

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-373/85035(DRS); 50-374/85036(DRS)

Docket Nos. 50-373; 50-374

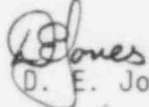
Licenses No. NPF-11; NPF-18

Licensee: Commonwealth Edison Company
Post Office Box 767
Chicago, IL 60690

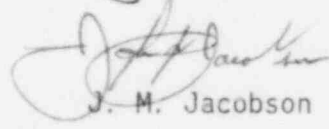
Facility Name: LaSalle County Station, Units 1 and 2

Inspection At: LaSalle Site, Marseilles, IL

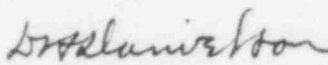
Inspection Conducted: October 23-24, November 5, December 10-12, 1985, and
January 14-16, 29-30, February 12-13, and March 5-6,
13-14, 1986

Inspectors: 
D. E. Jones

3-21-86
Date


J. M. Jacobson

3/21/86
Date

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

3/21/86
Date

Inspection Summary

Inspection on October 23-24, November 5, December 10-12, 1985, and January 14-16, 29-30, February 12-13, and March 5-6, 13-14, 1986 (Reports No. 50-373/85035(DRS); 50-374/85036(DRS))

Areas Inspected: Routine unannounced inspection of licensee action on open items, Inservice Inspection (ISI) activities, implementation of actions set forth in NRC Generic Letters 84-11, and activities related to Induction Heating Stress Improvement (IHSI).

Results: No violations or deviations were identified.

DETAILS

1. Persons Contacted

Commonwealth Edison Company (CECo)

- *B. Bishop, Services Superintendent
- *D. Berkman, Assistant Services Superintendent
- *R. Jeisy, Station Quality Assurance Supervisor
- P. Manning, Technical Staff Supervisor
- *D. Zoloty, ISI Coordinator
- R. Clark, Quality Control Supervisor
- T. Haaker, SMAD/NDE
- M. Horbaczewski, NDS/Maintenance
- J. Foster, General Engineer, Performance Mechanical

NUTECH

- B. Whiteway, Site Project Manager
- B. Ferguson, Field Quality Assurance Supervisor

General Electric (GE)

- M. Heath, NDE Site Supervisor

Hartford Steam Boiler Inspection and Insurance Company

- B. Caldwell, Authorized Nuclear Inservice Inspector (ANII)

Personnel Present At LaSalle Pre-ISI Meeting

- D. Zoloty, ISI Coordinator, CECo
- R. Clark, Quality Control Supervisor, CECo
- R. Sagmoe, ISI, CECo
- R. Kinschger, ISI, CECo
- M. Horbaczewski, NSD/Maintenance, CECo
- T. Haaker, SMAD-NDE, CECo
- D. Hooper, Project Manager, GE
- M. Heath, NDE Site Supervisor, GE
- B. Caldwell, ANI/ANII, Hartford
- D. Jones, Reactor Inspector, USNRC

The inspector also contacted and interviewed other licensee and contractor employees.

*Denotes those present at the final exit interview on March 14, 1986.

2. Licensee Action on Previous Inspection Findings

(Closed) Open Item (373/83-31-01): "Disposition of Welds Not Receiving IHSI." This item is discussed in Paragraph 4 of this report.

(Closed) Open Item (373/83-53-06): "Corrective Actions for DFP Cracked Flywheels." This item was originated in Inspection Report No. 50-373/83-53, and a followup was documented in Inspection Report No. 50-373/84-10. It was later tracked by Open Items No. 373/84-11-01 and 374/84-15-01, which are discussed below:

(Closed) Open Item (373/84-11-01, 374/84-15-01): "Review of Metallurgical Evaluation of Cummins Diesel Engine Flywheels." The NRC inspector reviewed the licensee's metallurgical evaluation of the failed flywheels, the evaluation concluded that the cracking in the flywheels was induced by fatigue. The licensee's data indicates that the source of cyclic loading is the flywheel's response to intrinsic engine vibration. The metallographic examination revealed the flywheels to be pearlitic gray iron, which is characterized by graphite flakes. Fatigue cracking in gray iron is typified by the propagation of the crack along a path coincident with many individual graphite flakes. Each graphite flake acts as a notch, encouraging the propagation of the crack.

The gray iron flywheels were replaced by ductile iron flywheels, which incorporated other machining process improvements. In ductile iron, graphite exists as nodules rather than the flake form found in gray iron. The nodules do not function as notches the way flake graphite does; this, combined with the higher strength of ductile iron, results in greater fatigue resistance.

The licensee inspected the new flywheels after 50 hours of operation and found no indication of cracking. The flywheels will be inspected again after an additional 100 hours of operation. If no cracks are found after this 150 hour period, the licensee will then extend the flywheel inspection interval to match the two year inspection interval for the remainder of the Fire Pump Diesel Engine.

3. Inservice Inspection (ISI) - Unit 1

a. General

This is the first outage of the first ten year plan.

A pre-ISI meeting was held at the site on November 5, 1985 (see attendance list, Paragraph 1). The purpose of the meeting was to discuss the upcoming Unit 1 ISI.

CECo performed the Visual Examination and contracted with GE to perform the Ultrasonic (UT), Magnetic Particle, and Liquid Penetrant Examinations, in accordance with ASME Section XI, 1980 Edition, Winter 1980 Addenda.

CECo identified 13^{1/2} welds that met the NRC Generic Letter 84-11 criteria for reinspection, and a sample of 33 welds was selected. This sample was a minimum to be inspected under Generic Letter 84-11 recommendations; however, since Post-IHSI UT was also performed, a total of 126 welds were inspected. The GE NDE personnel responsible for the examinations and the CECO, Level III, UT personnel responsible for reviewing the indications, have successfully passed the EPRI detection practical examination.

As a result of the Post-IHSI UT examinations, the following welds exhibited "crack-like" indications:

- 1-RR-1005-27A (two indications)
- 1-RR-1001-10 (two indications)

The indications were evaluated by NUTECH as being IGSCC. NRR was apprised of the indications during a CECO conference call. NRR will evaluate the examination data.

b. Program/Procedure Review

The NRC inspector reviewed the following program/procedures:

- CECO, Inservice Inspection Program, LaSalle County Station, Unit 1, Revision 1
- CECO, Non-Aqueous Red Dye Liquid Penetrant Examination for Section XI, Class IWB and IWC Components for Nuclear Stations, NDT-D-2, Revision 5
- CECO, Magnetic Particle Examination for ASME, Section XI, Class IWB and IWC Components for Nuclear Stations, NDT-B-1, Revision 2
- CECO, Ultrasonic Inspection of Flange Ligaments Between Threaded Bolt Holes, NDT-C-11, Revision 11
- CECO, Ultrasonic Examination of Reactor Vessel Welds to NRC Reg. Guide 1.150 for Boiling Water Reactors, NDT-C-30-80, Revision 0
- CECO, Ultrasonic Inspection of Pressure Retaining Bolting Two Inches or Greater in Diameter at Nuclear Stations, NDT-C-14, Revision 8
- CECO, Preservice and Inservice Ultrasonic Inspection of Similar and Dissimilar Metal Pipe Welds at Nuclear Stations, NDT-C-2, Revision 15
- CECO, Beam Spread and Refracted Angle Determination to NRC Reg. Guide 1.150 for Boiling Water Reactors, NDT-C-31-80, Revision 0
- GE, Procedure for Ultrasonic Examination of Pipe Welds using Automated Equipment, UT 1.43, Revision 4
- CECO, Visual Examination-Welds, Pressure Retaining Bolting, and Component Internals, VT-1-1, Revision 2
- CECO, Visual Examination-System Hydrostatic and Leak Tests, VT-2-1, Revision 1

No violations or deviations were identified.

c. NDE Personnel Certifications and Observations of Work Activities

The NRC inspector reviewed NDE personnel certifications in accordance with SNT-TC-1A.

The NRC inspector also observed the work and had discussions with personnel during the following examinations:

- Magnetic Particle Examination of Weld 1-RH-1023-14, in accordance with CECO Procedure NDT-B-1, Revision 2, "Magnetic Particle Examination for ASME, Section XI, Class IWB and IWC Components for Nuclear Stations"
- Ultrasonic Examination of Weld 1-RR-1001-13 in accordance with GE Procedure UT 1.43, Revision 4, "Procedure for Ultrasonic Examination of Pipe Welds Using Automated Equipment"
- Ultrasonic Calibration for Welds 1-RR-1001-1 and 1-RR-1001-1-LU in accordance with CECO Procedure NDT-C-2, Revision 15, "Preservice and Inservice Ultrasonic Inspection of Similar and Dissimilar Metal Pipe Welds at Nuclear Stations"

No violations or deviations were identified.

d. Material and Equipment Certification

The NRC inspector reviewed the certification documents, relative to the following items:

- Ultrasonic Instruments, Transducers, Couplant
- Magnetic Particle Yoke
- Liquid Penetrant Materials (Penetrant, Cleaner, Developer)

No violations or deviations were identified.

e. Data Review

The NRC inspector reviewed report documentation relative to the following:

- Ultrasonic Examination
- Liquid Penetrant Examination
- Magnetic Particle Examination

No violations or deviations were identified.

4. Induction Heating Stress Improvement (IHSI) - Unit 1

a. General

The NRC inspector reviewed the IHSI program being implemented at LaSalle, Unit 1, to prevent the initiation of Intergranular Stress Corrosion Cracking (IGSCC) in sensitized austenitic stainless steel BWR recirculation piping.

IHSI is a process which uses induction coils to heat the outer circumference of the pipe at the weld areas, while cooling the inside surface of the pipe with flowing water to induce a temperature gradient across the pipe wall thickness. During the heating cycle, the inside diameter (ID) is in tension and the outside diameter (OD) is in compression, and the metal in the OD yields due to the higher temperature; while the ID does not change dimensions. When the power to the induction coil is turned off, the water flow in the pipe quickly reduces the temperature of the pipe wall which puts the OD in tension and the ID in compression. IGSCC is less prone to initiate in the ID of austenitic stainless steel piping exposed to reactor coolant water when it has been put into compression by IHSI.

IHSI was performed on 126 welds out of a total of 133 welds identified for the process. Six welds were inaccessible and one weld was later confirmed to be carbon-to-carbon, and therefore, not in need of IHSI.

b. Procedure Review

The inspector reviewed NUTECH Procedure XCE-18-100, Revision 2. "Procedure for Induction Heating Stress Improvement at LaSalle Nuclear Power Station, Unit 1."

No violations or deviations were identified.

c. Equipment Certification

The NRC inspector reviewed the following certification documents:

- Thermocouple and Temperature Recorder Calibration Records
- Thermocouple and Digital Thermometer Calibration Records

No violations or deviations were identified.

d. Personnel Certifications and Observations of Work Activities

The NRC inspector reviewed the following personnel certifications:

- Capacitive Discharge Welder Qualification Records
- IHSI Power Supply Operator Qualification Records

The NRC inspector also observed the IHSI of the following welds:

- 1-RR-1001-10B (Pipe-to-Pipe)
- 1-RR-1001-26 (Pipe-to-Safe-End)

No violations or deviations were identified.

e. Data Review

The NRC inspector reviewed the following documentation:

- IHSI Weld Packages (Mechanical Revision Directive, Traveler Package, IHIS Heating Record and Thermocouple Setting Instruction Sheet)

No violations or deviations were identified.

5. Exit Interview

The NRC inspector met with the licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on March 14, 1986. The inspector summarized the purpose and findings of the inspection. The licensee representatives acknowledge this information. The inspector also discussed the likely informational content of the inspection report with regard to documents or processes reviewed during the inspection. The licensee representatives did not identify any such documents/processes as proprietary.