

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-282/92020(DRS);
50-306/92020(DRS)

Licenses No: DPR-42;
Licenses No: DPR-60

Docket Nos. 50-282; 50-306

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

Facility Name: Prairie Island Nuclear Generating Station
Units 1 and 2

Inspection At: Prairie Island Site, Red Wing, MN

Inspection Conducted: September 28 through December 23, 1992

Inspector: K. D. Ward
K. D. Ward

12/30/92
Date

Approved By: J. M. Jacobson
J. M. Jacobson, Chief
Materials and Processes Section

12/31/92
Date

Inspection Summary

Inspection on September 28-October 1, November 16-18, 23-25, December 16-18, and December 22-23, 1992 (Reports No. 50-282/92020(DRS); 50-306/92020(DRS)).

Areas Inspected: Routine, unannounced safety inspection of inservice inspection (ISI) activities, including review of programs (73051), data (73755), procedures (73052), observations of work activities (73753), review of the erosion/corrosion (E/C) program (49001), facility modifications (37701), and licensee action on previous inspection findings (92700, 92701).

Results: No violations or deviations were identified. Based on the results of the inspection, the NRC inspector noted the following:

- o The implementation of the ISI, E/C and modifications complied with the requirements of the applicable Codes and the licensee's program.
- o Licensee staff and contract personnel involved in the ISI, E/C and modifications were knowledgeable and competent.
- o In general, the inspection results indicate continuing good performance in the areas of ISI, E/C and modifications.
- o The licensee's actions in resolving the previous inspection findings were found to be acceptable.

DETAILS

1. Persons Contacted

Northern States Power Company (NSP)

- *M. Sellman, Plant Manager
- *K. Albrecht, General Superintendent, Engineering
- *G. Miller, Superintendent, Technical support
- *R. Fraser, Superintendent, Mechanical
- *J. McDonald, Superintendent, Site QA
- *J. Bridgman, Senior Materials and Special Processes Engineer
- *T. Jones, Materials and Special Processes
- *M. Vik, Materials and Special Processes
- *L. Ganser, QA Specialist

U. S. Nuclear Regulatory Commission (NRC)

- *M. Dapas, Senior Resident Inspector
- D. Kosloff, Resident Inspector

Lambert, MacGill, Thomas, Inc. (LMT)

- D. MacGill, Level III (Vice President)

Conam Nuclear, Inc. (Conam)

- R. Marlow, Level III

Zetec, Inc. (Zetec)

- R. Vollmer, Level III

Hartford Steam Boiler Inspection and Insurance Company (HSB)

- L. Dillon, ANII

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

*Denotes those present at the exit interview on December 23, 1992.

2. Inservice Inspection - Units 1 and 2

a. Program Review (73051)

Personnel from LMT, Conam Nuclear, Inc., and Zetec, Inc., performed the ISI in accordance with ASME Section XI, 1980 Edition, Winter 1991 Addenda. The licensee did not request relief from the ASME Code for this outage. Audit No. AG 92-38 and surveillances of the ISI program activities performed by Northern States Power (NSP) were

reviewed and found to be acceptable and performed by qualified personnel. Organizational staffing for the ISI program was found to be acceptable and the services of an Authorized Nuclear Inservice Inspector (ANII) were procured from the Hartford Steam Boiler Inspection and Insurance Company.

The qualifications and certifications of all inspection personnel performing ISI were reviewed to ensure conformance with SNT-TC-1A.

b. Procedure Review (73052)

All applicable ISI procedures were approved by the ANII. The ISI procedures were found to be acceptable and in accordance with ASME Section V, 1980 Edition, Winter 1981 Addenda.

c. Data Review (73755)

(1) General

The examination data was found to be in accordance with the applicable ISI procedures and ASME Code requirements. The NRC inspector reviewed documents related to nondestructive examinations, equipment, data, and evaluations.

(2) Eddy Current Examination (ET) Unit 1

The primary to secondary leak rate in steam generator No. 12 was 0.1 gpm prior to the Unit 1 shutdown September 24, 1992. Three tubes were identified with through wall leakage. The major source of this leakage was tube No. R13C43 that had a 11" long axial indication in the tube above the roll transition region. Two additional tubes, No. R15C40 and No. R2C49 were found to be leaking after steam generator No. 12 had been pressurized to 700 psig for two days. Both of these tubes had short multiple axial indications in the roll transition.

Prior to startup, 100% of all accessible tubes in steam generator No. 12 were examined from the first support plate through the tube end. There were 27 unacceptable tubes with all the indications located in the hot leg tube sheet crevice area. All 27 tubes were plugged.

The following was the steam generator No. 12 plugging and sleeving summary prior to start up.

New Indications Plugged This Outage:	27
New Indications Sleeved This Outage:	0
Total Tubes Plugged:	99
Total Tubes Sleeved:	162

Approximately one month later, Units 1 and 2 shutdown and during this outage 100% of all accessible tubes in steam generator No. 12 were examined full length again. Also in steam generator No. 11, 100% of all accessible tubes were examined. The examinations were conducted utilizing the Zetec MIZ-18 multifrequency digital examination equipment with associated acquisition software and remote positioning devices.

Motorized rotating pancake coil (MRPC) examinations were performed in addition to the bobbin coil examinations. Approximately 20% of the tubes in steam generator No. 11 were examined using the MRPC in the tube sheet crevice region. The MRPC examinations were performed on 100% of all accessible tubes in steam generator No. 12.

Conam was contracted to acquire and evaluate the eddy current data. Zetec was contracted to perform a completely independent evaluation of all data acquired by Conam. Zetec utilized computer data screening of all bobbin coil data.

The following tubes were plugged and sleeved as a result of this examination:

Steam Generator No. 11

New Indications Plugged This Outage:	1
New Indications Sleeved This Outage:	0
Total Tubes Plugged:	74
Total Tubes Sleeved:	0

Steam Generator No. 12

New Indications Plugged This Outage:	21
New Indications Sleeved This Outage:	158
Total Tubes Plugged:	120
Total Tubes Sleeved:	319

All of the new steam generator tube plugs were Inconel 690 alloy. Also five Inconel 600 alloy plugs were removed in response to NRC Bulletin 89-01, replacing them with Inconel 690 alloy.

d. Observations of Work Activities (73753)

The NRC inspector observed the following work activities and had discussions with personnel during the ISI activities.

- (1) Conam personnel performing eddy current examinations on the tubes in the two steam generators and Conam and Zetec personnel evaluating eddy current examination data on Unit 1.
- (2) LMT personnel performing ultrasonic examinations using the master/slave video system on pipe weld No. FW-94, and of the steam generators feed nozzle interradious welds No. N1IR-11 and No. N1IR-12. These three welds were on Unit 1. Also observed ultrasonic examinations using the master/slave on the steam generators feed nozzle interradious welds No. N1IR-12 and No. N1IR-22. These welds were on Unit 2.

No violations or deviations were identified.

3. Erosion/Corrosion (E/C) Activities, Units 1 and 2 (49001)

Northern States Power Company (NSP) began their program in 1979. In 1985, a formalized procedure and administrative controls were developed to ensure continued long-term implementation of an E/C monitoring program for piping and components (Reference NRC Inspection Report No. 50-350/92002 (DRS)).

For this refueling outage, NSP selected an inspection sample of approximately 216 components for Unit 1 and approximately 39 components for Unit 2, utilizing the NSP computer program. Of the components examined, one small length of small bore heater drain piping was unacceptable and replaced this outage. The NRC inspector reviewed the E/C program, procedures, NDE certifications, data from previous inspections, and observed LMT personnel performing ultrasonic thickness examinations of several piping components on the high pressure bleed steam system.

To date, several components and pipe sections have been repaired/replaced as a result of the E/C program. The NRC inspector observed the Welding Services, Inc. (WSI) personnel performing cutting, fitting, and welding operations, and visually examined completed repairs on the high pressure bleed system. The NRC inspector also reviewed work requests, drawings, weld data sheets and other related documentation.

No violations or deviations were identified.

4. Modifications (37701) Units 1 and 2

The NRC inspector reviewed plant modifications in progress during the current outage. The designs of the following modifications were in accordance with USAS B31.1-1967, and the required inspections were in accordance with ASME Section XI.

a. Cooling Water Piping, Loops "A" and "B" Modifications No. 92Y170.

A number of indications of wall thinning were identified in the cooling water system. There was a discussion to replace the main header cooling water piping from the outlet of the cooling water strainers (16") through and including motor operated valves No. MV32144 and No. MV3215, that experienced microbiological induced corrosion and resultant pipe wall loss. The new header piping was the same piping material, a 106 grade B, having a 1/2" wall thickness instead of 3/8" wall thickness that existed in the old pipe. Those portions of the cooling water headers embedded in concrete and a portion of the buried piping were replaced and had weld overlay in localized degraded areas. The repaired areas and the new pipe had a protective coating applied as an economic means to prolong the pipe life. Additional valves were added to permit localized system isolation to enhance maintenance.

The NRC inspector observed the Welding Services, Inc. (WSI) and NSP personnel cutting, fitting, and welding operations, and visually examined several completed welds. The NRC inspector also reviewed the welding manual, drawings, weld data sheets, and other related documentation.

No violations or deviations were identified.

b. Reactor Cooling System (RCS) Drain Down Modifications No. 92L362.

During the February 1992, Unit 2 refueling outage, NSP violated 10 CFR 50, Appendix B. Procedure D2, "RCS Reduced Inventory Operation," Revision 21, for draining the RCS did not provide adequate instruction for completing the draining process. The residual heat removal (RHR) cooling flow was interrupted for a period of time due to overdraining of the RCS. In response to this event, NSP identified the following plant modifications that would enhance RCS reduced inventory operations and the drain down process.

(1) Hot Leg Drain Line

This modification modified the RCS piping to provide an RCS hot leg drain path. This piping was routed to limit the RCS level during drain down to just below the top inside diameter of the RCS hot leg piping. A vent pipe and valve was installed to prevent any siphoning effects. This configuration was designed to provide protection against loss of RHR flow due to over draining of the RCS, loss of RHR flow due to failure of the RHR heat exchanger outlet flow control valve and provide for mitigation of loss of RHR accidents.

(2) Purification Line

This modification modified the auxiliary pressurizer spray (AUX PRZ SPRY) line and the reactor coolant drain tank (RCDT) collection line to provide a shut down purification path from the RCS. Double isolation valves were installed in the purification line to provide positive isolation during normal operations. A sectional isolation valve was installed in the spray line to isolate the Loop B spray scoop and the pressurizer from the new purification path. The purification path is from the Loop A PRZ SPRY scoop through the spray line, auxiliary spray line, new purification cross tie line and then via the RCDT collection line to the RCDT. From this point on the shut down purification process was unchanged.

(3) Loop A Communications Line

This modification modified the RTD piping to provide a shut down communication path between the Loop A hot and cold leg RTD piping. The new piping connecting the hot and cold leg RTD piping vent included a new isolation valve. During normal operations the existing vent valve on the cold leg vent and the new isolation valve are to be closed to provide positive isolation between the hot and cold leg RTD manifolds. Between these two isolation valves a common vent was provided. This vent was constructed with a swaglok fitting consistent with existing RCS vents. The Loop B configuration already provides a communication path via the pressurizer.

(4) Reactor Coolant Gas Vent (RCGV) System Orifice Bypass

This modification modified the RCGV piping adjacent to the reactor vessel head to provide a bypass

around the RCGV flow restriction orifice. This modification was required to assure more timely pressure equalization of the reactor head volume with the RCS loop volume during the draining process. The RCGV piping was removed from just below the isolation valve on the reactor head through the first flange connection on the spool piece. The piping and a valve assembly were fabricated to provide a bypass around the orifice including a 3/4" isolation valve which shall be shut during normal operations.

The NRC inspector observed the WSI and NSP personnel cutting, fitting, and welding operations, and visually examined several completed welds. The NRC inspector also reviewed procedures, drawings, weld data sheets, and other related documentation.

No violations or deviations were identified.

c. Feedwater Pipe Modification No. 92Y185

This modification replaced the transition section of the steam generator to feedwater piping which was susceptible to damage from thermal fatigue. The replacement transition section has a greater cross section thus reducing the stresses. The modification was accomplished by cutting back on the steam generator inlet nozzles to a location where the wall thickness was 1-1/31". A forging insert was designed to match the diameter and the wall thickness and was welded in place at this location. The purpose of the modification was to reduce all piping stresses acting on this region of the system, especially the high stresses resulting from the hot standby condition.

The NRC inspector observed a forging insert in place in the steam generator inlet nozzle prior to welding and visually examined the entire area. The NRC inspector also reviewed procedures, drawings, weld data sheets, and other related documentation.

No violation or deviations were identified.

5. Licensee Action on a Previous Inspection Finding

(Closed) Followup Item (50-282/92015-03; 50-306/92-15-03 (DRP) (72701).
(Closed LER No. 011 (72700).

The licensee identified longitudinal weld examinations not performed in the low pressure safety injection (SI), residual

heat removal (RHR), and the main steam (MS) systems.

All the ISI summary reports were reviewed by the licensee for examinations performed from the SI, RHR, and MS drawings. It was found that the carbon steel (C/S) long seam piping and components were in the 30" and 31" diameter MS system. Stainless steel (S/S) long seam piping and components were found in the SI and RHR low pressure systems. A total of 8 examinations in Unit 1 and 7 examinations in Unit 2 were performed on the C/S long seam piping and components and 22 examinations in Unit 1 and 28 examinations in Unit 2 were performed on the S/S long seam piping and components. All the C/S and S/S long seam piping and components examined were found to be acceptable.

The NRC inspector reviewed the "Justification for Continued Operation" (JCO), drawings, NDE reports, other related documentation and considers this followup/LER item closed.

6. Exit Interview

The NRC inspector met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection and summarized the scope and findings of the inspection noted in this report. The NRC 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.