

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-315/89008(DRS); 50-316/89008(DRS)

Docket Nos. 50-315; 50-316

Licenses No. DPR-58; DPR-74

Licensee: Indiana Michigan Power Company
1 Riverside Plaza
Columbus, OH 43216

Facility Name: D. C. Cook Nuclear Power Station, Units 1 and 2

Inspection At: Bridgman, Michigan
U. S. Nuclear Regulatory Commission, Region III

Inspection Conducted: February 6-10, 28, and March 7, 1989

Inspector: I. T. Yin *I. Yin*

3/21/89

Date

Approved By: *Monte P. Phillips*
Monte P. Phillips, Chief
Operational Programs
Section

3/21/89

Date

Inspection Summary

Inspection on February 6-10, 28, and March 7, 1989 (Reports No. 50-315/89008(DRS); No. 50-316/89008(DRS))

Areas Inspected: Routine, announced inspection of licensee corrective actions for the issues identified in its self-initiated Safety Systems Functional Inspection (SSFI) of the Auxiliary Feed Water (AFW) system. The inspection was based on selected portions of NRC Inspection Procedures 90713, and 30703.

Results: Licensee effort in conducting the SSFI for the AFW system, and followup on the issues identified was good. Based on this review and evaluation, the inspector provided the following observations:

- The SSFI review scope was extensive.
- The licensee has been very responsive to the issues raised in the SSFI, although in some cases, the licensee was not attentive to technical details contained in the SSFI findings.
- The licensee's present design control measures continue to be inadequate.

During the NRC management meeting held with the licensee in NRC Region III office, the licensee stated that their next in-depth engineering oriented evaluation will be on design control processes.

DETAILS

1. Persons Contacted

Indiana and Michigan Electric Company

- *W. G. Smith, Jr., Plant Manager
- K. R. Baker, Operations Superintendent
- T. Postlewait, Technical-Engineering Superintendent
- G. Costello, Administration Compliance Coordinator
- *D. Krause, Production Control Supervisor
- *J. E. Rutkowski, System Plant Manager-Production
- *J. B. Droste, Maintenance Superintendent
- *R. T. Rickman, Project Manager of Reliability Centered Maintenance
- J. R. Sampson, Safety and Assessment Superintendent
- *L. S. Gibson, Assistant Plant Manager
- +*B. A. Svensson, Licensing Action Coordinator

American Electric Power Service Corporation

- +D. Kruer, Manager, Quality Engineering
- +*M. S. Ackerman, Engineer, Nuclear Safety and Licensing (NS&L)
- +*P. G. Schoepf, Engineer, Nuclear Engineering Department (NED)
- +°*K. J. Munson, Electrical Engineer, NED
- +°*R. G. Vasey, Engineer, NS&L
- +S. J. Brewer, Manager, NS&L
- *S. J. Wolf, QA Auditor
- K. R. Worthington, Senior QA Auditor
- °M. Finissi, Electrical Engineer
- °R. Shoberg, Section Manager, Technical Support
- °R. Leonard, Engineer, Nuclear Fuels

U. S. Nuclear Regulatory Commission

- +H. Miller, Director, Division of Reactor Safety (DRS)
- +W. Shafer, Acting Deputy Director, DRS
- +R. Cooper, Chief, Engineering Branch, DRS
- +M. Phillips, Chief, Operational Programs Section, DRS
- +R. Gardner, Chief, Plant Systems Section, DRS
- +D. Danielson, Chief, Materials and Processes Section, DRS
- B. Jorgensen, Senior Resident Inspector
- *D. Passehl, Resident Inspector

*Indicates those attending the exit meeting at D. C. Cook Plant on February 10, 1989.

°Indicates those attending the working meeting in Region III on February 28, 1989.

+Indicates those attending the management meeting in Region III on March 7, 1989.

Other licensee personnel were contacted as a matter of routine during the inspection.

2. Introduction

The purpose of this NRC inspection and the management meeting held on March 7, 1989, was to evaluate the adequacy of licensee corrective actions for the issues identified during the SSFI, and assess the effectiveness of the corrective actions taken.

The licensee contracted Westec, a Division of ERC Corporation, to develop The SSFI program. The Auxiliary Feedwater system (AFW) was selected to be the first system receiving the SSFI. The SSFI team was composed of six Westec staff, and two staff from SIMCO, another Division of ERC Corporation. The inspection was conducted on July 6 through August 17, 1987 with the Westec report being issued on October 5, 1987. The licensee formally responded to the SSFI findings on November 18, 1987.

The NRC inspector reviewed the Westec report and the licensee responses in the Region III office, and concluded that the scope of the SSFI was extensive, and the SSFI was conducted in a professional manner. Furthermore, the licensee has been very responsive to the issues raised in the SSFI.

3. Site Review Sample Selection

The inspector reviewed the findings associated with the electrical, instrumentation, and operations areas listed below:

- SFK-1, Error in motor data resulting in incorrect required instantaneous relay setting for West Motor Driven Auxiliary Feedwater Pump.
- SFK-2, Inadequate 1-AB Battery Capacity at Minimum Design Temperature.
- SFK-3, Potential for undetected damage to valve motors and inadequate overload protection provided by vendor for FMO-221 and FMO-231.
- SFK-4, Battery Technical Specification Surveillance.
- SFK-5, Inadequate voltage rating of the East Motor Driven Auxiliary Feedwater Pump.
- SFK-6, Lack of battery room low temperature alarm for 1-AB and 1-CD batteries.
- SFK-7, Technical errors in safety review memorandum RFC DC-12-2934.
- SFK-8, Potential for common mode failure fo 250 VDC circuit breaker panels.

- SFK-9, Failure to evaluate the consequences of a partial implementation of design change to ensure successful starting of ESS motors.
- SFK-10, Inadequate motor overload protection in accordance with licensing commitment on conformance with Regulatory Guide 1.106, Regulatory Position C(2), and lack of design basis documentation to support 200% overload protection for motor operated valves.
- SFK-11, Inadequate protective device coordination on safety-related 250 VDC system.
- SFK-12, Lack of documentation on PJC relay setting of safety-related breaker T11A2, West Motor Driven Auxiliary Feedwater Pump Motor.
- SFK-13, Difference in overload relay heater coil selection data between RFC-12-2180 and RFC-12-2903.
- SFK-14, Valve nameplate data differences in design data resulting in drawing inconsistencies and incorrect overload relay heater coil selection.
- RBP-1, Instrumentation errors are not considered in calculating setpoints for alarms and controls.
- RBP-2, The Technical Specification requirement to have a minimum contained volume of 175,000 gallons of water is not in addition to the amount of water available at the CST Lo Lo Level alarm.
- RBP-3, The design control process for preparation, checking and verification of design calculations needs to be improved.
- RBP-4, Documentation of safety review evaluation procedure for 10 CFR 50.59.
- MB-1, A weakness was observed in some of the procedures to mitigate the potential for steam binding.
- MB-2, Information for setting the turbine driven auxiliary feedwater pump controller to rated flow is not available at the Hot Standby Panel.
- MB-3, Void.
- MB-4, Procedure Inconsistency.
- MB-5, Training matter, not reviewed.
- MB-6, Inconsistency on engineering units stated in various procedures for Condensate Storage Tank Level.

4. NRC Inspection Approach

After a preliminary review of the SSFI findings and the licensee's responses, the inspection of licensee corrective actions was implemented as follows:

- a. Attention was focused on significant safety issues for which the licensee had committed hardware fixes, operational revisions, or maintenance and/or testing upgrades (SFK-2, 6, 8, 11, and 12; RBP-1).
- b. Discussions were held on those findings the licensee had taken issue with (partial or complete disagreement). The rationale and technical bases for the exceptions were reviewed and evaluated (SFK-3, 4, 5, 9, 10 and 13; RBP-2).
- c. The inspector briefly reviewed findings which were programmatic and non-vital to system operations (SFK-1, 7, and 14; RBP-3, and 4; MB-1, 2, 4, and 6) and noted that in some cases they discussed specific safety issues that were among the apparent findings (see Paragraphs 6.a(5) and 8.a).

5. Licensee Corrective Action Strengths

The inspector observed the following licensee corrective actions which can be interpreted to be strengths within its corrective program:

- a. The SSFI findings were treated the same as Nuclear Safety and Licensing (NS&L) findings. The inspector considered: (1) The licensee responses to be extensive, (2) the responsible technical staff to be competent, and (3) the licensee management involvement in resolving the SSFI findings to be adequate.
- b. A number of significant corrective actions had been taken by the licensee, such as:
 - (1) (SFK-2, and 6) Heating for some of the battery rooms was improved and a re-analysis was performed for battery sizing to ensure sufficient power supply under the worst case load profile and temperature condition.
 - (2) (SFK-8, and 11) Extensive protective devices (such as relays and fuses) coordination studies were performed for 4 kV, 600 V, 480 V, 250 Vdc, and 120 Vac systems.
 - (3) (SFK-8, and 11) Reviews were conducted to determine the effects of a fault on Balance of Plant (BOP) circuits which share the same breaker panels with the Class 1E systems. The review concluded that faults on these BOP circuits would not affect Class 1E system single failure criteria.
 - (4) (SFK-11, and RBP-1) Recording of instrument setpoints was being conducted through walkdown verification. The collected data, and the parameter accuracies will be utilized when performing an instrument loop sensitivity study.
 - (5) (RBP-1) The interface between the licensee and Westinghouse on matters such as primary instrument changeouts and secondary system modification that could affect primary system control and protection functions appeared to be stringent and systematic.

- (6) (RBP-2) More accurate volume calculations were performed for Condensate Storage Tanks (CSTs) 1-TK-32, and 2-TK-32 to improve design basis documentation.
- (7) (SFK-1) Specific instruction was given to the staff to use Motor Operated Valve (MOV) name plate information (not to use design parameter estimates) for overload heater setting selections.

6. Licensee Corrective Action Weaknesses

The inspector identified some potential weaknesses within the licensee's corrective program/actions.

- a. The licensee's technical staff was not very attentive to some of the SSFI finding details; for example:
 - (1) The basis of instrument error band stated in IO No. RBP-1 was unknown.
 - (2) (RBP-1) although the SSFI team stated that the 20 minutes provision for the operator to switch to an alternate water supply source following a CST Lo-Lo level alarm was in addition to the existing nine hours water supply for Mode 3 operation, the basis could not be determined.
 - (3) The calculated CST volumes for various functions documented in IO No. RBP-1 could not be verified.
 - (4) The SSFI team basis of using the absolute sum method in instrument setpoint calculation as shown in IO No. RBP-1 was unknown.
 - (5) The leaking check valve (No. 2-FW-138-1) problem stated in IO No. MB-1 was not actively investigated by the licensee staff to prevent recurrence.
- b. The licensee staff was not very cautious in setting up design control for some technical evaluations; for example:
 - (1) No formal design specifications or instructions were provided to Impell (contractor), for performing protective devices coordination, and Class 1E and BOP system interface studies (refer to Paragraph 5.b(2) and (3)).
 - (2) There was a lack of documented design criteria including bases and methodology, for the present licensee instrument loop sensitivity study (refer to Paragraph 5.b(4)) and setpoint calculations.

During the management meeting held in NRC Region III office on March 7, 1989, the licensee stated that their next in-depth engineering oriented evaluation will focus on the design control processes.

7. SSFI Findings With Which the Licensee Disagrees

The inspector discussed with the licensee those SSFI findings with which they took issues. The inspector reviewed the SSFI team bases and the licensee rationale and responses and made the following determinations:

- a. (SKF-3 and 10) The present licensee overload protection for MOV motors met the intent of Regulatory Guide 1.106. The 200% full load amperage setpoint will prevent spurious MOV trips, and will protect the power supply bus, but will not protect MOV operator motor wiring from overload damage.
- b. (SFK-4) The existing Technical Specification (TS) surveillance requirement for diesel inverter load was adequate.
- c. (SFK-5) The licensee's technical evaluation of the east motor driven auxiliary feedwater pump operation under degraded voltage condition was adequate.
- d. (SFK-9) The control of Temporary Modifications (TMs) had been improved. The listing of open TMs showed adequate control being given to the items.
- e. (SFK-13) The licensee's design and selection of circuit breaker heater coils was adequate.
- f. (RBP-2) During the inspection, the licensee committed to request: (1) its Nuclear Safety and Design Review Committee to formally document its licensing interpretation that the 20 minutes provision for switch-over to an alternate water supply source following a CST Lo-Lo level alarm is included in the nine hours Mode 3 AFW operation, and (2) its Plant Nuclear Safety Review Committee to determine whether this design basis reconstitution will result in any TS revisions.

8. Conclusion

The inspector concluded that the licensee's effort in followup of its SSFI findings was extensive and effective. There were only a few weaknesses identified, as discussed in Paragraph 6, which should be reviewed and corrected as warranted.

9. Management Meetings

a. Exit Meeting at Site

The inspector met with licensee representatives (denoted in Paragraph 1) on February 10, 1989, at D. C. Cook Nuclear Power Station, and summarized the purpose, scope, and findings of the inspection. The inspector discussed the likely informational content of the inspection report with regard to documents reviewed by the inspector during the inspection. The licensee did not identify any such documents as proprietary.

b. Meeting in Region III Office

The NRC management met with the licensee in NRC Region III on March 7, 1989, to discuss the SSFI scope, methodology, implementation, findings, and corrective program. Specific details were discussed relative to hardware and system problems, such as protective relay coordination, and BOP connection to Class 1E circuit panel that had affected single failure criteria. The licensee stated that their next in-depth engineering oriented evaluation will be on design control processes (refer to Paragraph 6.b).

MAR 23 1989

Indiana Michigan Power
Company

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Distribution

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Licensee: INDIANA MICHIGAN POWER COMPANY 1 RIVERSIDE PLAZA COLUMBUS, OH 43216	Draft Completion Date: _____	Report No(s): 50-315/89008 (DRS) 50-316/89008 (DRS)
Facility(s): D. C. COOK NUCLEAR POWER STATION UNITS 1 AND 2	Initial Typing: _____	Inspection End Date: <i>Mar. 28, 1989</i> Feb. 28, 1989
	License No(s): DPR-58; DPR-74	Received Start End *Inspector Review: Start _____ End _____
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Review Process **

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<i>Draft</i>	<i>3/15</i>	<i>3/16</i>	<i>3/16</i>	<i>3/17</i>	<i>3/17</i>	<i>3/20</i>							<i>3/15</i>	<i>3/15</i>

NOTES **

Note No.	Comment

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Proprietary Review Notif. Telephone

Written Due Received

Licensee Response: Due Issued Received

Thank You Letter: Due Issued

Form 591 Applicable? Yes No

Issued From: Field Office

*Resident Inspectors Only

**Use Reverse to Add Additional Reviewers or Notes

INSPECTOR'S REPORT
Office of Inspection and Enforcement

FIN, ISA T.
REVIEWER
M.P. Phillips

INSPECTORS

LICENSEE/VENDOR: Indiana Michigan Power Co.
TRANSACTION TYPE: I - INSERT
DOCKET NO. 18 digit OR LICENSE NO. (BY PRODUCT) (13 digit): 05000315, 05000316
REPORT NO. 89008, SEQ. A, B, C, D
NEXT INSP. DATE: MO., YR.

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ORGANIZATION CODE OF REGION/HQ CONDUCTING ACTIVITY: REGION 3, DIVISION 3, BRANCH 2

REGIONAL ACTION: 1 - NRC FORM 591, 2 - REGIONAL OFFICE LETTER
TYPE OF ACTIVITY CONDUCTED: 02 - SAFETY, 03 - INCIDENT, 04 - ENFORCEMENT, 05 - MGMT. AUDIT, 06 - MGMT. VISIT, 07 - SPECIAL, 08 - VENDOR, 09 - MAT. ACCT., 10 - PLANT SEC., 11 - INVENT. VER., 12 - SHIPMENT/EXPORT, 13 - IMPORT, 14 - INQUIRY, 15 - INVESTIGATION

INSPECTION/INVESTIGATION FINDINGS: 1 - CLEAR, 2 - VIOLATION, 3 - DEVIATION, 4 - VIOLATION & DEVIATION
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ENFORCEMENT CONFERENCE HELD: A, B, C, D
REPORT CONTAIN 2,790 INFORMATION: A, B, C, D
LETTER OR REPORT TRANSMITTAL DATE: MO. 01, DAY 3, YR. 23/89

MODULE INFORMATION table with columns: REC-ORD, MODULE NUMBER INSP., MODULE REQ. FOLLOWUP, REC-ORD, MODULE NUMBER INSP., MODULE REQ. FOLLOWUP. Includes handwritten entries for 'Ent. & Exit Mtgs.' and 'Followup licensee's SSFI findings'.

* CIRCLE SEQUENCE IF VIOLATION OR DEVIATION

INSPECTION PLANNER

05000315/89008

Facility: D.C. Cook 1#2 Inspection Report No.: 05000316/89008
 Inspection Date(s): 2/6-10/89 Resident Notified: 1/31/89
 Inspection Type: Routine Reactive Team Allegation
 Other (specify) _____
 Announced Unannounced
 SALP Weaknesses addressed N/A

Inspection Focus (SALP Weakness, Core Program, Regional Initiative, Event Followup)	Module/TI No.	SALP Area/ Rating	Open Item No. (OIL)
Regional Initiative :	90713	E/T S	None
Followup Licensee Corrections on issues identified in its self-initiated SSFI type inspections performed on AFW system.			
Entrance & Exit Interview	30703	--	--

Plan Prepared By: [Signature] Date: 1/31/89
 Lead Inspector
 Plan Approved By: [Signature] Date: 2/1/89
 Section Chief
 Plan Reviewed By: [Signature] Date: 2/1/89
 Project Section Chief