U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-306/88003(DRS)

Docket No. 50-306 License No. DPR-60

Licensee: Northern States Power Company
414 Nicollet Mall
Minneapolis, MN 55401

Facility Name: Prairie Island Nuclear Generating Plant, Unit 2

Inspection At: Prairie Island Site, Red Wing, Minnesota

Inspection Conducted: January 11-14, 1988

Inspector: K. D. Ward — Date: 1/25/88

Approved By: D. H. Danielson, Chief
Materials and Processes Section — Date: 1/25/88

Inspection Summary

Inspection on January 11-14, 1988 (Report No. 50-306/88003(DRS))
Areas Inspected: Routine, unannounced inspection of inservice inspection (ISI) activities including review of programs (73051), procedures (73052), observation of work activities (73753), and data review (73055), and an accumulator leak (73052, 73753, 73765).
Results: No violations or deviations were identified.

DETAILS

1. Persons Contacted

Northern States Power Company (NSP)

*E. Watzl, Plant Manager
*M. Klee, Superintendent Quality Engineering
*L. Dahlman, Senior Material and Special Processes Specialist
R. Kellerhall, Material and Special Processes Specialist
S. Redner, Material and Special Processes Specialist

Nuclear Regulatory Commission (NRC)

*J. Hard, Senior Resident Inspector

Lambert, MacGill, Thomas, Inc. (LMT)

D. MacGill, Supervisor, Level III

Westinghouse Electric Corporation (W)

W. Stock, Analyst

Hartford Steam Boiler Inspection and Insurance Co. (HSB)

K. Kilmer, ANII

CONAM Inspection (CONAM)

B. Marlow, Supervisor

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

*Denotes individual present at the exit interview January 14, 1988.

2. Inservice Inspection (ISI) Unit 2

a. General

This is the twelfth outage of the first period of the second ten-year plan.

(1) Lambert, MacGill, Thomas, Inc. (LMT), CONAM Inspection (CONAM), and Westinghouse Electric Corporation (W) performed the ISI in accordance with ASME Section XI, 1980 Edition, Winter 1981 Addenda. The Level II and III LMT personnel performing UT were qualified for detection and discrimination of intergranular stress corrosion cracking (IGSCC) by Electric Power Research Institute (EPRI).

(2) All manual UT was performed by LMT using the pulse-echo UT flaw detection instruments and various angles and MHZ transducers. Also on many welds the master/slave ultrasonic system was used.

(3) The eddy current examinations (ET) were performed by CONAM, and the results were evaluated by Westinghouse and CONAM. The ET covered 100% of all accessible tubing within steam generators (SG) No. 21 and 22.

b. Program and Procedures

The NRC inspector reviewed the ISI program and procedures and found them to be acceptable. NSP made no specific request for relief from the ASME Code in performing this ISI outage.

c. Review of Data, Audits and Certifications of Material, Equipment and Personnel

The NRC inspector reviewed documents relating to the following:

- Ultrasonic instruments, calibration block, transducers and couplant certifications.
- Liquid penetrant, cleaner and developer ma erials.
- Magnetic particle, materials and equipment.
- NDE personnel certifications in accordance with SNT-TC-1A.
- Data reports.
- Audits/Surveillances.
- Eddy current equipment.

d. Observation of Work Activities

The NRC inspector observed work and had discussions with personnel during the ISI activities. These observations included the performance of the following:

- Eddy current examination of several steam generator tubes on steam generator No. 21 and No. 22.
- Ultrasonic examination of feedwater heater partition covers No. 25A and B, steam generator primary manway bolts, accumulator discharge "A" weld W-5, and the master/slave ultrasonic system being used.
- Liquid penetrant examination of RHR pump discharge "B" weld W-23.

- Wet magnetic particle examination of steam generator primary manway bolts.

- Independent eddy current examination data review by CONAM and Westinghouse.

No violations or deviations were identified.

3. No. 22 Accumulator Level Indication Nozzle Failure Investigation

During a walkdown of this outage by NSP, a very small boric acid leak was noted on the outside of the No. 22 accumulator tank level indicator nozzle. A preliminary investigation by NSP indicated a pinhole at six o'clock approximately 1/16" from the shell to the nozzle weld.

The decision was made by NSP to cut a boat sample to determine the cause of the leak. The boat sample was sent to Engel Metallurgical for investigation. Upon investigation, it was found that although there was only a pinhole leak on the surface, there was a large subsurface crack. Upon further investigation, the following conclusions were made by NSP:

a. The nozzle material exhibited a fine grain structure.

b. The nozzle material was significantly sensitized. This apparently resulted from the 1100°F PWHT the vessel received at the time of fabrication.

c. The cracking was intergranular in nature with extensive branching.

d. The cracks were limited to the nozzle material and did not propagate into the weld metal.

e. There were large numbers of stringers in the nozzle material. The composition of the stringers had not been determined prior to the NRC inspector's exit interview.

Based on the above information, it was determined by NSP that the failure was probably caused by a corrosion cracking mechanism. Exact mechanism (i.e., stress corrosion, crevice corrosion, etc.) had not been determined.

When the vessel was open for entry, the outside diameter of the nozzle was liquid penetrant examined (PT). A linear indication was found at six o'clock (bottom of nozzle) running from end to end approximately 5".

The three other nozzles in the vessel were PT'd and no unacceptable indications were found.

On January 12, 1988, the Senior NRC Resident Inspector wrote a daily report and will follow the failure investigation of this item until completed.

The NRC inspector visually examined, from both inside and outside of the vessel, the accumulator nozzle that had been leaking. Drawings and related documentation were reviewed.

No violations or deviations were identified.

4. Exit Meeting

The inspector met with site representatives (denoted in Persons Contacted paragraph) at the conclusion of the inspection. The inspector summarized the scope and findings of the inspection noted in this report. 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/processes as proprietary.