removed from duty pending further review. The officer was subsequently dismissed. As discussed in Paragraph 2.d, the inspector has included this item with an example from a previous inspection report for review by a Region III Security Specialist.
- b. On September 9, 1987 the Plant Manager informed the inspector that an employee had tested positive during the "Fitness For Duty" drug screening; the employee was dismissed. The inspector provided the available information to Region III for review by a Security Specialist.

No violations, deviations, unresolved or open items were identified.

9. Outages

- a. As noted above (Paragraph 3) Unit 1 remained in a scheduled refueling, maintenance and testing outage throughout the inspection period. The outage exceeded its scheduled duration during this period due to additions made to the outage scope and because of discovery of a need to perform previously unanticipated repairs. The inspector routinely attended meetings addressing outage status and plans and found decisionmaking relative to adding items to the outage list to be well-founded and conservative.

Prior to a Unit 1 Mode change from MODE 5 to MODE 4 the inspector verified that containment integrity was established as required by the Technical Specifications. The inspector verified the proper position of the valves associated with at least ten containment penetrations, observed that the Unit 1 upper airlock containment penetration was tested per plant procedure (see Paragraph 6.g) and that the ice condenser was maintained in accordance with Plant Procedures.

- b. Unit 2 entered an outage on August 26, 1987 which was precipitated by discovery the reactor coolant pump (RCP) hatch covers were bolted down with bolts not installed per design. An outage plan scheduled for October, 1987, was then implemented about a month early. Major activities were surveillance on the steam generator tubes (eddy-current testing) and on the ice condenser; and resolution of the hatch bolt problem. At the end of the inspection period the Unit remained out of service as needed repairs to bolts for one RCP hatch and to several steam generator manway bolt holes were being completed. Some preparatory tasks were performed during this outage to begin clearing the way for the planned replacement of the Unit 2 steam generators next year.

As noted above (Paragraph 6.f, "Surveillance") the inspector observed selected testing activities on RCP hatch cover bolts. These hatch covers serve as part of the divider barrier between upper and lower containment in the ice condenser design. As such, they must have adequate strength to hold pressure loading from postulated accidents. The discrepancies are believed to have occurred during original plant construction when, presumably, embedded studs did not match hatch cover stud-holes, so a number were cut off, moved into alignment, and welded to the steel seal channel. Inspection of the hatch covers is documented in Inspection Reports No. 50-315/87023(DRS); No. 50-316/87023(DRS).

No violations, deviations, unresolved or open items were identified.

10. Training and Qualification Effectiveness

For each area addressed in this report, which involved inspector observation of the conduct of activities and/or discussions with licensee



personnel, the inspector's evaluation included a judgement of the degree of knowledge or skill exhibited. No direct performance problems were noted.

NRC requalification examinations administered during the week of August 3, 1987, identified that 10 of 12 Senior Reactor Operators examined (83%) failed the test. During the week of September 8, a training inspection (IEIR 50-315/87027; 50-316/87027) changed the failure rate to 8 of 12 (67%).

Based on consultation with station management a Confirmatory Action Letter (CAL) CAL-RIII-87-012; Amendment 1, was issued on September 4, 1987.

The Confirmatory Action Letter had the following line items:

- a. In accordance with Requalification Program requirements, remove from licensed duties those individuals who failed the examinations.

(Closed) Confirmatory Action Letter Item (315/87024-01; 316/87024-01). The resident inspector verified that the operators identified by the telephone conference on September 8, had been removed from licensed duties. Requalification Examination Report 50-315/OLS-87-01 also states that the provisions of this line item were satisfied.

- b. Meet with the NRC at the Region III office to discuss the results of these examinations prior to criticality of either unit.

(Closed) Confirmatory Action Letter Item (315/87024-02; 316/87024-02). A management meeting was held in Region III on September 9, 1987, which addressed this line item.

Two Confirmatory Action Letter items and no violation, deviations, unresolved or open items were identified.

#### 11. Confirmatory Action Items

Confirmatory Action Letters (CAL) are letters confirming a licensee's agreement to take certain actions to remove significant concerns and are issued as soon as practical after identification of a significant condition that requires corrective action by the licensee. CAL items examined during this inspection are discussed in Paragraph 10. above.

#### 12. Management Interview

The inspectors met with licensee representatives (denoted in Paragraph 1) on October 1, 1987 to discuss the scope and findings of the inspection. In addition, the inspector asked those in attendance whether they considered any of the items discussed to contain information exempt from disclosure. No items were identified.

The following items were specifically discussed.

- a. The closure of an Unresolved Item relating to repetitive containment Local Leakrate Test (LLRT) failure (Paragraph 2.b).
- b. The occurrence of a "cluster" of four operational clearance or alignment errors in early August 1987. Licensee representatives confirmed this type of event is among those addressed in a specific trending program for early identification of adverse trends. Also, a quarterly summary report is prepared and distributed to Operations Department personnel covering lessons learned in reviewing such errors. The second Quarter 1987 Report was provided for inspector review. (Paragraph 3.d).
- c. Compliance to special reporting requirements on isolation of several fire header valves (Paragraph 7).
- d. Discovery of a security guard who appeared inattentive at his post (Paragraph 8).
- e. Followup on Confirmatory Action Letter CAL-RIII-87-012 and its Amendment 1 (Paragraphs 2.a and 10).