

July 10, 2006

Mr. Thomas J. Palmisano
Site Vice President
Prairie Island Nuclear Generating Plant
Nuclear Management Company, LLC
1717 Wakonade Drive East
Welch, MN 55089

SUBJECT: PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNIT 1 - SUMMARY OF
CONFERENCE CALL REGARDING THE SPRING 2006 STEAM GENERATOR
TUBE INSPECTIONS RE: (TAC NO. MD1784)

Dear Mr. Palmisano:

On May 18, 2006, the Nuclear Regulatory Commission (NRC) staff conducted a phone call with representatives from Prairie Island, Unit 1 (the licensee) to discuss their 2006 steam generator (SG) tube inspections during their 24th refueling outage. The summary of the conference call is enclosed (See Enclosure 1). In support of the phone call, you provided several slides summarizing the SG tube inspection activities during the 2006 outage (see Enclosure 2).

The NRC staff has indicated it would be interested in the results of the root cause analysis associated with the wear indications detected in the SG. Other than this issue, the NRC staff did not identify any other issues that warranted follow-up action at this time.

Sincerely,

/RA/

Mahesh L. Chawla, Project Manager
Plant Licensing Branch III-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-282

Enclosures:

1. Conference Call Summary
2. SG Slides

cc w/encls: See next page

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PRAIRIE ISLAND, UNIT 1
2006 STEAM GENERATOR TUBE INSPECTION ACTIVITIES
CONFERENCE CALL SUMMARY

On May 18, 2006, the Nuclear Regulatory Commission (NRC) staff conducted a phone call with representatives from Prairie Island, Unit 1 (the licensee) to discuss their 2006 steam generator (SG) tube inspections during their 24th refueling outage.

Prairie Island Unit 1, has two Framatome recirculating SGs. Each SG has 4,868 thermally-treated Alloy 690 tubes which have an outside diameter of 0.750-inch and a nominal wall thickness of 0.043-inch. The tubes were hydraulically expanded at each end for the full depth of the tubesheet. The tubes are supported by support plates and antivibration bars (AVBs). All tube support plates are constructed from Type 410 stainless steel. The tube support plates have a minimum thickness of 1.18-inch (and a nominal thickness of 1.25-inch) and have quatrefoil-shaped holes through which the tubes pass. The AVBs are constructed from Type 405 stainless steel and are rectangular in cross section (0.5-inch by 0.3-inch).

The 2006 SG tube inspection was the first inservice inspection of these SGs.

In support of the phone call, the licensee provided several slides summarizing the SG tube inspection activities during the 2006 outage. Enclosure 2, (ADAMS Accession No. ML061670164). Additional clarifying information and information not included in the slides is summarized below:

Various plant indicators were used in assessing whether there was any primary-to-secondary leakage during the previous operating cycle. The tritium concentrations (used in estimating the primary-to-secondary leak rate) were at the detection limit. In addition, the tritium concentrations in Unit 1 may be from Unit 2 since water from one unit may be transferred to the other unit (i.e., cross-talk between the units). The lack of any detectable Argon at the condenser exhaust in combination with the above, most likely indicates that there was no primary-to-secondary leakage during the previous operating cycle.

For some of the indications detected during the preservice inspection, there were some changes in the eddy current signal. These changes were attributed to the thermal cycle the tubes experienced during the first cycle of operation. Similar changes have been observed at other plants.

A number of wear indications were detected at the tube support plates and at the anti-vibration bars. The number of indications was more than expected. As a result, the licensee's SG vendor commenced a root cause analysis. This root cause analysis includes having eddy current data analysts in Lynchburg, Virginia review eddy current data from French plants and having eddy current data analysts in France review the Prairie Island 1 data. This analysis is being performed to ascertain whether the threshold for reporting indications differs. A Belgian plant, Doel 4, has SGs that are similar to Prairie Islands and have only identified one wear indication at a tube support plate. This wear indication was detected after approximately 10 years of operation. There are some design differences between the Prairie Island 1 SGs and other similar SGs designed and fabricated by Framatome (e.g., square tube pitch).

The voltage, depth, and length for the wear indications, are the maximum dimensions from all of the tubes inspected (i.e., they do not necessarily belong to one wear indication).

In SG-11, 56 wear indications were detected at the tube support plates in 40 tubes. In tubes where there were multiple wear indications, the indications were at different tube support plate elevations (rather than having multiple wear indications at the same tube support plate elevation). All of the wear indications were in the hot-leg and most were at the fourth hot-leg tube support plate.

In SG-11, 9 anti-vibration bar wear indications were detected in 5 tubes.

In SG-12, 7 wear indications were detected at the tube support plates in 6 tubes. Wear indications were detected in both the hot- and cold-leg side of the SG.

In SG-12, 32 anti-vibration bar wear indications were detected in 16 tubes.

The two largest wear indications were preventively plugged (i.e., they did not exceed the plugging limit). They were plugged in the event the licensee wanted to extend the time interval between inspections (i.e., to inspect at intervals greater than one fuel cycle).

The largest wear indication left in service at a tube support plate was 13-percent in SG-11 and 12-percent in SG-12. The largest wear indication left in service at an anti-vibration bar was 7-percent in SG-11 and 8-percent in SG-12.

The loose part trapping screens were intact and clear of foreign material.

During sludge lancing in SG-11, approximately a dozen small particles were removed including 3 or 4 metallic chips that appeared to be from a machining process. No similar small particles were identified in SG-12.

The foreign object search and retrieval revealed some general areas of sludge which were approximately 1/16-inch thick. The sludge appeared loose in nature.

The possible loose part indications in SG-11 were concluded to be false positives based on a more detailed evaluation of the bobbin data and the rotating probe data.

Attempts to visually inspect the possible loose part in SG-12 were unsuccessful. The part is estimated to be 30 mils in diameter and 1/8-inch long. These dimensions are based on the part being wedged between the tube and the tube support land (and the tolerances of the quatrefoil opening and the minimum tube diameter), and the rotating probe data indicating the part extending slightly beyond the width of the land (the land has a circumferential extent of approximately 1/8-inch). This signal was not present in the preservice inspection. There was no tube wear associated with the loose part. The tube was plugged.

At the end of the call, the NRC staff indicated it would be interested in the results of the root cause analysis associated with the wear indications detected in the SG. Other than this issue, the NRC staff did not identify any other issues that warranted follow-up action at this time.

Prairie Island Nuclear Generating Plant,
Units 1 and 2

cc:

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