



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
WASHINGTON, D.C. 20555-0001

January 15, 2010

Mr. Mark A. Schimmel  
Site Vice President  
Prairie Island Nuclear Generating Plant  
Northern States Power Company - Minnesota  
1717 Wakonade Drive East  
Welch, MN 55089

**SUBJECT: PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNIT 2 - REVIEW OF THE  
2008 STEAM GENERATOR TUBE INSPECTION REPORT FOR REFUELING  
OUTAGE 25 (TAC NO. ME1172)**

Dear Mr. Schimmel:

By letter dated April 27, 2009 (Agencywide Documents Access and Management System Accession No. ML091180466), Northern States Power Company, Minnesota (NSPM) submitted information summarizing the results of the 2008 steam generator tube inspections at Prairie Island Nuclear Generating Plant (PINGP), Unit 2. These inspections were performed during the 25<sup>th</sup> refueling outage.

As discussed in the enclosed review, the U.S. Nuclear Regulatory Commission staff concluded that NSPM provided the information required by the PINGP technical specifications and did not identify any technical issues that warranted follow-up action at this time.

If you have any questions regarding this matter, please contact me at (301) 415-4037.

Sincerely,

A handwritten signature in black ink, reading "Thomas J. Wengert", is positioned above the typed name.

Thomas J. Wengert, Senior Project Manager  
Plant Licensing Branch III-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-306

Enclosure:  
As stated

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UNITED STATES NUCLEAR REGULATORY COMMISSION  
REVIEW OF 2008 STEAM GENERATOR TUBE INSPECTION REPORT  
PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNIT 2  
DOCKET NO. 50-306

By letter dated April 27, 2009 (Agencywide Documents Access System (ADAMS) Accession No. ML091180466), Northern States Power Company, Minnesota (the licensee), submitted information summarizing the results of the 2008, steam generator (SG) tube inspections performed at Prairie Island Nuclear Generating Plant Unit 2 (PINGP 2) during refueling outage 25. The U.S Nuclear Regulatory Commission (NRC) staff summarized additional information the licensee submitted in an email dated September 1, 2009 (ADAMS Accession Package No. ML100120626), concerning the SG tube inspections. In addition, the NRC staff summarized additional information concerning the 2008, SG tube inspections at PINGP 2 in a letter dated November 6, 2008 (ADAMS Accession No. ML083010562).

PINGP 2 has two Westinghouse model 51 SGs. Each SG contains 3388 mill-annealed Alloy 600 tubes. Each tube has a nominal outside diameter of 0.875 inches and a nominal wall thickness of 0.050 inches. The tubes were roll-expanded into the tubesheet at both ends for approximately 2.75 inches, (i.e., they are expanded for only a fraction of the tubesheet thickness and are considered partial depth hard-rolled tubes). The tubes are supported by a number of carbon steel tube support plates. The original anti-vibration bars were removed and replaced. The row one and two tubes were subjected to an in-situ thermal stress relief in May 2000. Many tubes have been roll-expanded into the tubesheet above the original factory roll expansion to permit defects below these re-rolled locations to remain in service.

In addition to the depth-based tube repair criteria, the licensee is also authorized to apply the voltage-based tube repair criteria for predominantly axially-oriented outside diameter stress corrosion cracking (ODSCC) at the tube support plate elevations. Although authorized to implement the voltage-based repair criteria, the licensee has not found it necessary to implement these criteria since few, if any, indications subject to this repair criteria have been identified at Unit 2. In addition, the licensee is authorized to leave flaws within the tubesheet region in service provided they satisfy the  $F^*/EF^*$  repair criterion. The major cause of degradation within the tubesheet region is primary water stress-corrosion cracking at the roll transition zones. Secondary side intergranular attack and ODSCC have also been observed at this location.

The licensee provided the scope, extent, methods, and results of their SG tube inspections in the documents referenced above. In addition, the licensee described corrective actions, such as tube plugging, taken in response to the inspection findings. The tubes of both SGs (21 and 22) were inspected this outage.

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Enclosure

After reviewing the information provided by the licensee, the NRC staff has the following comments/observations:

- The licensee reported that all crack-like indications detected were confined to within the portion of the tube located in the tubesheet crevice. In addition, no crack-like indication was left in service except for those permitted to be in left in service by the F\*/EF\* alternate repair criteria.
- It was reported that the upper internals of SG 22 were inspected and that no degradation was observed.
- The licensee stated that two tubes in SG 21 (row 8, column 59 and row 9, column 59) were left in service with wear attributed to loose parts that are no longer present. It was further reported that no additional wear due to loose parts was detected or left in service.

Based on a review of the information provided, the NRC staff concludes that the licensee provided the information required by the technical specifications. In addition, the staff concludes that there are no technical issues that warrant follow-up action at this time, since the inspections appear to be consistent with the objective of detecting potential tube degradation and that inspection results appear to be consistent with industry operating experience at similarly designed and operated units.

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*/RA/*

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Plant Licensing Branch III-1  
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ADAMS ACCESSION NO.: ML100120702

\*via memo dated 12/30/09

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