

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-316/88002(DRS)

Docket No. 50-316

License No. DPR-74

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

Facility Name: D. C. Cook Nuclear Plant, Unit 2

Inspection At: D. C. Cook Site, Bridgman, Michigan

Inspection Conducted: December 3, 1987, January 15,  
and February 4-5, 1988

Inspector: *John M. Jacobson*  
J. M. Jacobson

2/22/88  
Date

Approved By: *D. H. Danielson*  
D. H. Danielson, Chief  
Materials and Processes  
Section

2/22/88  
Date

Inspection Summary

Inspection on December 3, 1987, January 15, February 4-5, 1988  
(Report No. 50-316/88002(DRS))

Areas Inspected: Routine, unannounced safety inspection of the procedures, personnel qualifications, and results of the Unit 2 eddy current examination of the Steam Generators (73755) and the Auxiliary Building crane upgrade for steam generator replacement (37702).

Results: No violations or deviations were identified.



## DETAILS

### 1. Persons Contacted

American Electric Power Service Corporation (AEPSC)  
Indiana and Michigan Power Company (I&M)

J. Rutkowski, Assistant Superintendent - Production  
\*J. White, Site Project Manager  
S. Hodge, Engineering Manager  
W. Modry, Supervising Designer Structural  
T. McElroy, Plant Project Engineer  
R. Rickman, Supervisor, ISI/NPRDS  
T. Postlewait, Technical Engineering Supervisor  
J. Droste, Maintenance Supervisor  
\*T. Osmundsen, Construction Supervisor  
E. Morse, NDE Supervisor  
J. Steinhauser, Assistant NDE Supervisor  
J. Winckel, QA Coordinator - Construction  
C. Rapp, Site Manager  
R. Perks, Construction/Engineering Manager

#### MK - Ferguson

A. Walcutt, Site QA Manager  
R. Wilkerson, Assistant Project Manager  
M. Cepkauskas, Project Engineer

\*Attended the exit meeting on February 5, 1988.

### 2. Steam Generator Repair Project

The upcoming replacement of the Unit 2 Steam Generators requires modifications to the existing Auxiliary Building crane. The modification includes replacing the existing 150T/20T trolley with a 150T trolley designed to Single-Failure-Proof (SFP) requirements, and installation of a new SFP crane with 150T and 20T trolleys. Additionally, the existing crane rail girder will be upgraded to accommodate the higher design wheel loads and a second holding brake and an inching mechanism will be added to the bridge drive. The modifications are being performed to meet the requirements of NUREG-0612 and 0554 and to permit the movement of the Steam Generators in and out of the Auxiliary Building.

The NRC inspector reviewed the AEP design drawings S-SGR-12-3123-1, Revision 2, and S-SGR-12-3128-0, Revision 1 for the crane rail girder upgrade and visually inspected the in-process work on several occasions. During the installation of the web stiffener plates, cracking of some attachment welds occurred. The cracking was caused in part by improper weld preheat and the highly restrained nature of the weld joint design.

Cracked welds were removed and rewelded utilizing proper preheat and weld peening techniques. To lessen the chance of cracking additional welds, the joint design and attachment techniques were modified. The NRC inspector reviewed the AEP design sketch S-SGR-SSk 112187 and inspected the installation on several occasions. As a result of the new design and installation techniques, no further weld cracking occurred. Several Condition Reports, issued to resolve girder base metal linear indications and other construction problems of a minor nature were reviewed and found to be adequately resolved.

The NRC inspector reviewed the following welder qualifications and associated radiographs:

<u>Welder No.</u>	<u>Film No.</u>
C-68	R 2310
C-133	R 2059-60
C-136	R 2136
C-148	R 2152
C-158	R 2164
C-163	R 2169
C-169	R 2279
C-177	R 2310

All qualifications and associated radiographs were found to be acceptable and in accordance with the AWS D1.1 Structural Code. In addition, the contractor's Welding Procedure CS-1004 was reviewed and found acceptable.

The AEP "Welder Performance Qualification" Specification DCC ME 154 QCN, Revision 3 was reviewed by the NRC inspector and found to lack sufficient detail with regard to the qualification and record keeping of both in-house maintenance welders and construction contract welders. This issue will remain an unresolved item pending review of a forthcoming administrative procedure (316/88002-01).

The NRC inspector reviewed the following MK-Ferguson procedures to be utilized on the Steam Generator Repair Project:

° Design Control	SQP-3.1, Revision 0
° Receipt Inspection	FQP-7.1, Revision 0
° Qualification and Certification of Inspection Personnel ANSI N45.2.6	FQP-2.1, Revision 0

In addition, the NRC inspector reviewed the following D. C. Cook Project Procedures:

- SGRP Site Technical Document Control                      SGR PP 06-02, Revision 1
- SGR Project Organization                      SGR PP 01-01, Revision 0
- SGRP Work Package System                      SGR PP 05-04, Revision 1

All procedures reviewed were found to comply with applicable codes, standards and licensee commitments.

### 3. Unit 2 Polar Crane

A walkdown survey of the Unit 2 polar crane was performed by the licensee in October 1, 1987. This walkdown disclosed several structural deviations including the following:

- Loose or missing rail plate hold down nuts
- Rail splice weld cracks (two locations)
- Bottom rail flange crack
- Rail plate hold down bolts cut off (two locations)

The structure is designed as Class I and was analyzed by the licensee in the as-found condition. The structure was analyzed using the natural frequencies for the crane derived by the crane manufacturer. The calculation (3195-170-FC) demonstrated that the deviations do not affect the shear capacity of the anchorage and therefore, the seismic qualification remains unchanged. With regard to the uplift load from the wheel truck up-kick-plate, the rail is capable of transferring the load from the cut-off bolts locations, to adjacent elements. The shear capacity of the structure was found to be unaffected by the cracked rail splices and bottom flange. Though the seismic qualification remains unchanged, the licensee has elected to weld repair the cracks and repair the cut-off bolts. All loose or missing hold down nuts will be tightened or replaced as required.

The NRC inspector reviewed the walkdown surveillance report and the calculations supporting the as-found condition. The calculations were found to be acceptable and a review of the repairs will be performed upon completion. This will remain an open item pending review of the repairs (316/88002-02).

### 4. Unit 2 Eddy Current Examination

During September 1987, Combustion Engineering (CE) conducted eddy current examinations of Unit 2 Steam Generators 21, 22, 23, and 24. All unplugged tubes were examined from the hot leg tube end, through the hot leg seventh support plate. All tubes examined received an analysis by Conam in addition to the CE analysis. Indication resolutions were performed by both CE and Conam Level III personnel.

Multifrequency testing equipment was utilized to allow filtering of tube support signals and to permit limited dent assessment in a single pass of the probe through the tube. A Zetec MIZ-18 and a digital data cartridge

recorder was utilized with a differential bobbin coil probe. The recorded data was analyzed with the aid of a Zetec DDA-4 digital data analyzer.

A total of 3229 tubes were examined, resulting in the required plugging of the following:

- ° SG #21                    14 tubes
- ° SG #22                    17 tubes
- ° SG #23                    17 tubes
- ° SG #24                    30 tubes

To date, Unit 2 has a total of 951 tubes or 7.02% taken out of service due to tube degradation.

The NRC inspector reviewed the following CE procedures:

- ° Cook-410-004, Revision 0 - Procedure for Multifrequency Eddy Current Examination of Non-ferromagnetic Steam Generator Tubing Using Zetec MI2-18 Equipment.
- ° Cook-410-005, Revision 0 - Eddy Current Data Analysis Procedure Evaluation of Westinghouse Steam Generator Tubing.
- ° NQAI 2.4, Revision 4 - Certification Program for Nondestructive Examination Personnel.

The procedures were found to be in accordance with the ASME Boiler and Pressure Vessel Code, Section XI, 1983 Edition with Summer 1983 Addenda and the intent of USNRC Regulatory Guide 1.83.

A sample of personnel qualifications were reviewed and found to comply with SNT-TC-1A, 1980 Edition and ANSI N45.2.6 - 1978.

#### 5. Open Items

Open items are matters which have been discussed with the licensee, which will be reviewed further by the inspector, and which involves some action on the part of the NRC or licensee or both. Open items disclosed during this inspection are discussed in Paragraph 3.

#### 6. Unresolved Items

An unresolved item is a matter about which more information is required in order to ascertain whether it is acceptable item, an open item, a deviation, or a violation. Unresolved items disclosed during this inspection are discussed in Paragraph 2.

7. Exit Interview

The Region III inspector met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection. The inspector summarized the purpose and findings of the inspection. The licensee representatives acknowledged this information. The inspector also discussed the likely informational content of the inspection report with regards to documents or processes reviewed during the inspection. The licensee representatives did not identify any such documents/processes as proprietary.