U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-315/91006(DRS); 50-316/91006(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

Inspection Conducted: March 4-8, and 11-14, 1991

Inspector: C Vanderneit for I. T. Yin 3/29/91 Date

Approved By: C. Vanderneit, Chief Operational Programs Section 3/29/91 Date

Inspection Summary

Inspection on March 4-8, and 11-14, 1991 (Report No. 50-315/91006(DRS); No. 50-316/91006(DRS).

Areas Inspected: Routine, announced, safety inspection of system modifications and design changes implemented in recent years (IP 37700).

Results: Of the five permanent modifications, one minor modification, and two temporary modifications reviewed and observed, it was determined that corporate design and site technical staff interfaces need improvement. Furthermore, written justification needs be provided for 10 CFR 50.59 applicability and safety evaluation screening. One violation (with four examples) was identified for failure to conduct adequate design interface, and for the failure of design control to ensure proper functional test verification was performed in accordance with 10 CFR 50, Appendix B, Criterion III requirements.

DETAILS

1. Persons Contacted

Indiana Michigan Power Company (IMP)

*M. P. Alexich, Vice President, Nuclear Operations
*A. A. Blind, Plant Manager
*K. Baker, Assistant Plant Manager
*L. Gibson, Assistant Plant Manager
*J. Rutkowski, Assistant Plant Manager
*T. Postlewait, Project Engineer Superintendent
*J. Wojcik, TPS Superintendent
*B. A. Svensson, Licensing Action Coordinator
*S. DeLong, Project Engineer Supervisor
*E. Trader, Project Engineer
*J. Kauffman, Construction Manger
*M. Barfelz, Senior Engineer, Safety and Assessment
*A. Lofti, Site Design Engineer
A. Puplis, Senior Performance Engineer
J. Rischling,Plant Engineer
R. Allen, Maintenance Regulation Supervisor
J. E. Hylok, Scheduling Supervisor
M. Michaelson, System Engineer
R. Burgett, Chemistry Supervisor
C. Flis, HVAC System Engineer
T. Langlois, Project Engineer

American Electric Power Service Corporation (AEP)

*S. J. Brewer, Nuclear Safety and Licensing (NS&L) Manager
*T. Stayan-Sharma, Principal Engineer, NS&L
*P. Schoepf, Nuclear Engineer
*M. Sanghari, HVAC Engineer
*S. J. Wolf, Senior QA Auditor
*M. Ackerman, Engineer, NS&L
J. Markham, I&C Engineer
U. Dave, Engineer, Safety and Assesssment
J. Kingseed, Senior Engineer, NS&L
R. Simms, Senior QA Engineer
L. H. VanGinnoven, Site Design Supervisor
R. F. Kroeger, Manager, Electrical Systems Division

U. S. Nuclear Regulatory Commission (NRC)

*J. A. Isom, Senior Resident Inspector
D. Passehl, Resident Inspector

*Indicates those attending the exit meeting at D. C. Cook Plant on March 14, 1991.

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

2. Request For Change (RFC)

The inspector selected three permanent system modifications (RFCs) for detailed technical reviews, and two RFCs for additional review of 10 CFR 50.59 evaluations.

a. RFC DC-12-2760

This RFC replaced the EDG room ventilation system, supply damper, motor-operated actuators. The 10 CFR 50.59 safety evaluation, dated December 3, 1984, was sketchy; however, the supporting engineering studies were extensive. The inspector reviewed the seismic qualifications of the actuators and installed HFA relays, essential power supply to the actuator motors, and component mounting considerations. The inspector also observed actuator and relay installation and post-modification testing (PMT). No problems were identified.

b. RFC DC-12-2883, Revision 0

This RFC designed and installed a new ventilation system inside the EDG rooms to provide supplemental cooling to electrical panels containing solid state instruments. The 10 CFR 50.59 safety evaluation, dated June 17, 1986, was completed under the old format, without detailed checklists, and was considered to be adequate. The inspector reviewed the ventilation duct system functional and structural (including seismic) design bases, code application, and formulation, and identified no deficiencies. The inspector also observed the duct work and seismic restraint installations, and had no adverse comments; however, during the review, the following two deficiencies were identified:

(1) Inadequate design interfaces between corporate design engineers in Columbus, Ohio, and systems engineers at the site exist. This was demostrated by the failure to incorporate PMT design acceptance criteria into the test procedures. For example; (1) the pressure drop (ΔP) across a clean ventilation filter should be $\leq$ 0.6 inches of water ("wg) by design. During PMT conducted in 1988 and 1989, the ΔP's measured were 1.2", 0.28", 1.6", and 1.25" wg across clean filters. These deviations were not transmitted to corporate design engineering for evaluation and calculation update, and (2) the differential temperature between the fan start and trip is to be $\geq$ 10°F. This was never tested. The lack of design interface on PMT is considered to be an example of a violation of 10 CFR 50, Appendix B, Criterion III, (315/91006-01a(DRS); 316/91006-01a(DRS)).

(2) There was no acceptance criteria or documentation on the ventilation system air filter surveillances. During the inspection, the site staff developed a surveillance procedure specifying that a dirty filter should be replaced when the ΔP measured 1.5" wg or above. However, the design specified a maximum ΔP for a dirty filter of 1.0" wg. The lack of design interface on system surveillance is considered to be an additional example of a violation of 10 CFR 50, Appendix B, Criterion III (315/91006-01b(DRS); 316/91006-01b(DRS)).

c. RFC DC-12-2883, Revision 1

This RFC corrected a deficiency in the EDG room ventilation system alarm actuation logic which had caused nuisance alarms during air supply fan startup, and manual operation of the exhaust fan. To remove this "Room Vent Abnormal" nuisance alarm, a 20-second time delay was installed to allow for damper opening after the supply fan had started. To remove the "Room Vent Damper Abnormal" nuisance alarm, the exhaust fan was allowed to run without supply air damper open. The other annunciated conditions including failure of damper to open while supply fan is running and EDG room temperature $\geq$ 110°F remained unchanged.

The 10 CFR 50.59 safety evaluation, dated April 10, 1989, had two areas of concern. First, the RFC stated it was not 50.59 applicable, but the change of the alarm logic will require change in annunciator cause descriptions within the operation procedure. Second, checking the "no" blank in the checklist type safety reviews required no written explanation or justification. The licensee's plan to upgrade its 10 CFR 50.59 screening and evaluation program is discussed further in paragraph 6 of this report. The PMT for this modification was also reviewed and was determined to be adequate.

During the inspection, it was determined that the annunciator manual had not been revised after system modification had been completed. The licensee performed a review and revised the manual; however, some of the functional changes, such as exhaust fan and air supply damper alarm/interlock, were not reflected in the revision. The error could have been avoided if the revisions were reviewed and concurred with by the corporate design engineers. The lack of design interface on operation procedure update is considered to be a further example of a violation of 10 CFR 50, Appendix B, Criterion III (315/91006-01c(DRS); 316/91006-01c(DRS)). The licensee has issued a Condition Report on this matter.

d. RFC 12-3020

This modification was to install and modify 66 Copes Vulcan valves supports based on a revised piping stress analyses. The revised analyses incorporated corrected valve weights supplied by the manufacturer. The inspector reviewed the 10 CFR 50.59 Safety Review

Memorandum, including the checklists dated February 7, 1989, and the design change overview dated March 2, 1989, and had no adverse comments.

e. RFC 02-3023

This modification restores various seismic class 1 piping system support discrepancies through minor modifications to the as-designed or as-approved condition. The discrepancies were identified through various problem reports during inservice inspections. The inspector reviewed the licensee's 10 CFR 50.59 safety reviews including checklists dated January 13, 1989, and design change overview dated January 30, 1989, and had no adverse comments.

3. Minor Modification (MM)

The inspector selected MM12-071 for a detailed technical review. This MM removed the EDG bypass lube oil filter inlet pressure gauge and plugged the connections. The 10 CFR 50.59 applicability screening for this MM dated September 21, 1989, concluded the regulation requirements were not applicable. This conclusion was based on a technical evaluation citing the replacement of oil filters every refueling outage and the checking of oil purity monthly. These activities were verified by the inspector. The technical evaluation failed to discuss the other two bypass lube oil functions, heating of the lube oil to reduce engines stress caused by emergency starting, and priming of the engine driven main lube oil pump suction. The removal of the pressure gauge will reduce or eliminate any means to monitor pump and system performance. If the pump stopped or oil flow was significantly reduced, the EDG could be damaged if it were operating, or in the case of a low flow condition the lube oil could catch fire due to excessive heating. The licensee concurred with the inspector's concerns, and committed to provide monitoring of system performance in the future.

During walkdown of EDG 2CD, the inspector noticed that an unauthorized pressure gauge had been installed at the bypass lube oil pump discharge. Further investigation by the licensee found the same situation on EDGs 1AB and 2AB. The licensee was not able to ascertain when and why these gauges were installed, or by whom. The lack of design control on a modification to a system is considered to be an additional example of a violation of 10 CFR 50, Appendix B, Criterion III (315/91006-01d(DRS); 316/91006-01d(DRS)). The licensee has also issued a Condition Report on this matter.

4. Temporary Modification (TM)

The inspector selected two TMs for detailed technical review.

a. TM 236

This TM relocated Units 1 and 2 plant air compressor (PAC) oil reservoir breather outlet further away from the air intakes. Oil

spray accumulation was found on the breather outlet caused by pressurization of the resservoir with compressed air due to improperly installed impeller seals. The 10 CFR 50.59 applicability screening for this TM dated April 20, 1989, concluded that the regulation requirements were not applicable. However, NRC Generic Letter (GL) 88-14 was not included in the screening process. During a followup GL 88-14 review, the licensee identified that a plant air quality check was done quarterly, not monthly as reported, and that plant daily and shift surveillance procedure requirements to remove the control air after-filter from service at 40" wg Δp was contrary to the reported 12" wg ΔP. The licensee committed to revise the response to the NRC on the air quality check schedule, and revised the procedure on filter ΔP.

At the time of the inspection, the system configuration located the oil reservoir breather approximately five feet below the PAC air intake. Oil vapor generated from heated oil in the reservoir, and air leakage resulting through normal wear of the impeller seals could cause possible contamination of the PAC air supply. The licensee concurred, and committed to initiate a modification to relocate the oil reservoir breather further away from the PAC air intake.

b. TM 261

This TM replaced a solenoid valve in the PAC unloading system. The existing solenoid valve replaced the original component and caused system pressure to oscillate in certain operating conditions because of its inherent 5 psi ΔP actuation characteristic. The new solenoid valve called for zero ΔP during actuation and resolved the PAC operation problem. The 10 CFR 50.59 applicability screening for this TM dated January 24, 1990, concluded that regulation requirements were not applicable without including GL 88-14 as a part of the screening process. A re-evaluation of the 10 CFR 50 including the review of the GL supported the original conclusion.

5. Licensee Design Interface

A prevalent problem with the licensee's design control is the lack of interface between the various organizations involved in the areas such as PMT, surveillance, and operation procedure update. In discussion with the licensee staff on the causes of the deficiencies identified in paragraph 2 of this report, a licensee program weakness surfaced. At the time of the inspection, there was no site engineering feedback to close the design initiation, implementation, verification, and reconciliation loop. It is recognized that some technical requirements, such as PMT coordination and setup, could be in whole or in part a site responsibility because of the expertise in machinery, instrumentation, and controls; however, the PMT requirements and the PMT acceptance criteria should be solely the responsibility of the corporate design staff. Because corporate design is responsible for the design of the

modification, and knows the reasons behind the development of PMT criteria, surveillance and operational procedures. Feedback should be communicated and the procedures updated to maintain the validity of the design calculations and system configuration. Licensee program upgrade will be tracked through the violation followup.

6. Licensee 10 CFR 50.59 Implementation

A number of licensee 10 CFR 50.59 implementation problems were revealed during review of RFC 2883, Revision 1 (paragraph 2.c); MM 071 (paragraph 3); TM 236 (paragraph 4.a); and TM 261 (paragraph 4.b). Because of these problems, the inspector conducted a brief review of the present 10 CFR 50.59 program delineated in the following procedures:

- IMP Plant Manager Instruction (PMI) 1040, "Plant Nuclear Safety Review Committee," Revision 10, dated October 29, 1990. Reviewed areas were restricted to nuclear safety evaluation for 10 CFR 50.59 applicability determination.

- AEP Nuclear Safety and Licensing Procedure (NS&L) QP-7, "Safety Reviews," Revision 5, dated January 23, 1990.

The inspector's review concluded the following:

- The procedures were comprehensive in scope and provided detailed instructions for users. For modification with extended work implementation (labor and material intensive) but simple engineering, such as RFCs 3020 (paragraph 2.d) and 3023 (paragraph 2.e), the program appeared to be adequate.

- Some of the concerns raised during the inspection appeared to be a result of lack of technical discussion or justification on how a "NO" input was derived in the safety review checklist. Unlike a "YES" input, the program required no written discussions for a "NO" input. Although the procedures provided extensive justifications for the "NOs", it was nevertheless inconceivable that these generic and proceduralized justifications could address all specific system design and operational conditions and situations.

The licensee concurred with the inspector's observation, and committed to: (1) revise NS&L QP-7 to require written justifications on all safety evaluations, and (2) re-evaluate site implementation of PMI 1040. Prior to the conclusion of the inspection, PMI-1040 was revised to include in the review coverage the responses to NRC Generic Letters and Bulletins.

7. Housekeeping

During the inspection walkdown, the plant systems were observed to be in good condition, and plant area housekeeping was observed to be above average. These are indications of a well maintained facility.

8. Exit Meeting

The inspector met with the licensee representatives (denoted in paragraph 1) on March 14, 1991. The inspector summarized the scope and findings of the inspection. The licensee acknowledged the statements made by the inspector with respect to the violation and other concerns. 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 and licensee did not identify any such documents/processes as proprietary.