

U. S. NUCLEAR REGULATORY COMMISSION  
REGION III

Report Nos. 50-315/91027(DRP); 50-316/91027(DRP)

Docket Nos. 50-315; 50-316

License Nos. DPR-58; DPR-74

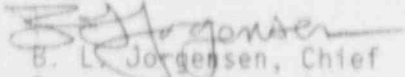
Licensee: Indiana Michigan Power Company  
1 Riverside Plaza  
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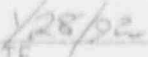
Facility Name: Donald C. Cook Nuclear Power Plant, Units 1 and 2

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

Inspection Conducted: November 27, 1991, through January 14, 1992.

Inspectors: J. A. Isom D. G. Passehl  
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DATE

Inspection Summary

Inspection from November 27, 1991, through January 14, 1992 (Report Nos. 50-315/91027 (DRP); 50-316/91027(DRP))

Areas Inspected: Routine unannounced inspection by the resident inspectors of: plant operations; maintenance and surveillance; safety assessment/quality verification; engineering and technical support; actions on previously identified items; security; reportable events; and, NRC Region III requests.

Results: No violations were identified in seven of the eight areas inspected. One violation (Level IV - failure to perform required evaluation to determine whether design changes involved an unreviewed safety question - Para. 5) was identified in the remaining area. The inspection noted strengths in the licensee's response to and repair of the leaking CCW heat exchanger. The inspection disclosed weaknesses in the licensee's implementation of the 10 CFR 50.59 review process.

Operations:

Units 1 and 2 operated routinely throughout the inspection period. Potential operational problems were encountered with a sticking Unit 2 feedwater regulating valve, a failed Unit 2 acoustic monitor for pressurizer safety valve SV-45C, and a leaking Unit 1 East CCW heat exchanger. All three problems were repaired or addressed satisfactorily.

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Maintenance and Surveillance:

Maintenance activities observed were performed satisfactorily and only minor documentation problems were noted.

Safety Assessment and Quality Verification:

The inspectors reviewed the licensee's conduct of safety reviews in accordance with 10 CFR 50.59 and concluded that the licensee had a good 10 CFR 50.59 review program. However, there were examples of modifications which did not receive required safety evaluations. Modifications were being screened out as not requiring safety reviews, even though they affected or had the potential to affect the function, performance, or means of operation of systems or components important to safety and described in the Final Safety Analysis Report.

## DETAILS

### 1. Persons Contacted

- \*A. A. Blind, Plant Manager
- \*J. E. Rutkowski, Assistant Plant Manager-Technical Support
- L. S. Gibson, Assistant Plant Manager-Projects
- K. R. Baker, Assistant Plant Manager-Production
- \*B. A. Svensson, Executive Staff Assistant
- T. K. Postlewait, Site Engineering Support Manager
- \*G. A. Weber, Plant Engineering Superintendent
- Y. P. Beilman, Maintenance Superintendent
- J. R. Sampson, Operations Superintendent
- G. A. Tollas, Acting Safety & Assessment Superintendent
- \*P. G. Schoepf, Project Engineering Superintendent
- L. H. Vanginhoven, Site Design Superintendent
- J. T. Wojcik, Chemistry Superintendent
- D. C. Loope, Radiation Protection Superintendent
- P. F. Carteaux, Training Superintendent
- M. L. Horvath, Quality Assurance Superintendent
- L. J. Matthias, Administrative Superintendent

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 the Management Interview on January 17, 1992.

### 2. Plant Operations (71707, 71710, 42700)

The inspector observed routine facility operating activities as conducted in the plant and the main control rooms. The inspector monitored performance of licensed Reactor Operators and Senior Reactor Operators, of Shift Technical Advisors, and of auxiliary equipment operators and evaluated their procedure use and adherence, records and logs, communications, shift/duty turnover, and the degree of professionalism of control room activities. The Plant Manager, Assistant Plant Manager-Production, and the Operations Superintendent were all well-informed on the overall status of the plant.

The inspector reviewed the licensee's evaluation of corrective action and response to off-normal conditions. This included compliance with any reporting requirements.

The inspector noted the following with regards to the operation of Units 1 and 2 during this reporting period:

- a. Unit 1 operated routinely at essentially 100 percent power throughout the inspection period, except as required for main turbine control valve testing.

- b. Unit 2 operated with no major problems throughout the inspection period. Main turbine control valve testing was performed with no significant problems. Reactor power was lowered to 90 percent on December 14, 1991, due to problems with a sticking feedwater regulating valve (2-FRV-210) for No. 21 steam generator. After performing a safety evaluation to ensure that no unreviewed safety questions would result from increased main feed pump discharge pressure, the licensee increased the discharge pressure of the main feed pumps and adjusted the feedwater differential pressure controller to allow the feedwater regulating valve to operate in a position which minimized sticking. The licensee satisfactorily returned the reactor to 100 percent power on December 21, 1991. Valve 2-FRV-210 is scheduled for refurbishment during the upcoming refueling outage, set to begin on February 21, 1992.
- c. On November 29, 1991, the licensee found a Component Cooling Water (CCW) leak of approximately one gallon per minute to the Essential Service Water (ESW) System. The leak was discovered when operators noticed a level drop in the Unit 1 CCW Surge Tank. The leak was traced to a tube in the Unit 1 East CCW Heat Exchanger (HX). Operator immediate actions were good as they decreased the magnitude of the leak to about 0.2 gallons per minute. This was done by increasing CCW flow through the CCW HX to decrease the pressure differential between ESW and CCW systems. The licensee isolated and plugged the leaking tube on December 2, 1991. The East CCW HX was satisfactorily returned to service the following day.

The licensee determined that the amount of radioactive material released was below Technical Specification limits based on measured activity of the CCW system.

The tube leak occurred near the baffle plate inside the HX. Water flow turbulence caused the tube to rub against the baffle plate which eventually lead to a leak. Erosion and Corrosion (E/C) and Microorganic Induced Corrosion (MIC) were also considered as factors in the root cause investigation. Although there was evidence of MIC, there was no evidence of E/C. Followup actions were initiated by the plant Maintenance Department to identify any problem areas in all four CCW heat exchangers. The CCW heat exchangers are being monitored for leakage until the onset of refueling outages (scheduled during 1992 for both units) when leak and eddy current inspections are scheduled to be performed.

- d. The licensee issued "Criteria For Conducting Infrequently Performed Tests or Evolutions," PMI-4090, Rev. 0, 1/8/1992. This Plant Manager Instruction (PMI) established criteria for conducting infrequently performed tests or evolutions which may affect plant operation or reactor safety.

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

3. Maintenance/Surveillance (62703, 61726, 42700)

The inspector reviewed maintenance activities as detailed below. The focus of the inspection was to assure the maintenance activities 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.

On December 11, 1991 the inspector observed the installation of pilot-operated valves (POVs) 1, 2, 3, and 4, and pressure regulating valves (PRVs) 1, 2, 3, and 4, for the Unit 2 "CD" and the Unit 1 "AB" Emergency Diesel Generators (EDGs). The inspector found that for both jobs, the work was performed by qualified workers, in accordance with approved instructions, and the installation was performed in a quality manner. Interdepartmental coordination weaknesses identified during an earlier inspection appeared to have been corrected. However, some documentation deficiencies were noted on the job order packages for both EDGs. Job Orders B35649, B38508, and B38509 documented the work performed on 2 CD EDG; A23406, A23407, and A42562 documented the work on 1 AB EDG. The following deficiencies were noted:

Job Order No. The result of a leak check performed on PRV-4 was not documented on the job order nor on the Technical Specification and Testing (TST) form.

Job Order Nos. Functional testing requirements found in applicable B38508, B38509 procedures ("Maintenance Testing and Inspection A23406, A23407 Instruction," MHI-2293, Rev. 0, January 19, 1989, Attachment No. 1, and "Emergency Diesel Generator Test (Train A)," \*\*2 CHP 4030 STP.027CD, Rev. 6, October 5, 1991) were not specified in the "Test or Inspection" required column of the TST form. (Attachment No. 1 of MHI-2293 specified the inspection and acceptance criteria for performing visual inspection of leaks in components.)

Job Order B35649 MHI-2293 Attachment No. 1 and \*\*2-DHP 4030 ST.027CD were not specified in the "Test or Inspection" required column of the TST form. (This JO was issued to allow replacement of PRVs 1, 2, 3, and 4, in conjunction with the modification work associated with POVs 1, 2, 3, and 4.)

The inspector checked whether the Worthington vendor drawings were updated to reflect the new valve part numbers, and found that they were not yet updated. The licensee stated the drawings would be updated prior to complete closeout of the modification packages.

Based on the review of the emergency diesel generator post-maintenance operability tests, and discussion of those tests with the Project Engineer, the inspector considered the discrepancies to be only documentation deficiencies which did not affect the operability of 2CD or 1AB Emergency Diesel Generators.

The licensee replaced the EDG starting air components due to problems experienced with incomplete starts, as described in NRC Inspection Reports 50-315/91017(DRP); 50-316/91017(DRP).

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

#### 4. Engineering and Technical Support (37828)

The inspector monitored engineering and technical support activities at the site and as provided to the site from the corporate office. The purpose of this monitoring was to assess the adequacy of these functions in contributing properly to other functions such as operations, maintenance, testing, training, and configuration management.

- a. The inspector reviewed an event which occurred on December 23, 1991, in which a plant operator found during a walkdown of the Auxiliary Building that the control switch for the Unit 1 "A" Train feed to the "N" Train battery charger was not inside a designated vital area. The inspector reviewed the problem to determine the impact, if any, on operability of the "N" Train battery and agreed with the licensee's preliminary assessment that there was no immediate operability concern.

The licensee concluded that the control switch being outside the vital area would not impact on the ability of the "N" battery to function in its design requirements for the following reasons:

- The "N" Train battery was sized and tested to assure that it can supply the required DC loads for its four-hour rating without the utilization of battery chargers.
- Any act of tampering with the controls of the in-service battery charger that resulted in it being removed from service would annunciate an alarm in the control room.
- In the event of a safety injection or a station blackout, the in-service battery charger would automatically be de-energized. Manual operator action is required to return it to service.

The function of the 250 volt "N" Train battery system is to supply necessary DC power to valves and controls to allow the turbine-driven auxiliary feedpump (TDAFP) to function when the main feedwater system is not in service. The "N" Train battery system consists of two independent and redundant battery chargers, a 250 volt battery, and a distribution system.



Weaknesses:

The 10 CFR 50.59 classroom training could be replaced with what appeared to be a "required reading list" for those individuals working at the corporate office. The inspector believed that this form of training would be far less beneficial than training with an instructor.

Lack of a written examination for corporate screeners upon completion of training.

Currently, the periodic retraining requirement for those performing the 10 CFR 50.59 reviews is every 3 years.

The inspector also reviewed approximately 40 Requests For Change (RFCs), Minor Modifications (MMs), Plant Modifications (PMs), and Temporary Modifications (TMs) to determine whether these modifications were properly screened and evaluated in accordance with the licensee's requirements. The following examples were identified wherein modifications were screened out as not requiring safety reviews, even though they affected or had the potential to affect the function, performance or means of operation of systems or components important to safety and described in the Safety Analysis Report.

- RFC-2900 Added reactor coolant system wide-range temperature recorders to safety-related sources.
- RFC-3053 Installed two new Reactor Coolant System wide-range pressure indicators on the control room panel.
- RFC-3071 Increased the sensitivity of the power-range nuclear instrumentation by installing two potentiometers and one resistor.
- MM-019 Removed internal parts from emergency diesel generator air start check valves.
- MM-095 Modified the reactor trip and bypass breaker cabinets by installing volt-meters in order to identify possible failure of the P-4 contacts. The P-4 contacts actuate a turbine trip, upon a reactor trip.
- MM-176 Modified the "sneak circuit" motor driven auxiliary feedwater pump circuitry, which was causing the pump to load onto the diesel generator out of sequence.

Each of the modifications listed represented potentially significant changes to the facility design or operation and as such the modifications qualified for a safety evaluation. The failure to determine whether the modifications involved an unreviewed safety question is contrary to 10 CFR 50.59 and is inconsistent with existing plant procedures. This is considered a violation as described in the enclosed Notice (Violation 315/91027-01; 316/91027-01).



The inspector also noted a weakness in the tracking and closeout of open items identified during the safety evaluation reviews of modification packages. It was not clear to the inspector through review of licensee documents and interviews with personnel that the open items identified for resolution were reviewed for adequacy or completion by either the lead engineer or the oversight groups once they were assigned for resolution by the Plant Nuclear Safety Review Committee (PNSRC). For example, minor modification 02-MM-166 had four open items that were identified in the safety evaluation. However, followup of the open items was not evident, nor did it appear that the appropriate onsite and offsite safety review committee oversight was performed on the open item resolution, as it would have been for the initial package. Further, it could not be determined by the inspector through review of licensee records that one of the four open items, which involved an analysis to determine whether implementation of 02-MM-166 would result in radiological hot spots, was ever addressed. The analysis to determine whether 2-MM-166 would create undesirable radiological hot spots is considered an open item (Open Item 315/91027-02; 316/91027-02).

Discussion with Nuclear Safety and Licensing personnel indicated that only resolution of open items for RFCs were forwarded to the lead engineer for review. For MMs, PMs and TMs, the resolution of open items were not required to be sent to the lead engineer. The licensee indicated to the inspector that they would revise procedures to provide a copy of all open item resolutions for MMs, RFCs, PMs and TMs to both the lead engineer and the oversight review groups.

Additionally, the inspector noted the following discrepancies:

- a. Three of the 10 procedure changes reviewed were not properly screened in that the explanation used in answering "no" to screening questions was not provided in accordance with the "Safety Evaluation Screening" procedure, PMP 1040.SES.001. The three procedures were 01-OHP 4023.ECA-1.1, "Loss of Emergency Coolant Recirculation," Rev. 2, 6/6/1989; 02-OHP 4023.FR-5.1, "Response to Nuclear Power Generation/ATWS" Rev. 3, 11/19/1991; and, 01-OHP 4024.105, "Annunciator No. 105 Response: Containment Spray," Rev. 5, 11/27/1991.
- b. The inspector could not verify that analysis (to consider radio frequency interference as a failure mode for the reactor protection system H-line replacement) was completed as stated in the "USQ safety evaluation." The result of the radio frequency analysis is an open item (315/91027-03; 316/91027-03).
- c. Although required by the "Safety Evaluation Screening" procedure, no system existed for easily identifying, sorting, and listing commitments to the NRC to ensure that all commitments relating to a proposed modification could be evaluated in the screening process.

Lastly, the inspector believed that periodic licensee audits of its 10 CFR 50.59 process would be highly desirable. The PNSRC provided this oversight in the past but a recent change to the Technical Specifications no longer requires the PNSRC to perform this function. Periodic audits of the 10 CFR 50.59 process could minimize instances in which required safety reviews were missed, as well as enhance the quality of the overall 10 CFR 50.59 process. The licensee committed to consider this as a possible QA function in the future.

One violation and two open items were identified in review of this area. No deviations or unresolved items were identified.

6. Reportable Events (92700, 92720)

The inspector reviewed the following Licensee Event Reports (LERs). The review addressed compliance to reporting requirements and that immediate corrective action and appropriate action to prevent recurrence had been accomplished.

- a. (Closed) LER (316/88003-08) Repetitive violation of RPS instrument tolerances (undervoltage relays) due to highly restrictive allowable values. This LER and its eight revisions were reviewed, along with Amendment Numbers 137 and 140 to the Facility Operating License, issued May 25, 1990. These amendments raised the trip set points and increased the span of allowable values for the 4KV Bus Loss of Voltage and 4KV Bus Degraded Voltage actuation relays. The inspector also verified that the subject relays were replaced with more accurate undervoltage relays during the subsequent refueling outages. To accomplish this replacement, modification RFC-DC-12-3005 was used and completed for Unit 2 on September 15, 1990, and Unit 1 on December 18, 1990. This LER is closed.
- b. (Closed) LER (316/89017-04) Loss of Turbine Driven Auxiliary Feed Pump (TDAFP) flow retention due to inaccurate flow measurement. This LER and its four revisions were reviewed. In addition, the inspector reviewed an April 30, 1991, engineering evaluation, made an independent evaluation of the situation, and discussed the course of action with the System Engineer. The problem appears to be caused by fluid dynamic perturbations which are unique to Unit 2. The long term fix may be to move the location of the orifice plate to a point in the discharge piping in which there is a 20 foot section of straight pipe. Before that occurs, a replacement orifice of a smaller orifice bore (3.050 inches vice 5.062 inches) will be tested during the upcoming refueling outage. One difference that exists between Unit 2 and Unit 1 TDAFPs is the orientation of the discharge check valves (FW-135). Unit 2 has this valve at 90 degrees from the valve in Unit 1. The inspector suggested a method to judge the effect of this different

orientation that the licensee had not yet previously considered. The licensee indicated that if the smaller orifice bore does not solve the problem, then they would consider the suggestion to test the system with the internals of the check valve removed. The results of these changes will be reviewed during a future inspection and are an open item (Open Item 316/91027-04). This LER is closed.

- c. (Closed) LER (316/89019-LL) Unit vent continuous sample flow not obtained for twenty minutes due to failure of backup sample pump. This event appears to be an isolated case and corrective action appears adequate. This LER is closed.

One open item and no violations, deviations, or unresolved items were identified.

#### 7. Region III Requests (92705)

On December 20, 1991, the inspector held a special meeting with the plant manager to ensure the licensee was fully informed about an event at Detroit Edison's Fermi 2 Plant. A crane inadvertently contacted an overhead electrical power line. The seriousness of the event was firmly emphasized to the Plant Manager.

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

#### 8. 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 discussed in Paragraphs 5 and 6.

#### 9. Management Interview

The inspectors met with licensee representatives (denoted in Paragraph 1) on January 17, 1992, to discuss the scope and findings of the inspection. In addition, the inspector also discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspector during the inspection. The licensee did not identify any such documents or processes as proprietary.