

June 4, 2003

Mr. Douglas E. Cooper  
Site Vice President  
Palisades Nuclear Plant  
Nuclear Management Company, LLC  
27780 Blue Star Memorial Highway  
Covert, MI 49043-9530

SUBJECT: PALISADES PLANT - STEAM GENERATOR TUBE INSERVICE INSPECTION  
TELEPHONE CONFERENCE (TAC NO. MB8241)

Dear Mr. Cooper:

By letter dated April 4, 2003, the NRC staff informed the Nuclear Management Company, LLC (NMC), that a telephone conference would be held with NMC to discuss the ongoing results of the steam generator (SG) tube inspections to be conducted during the spring 2003 refueling outage at the Palisades Plant. The NRC staff stated that the telephone conference would be scheduled after the majority of the tubes had been inspected, but before the SG inspection activities had been completed. The NRC staff indicated its plans to document the telephone conference, as well as any material that NMC may provide to the NRC staff in support of the telephone call via a brief summary.

The enclosure represents a summary of the telephone conferences held on April 4 and April 10, 2003, in which ongoing results of the SG tube inspections conducted during the refueling outage were discussed. The material received from NMC prior to this telephone conference is attached to the enclosed summary of the conference calls.

Sincerely,

**/RA/**

Johnny H. Eads, Project Manager, Section 1  
Project Directorate III  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket No. 50-255

Enclosure: Summary of Conference Call

cc w/encl: See next page

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\* Input provided by Memo

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Palisades Plant

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March 2003

SUMMARY OF CONFERENCE CALLS  
BETWEEN THE NUCLEAR REGULATORY COMMISSION STAFF AND  
THE NUCLEAR MANAGEMENT COMPANY, LLC  
REGARDING 2003 STEAM GENERATOR INSPECTION RESULTS  
PALISADES PLANT  
DOCKET NO. 50-255

On April 4 and 10, 2003, the Nuclear Regulatory Commission (NRC) staff participated in conference calls with Nuclear Management Company, LLC (NMC, the licensee), representatives regarding the steam generator (SG) tube inspection activities at Palisades.

The issues discussed included those listed in the enclosure to the NRC staff's April 4, 2003, letter to NMC documenting the arrangement of the conference calls. The issues discussed are described in the written material provided by the licensee in support of these calls (Attachment). At the time of the first call, inspections with a bobbin coil probe were complete. Inspections with a rotating pancake coil (RPC) probe were in progress in SG A and were complete in SG B. The licensee anticipated completion of the remaining RPC probe inspections later in the day on April 4, 2003. A copy of the written material provided by NMC is attached. The licensee provided the following clarifications of its written material.

- Anytime the licensee performs a historical review of bobbin coil data for the purposes of determining whether a bobbin signal is changing over time, the comparison is performed against the inspection data which was collected prior to initial operation of these steam generators.
- Visual inspections were performed on the tube plugs.
- The bobbin inspection of the tubes in SG A was expanded from a scope of 25 percent to 45 percent of the tubes because there were at least two wear indications that had greater than 10 percent growth and were greater than 40 percent throughwall. These wear indications were located in the tube where the tube intersects the vertical straps, diagonal bars and eggcrates. The maximum depth of a wear scar was 44 percent throughwall.
- The axial indication identified in the Row 2 U-bend was located in the flank of the tube at the apex.
- The RPC probe inspection of the top of the tubesheet in SG B was expanded from a scope of 50 percent to 100 percent of the tubes because one circumferential indication was identified in the initial scope. A total of five circumferential indications were identified at the top of the tubesheet in SG B. The licensee indicated that they all were very small (e.g., maximums of 104° circumferentially and 0.28 volts from the RPC probe, and all were estimated to be less than 50 percent throughwall) and did not exceed the Palisades in-situ pressure test screening criteria.

ENCLOSURE

- The licensee identified two axial outside diameter stress-corrosion cracks (ODSCC) during the hot leg, top-of-tubesheet RPC probe inspection. One axial flaw was 0.33 inches long and 0.3 volts based on RPC probe data, and the other was 0.18 inches long and 0.18 volts based on RPC probe data. These flaws were also very small and did not exceed the Palisades in-situ pressure test screening criteria.
- All indications identified during the hot leg top-of-tubesheet RPC probe inspection were located within, or associated with, the expansion transition region of the tube.
- In response to issue 5 of the April 4, 2003, letter, which requests that NMC provide a summary of 1) the number of indications identified to date and 2) each degradation mode and SG tube location, the licensee summarized its answer in a table (provided in the attachment). The data in the table contains the plugging summary based on all tubes plugged beginning in the preservice examination through the 2001 SG examination. Data from the ongoing 2003 SG examination was not included in the totals. The row titled "Volumetric (not corrosion related)" consists of volumetric indications with no loose parts/foreign objects present. The row titled "Wear due to loose parts/foreign objects" consists of volumetric indications where suspect loose parts/foreign objects are still present. The licensee plugs both of these categories of wear indications upon detection (i.e., no sizing, other than for condition monitoring).
- Axial primary water stress-corrosion cracking (PWSCC) was detected in the tubesheet region in a tube which was not expanded for the entire length of the tubesheet (i.e., the tube contains a short tack roll at the bottom of the tube within the tubesheet, but was not expanded the remaining length of the tubesheet). The axial flaw was located in the tack roll.

At the time the first call took place, 9 tubes requiring plugging were identified in SG A and 21 tubes requiring plugging were identified in SG B.

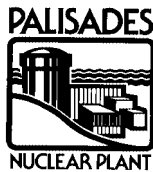
The NRC staff did not identify any issues requiring follow-up, but requested NMC to contact the NRC if, during the remaining SG inspection activities, NMC identified a new degradation mechanism, leakage during an in-situ pressure test, or failure of an in-situ pressure test.

NMC requested a follow-up call for April 10, 2003, due to identification of a new degradation mechanism. At the time of this call, the SG inspections on both steam generators were complete and SG tube plugging was ongoing in SG A. The licensee indicated that the new degradation mechanism was axial PWSCC in the tube within the tubesheet (i.e., below the expansion transition region of the tube). One axial flaw was identified in SG A. The axial flaw was located approximately 2 inches below the hot leg top-of-the-tubesheet and was identified during the hot leg top-of-tubesheet inspection with the RPC probe. The flaw size was estimated to be 0.25 inches long and 1.7 volts. One hundred percent of the tubes in SG A were inspected with a RPC probe in the top-of-tubesheet region (i.e., the scope of this inspection had already been expanded from 25 percent to 100 percent since the April 4<sup>th</sup> conference call, due to identification of a circumferential flaw in this region of SG A).

The NRC staff has previously raised a concern with other licensees about whether identification of a flaw in a tube below the expansion transition region should result in expansion of the inspection scope (i.e., more than 5 inches below the top of the tubesheet) with a rotating probe. The NRC staff's position was that finding of flaws in the 5-inch zone below the top of the

tubesheet clearly indicates the potential for similar cracks to be present deeper within the thickness of the tubesheet. Given the clear potential for similar cracks deeper into the thickness of the tubesheet, and because the bobbin probe (the only inspection technique utilized in that region) is not qualified to detect flaws in that region, the NRC staff raised concerns whether an inspection technique capable of reliably detecting flaws should be utilized. Given the potentially generic nature of this issue, the NRC staff is addressing the issue generically with the industry. The NRC staff did communicate to NMC that the staff has reviewed submittals from several licensees with the same technical bases as that identified by NMC and had raised a number of questions related to the technical bases for limiting the inspections in this region. NMC indicated it was aware of the questions raised by the NRC staff and that the industry was addressing them. Given that only one small indication was identified below the expansion transition region at Palisades, and that 100 percent of the tubes in both SGs were inspected, the NRC staff determined that no additional follow-up was needed on this issue at this time.

Attachment: Material Provided by NMC



## **DRAFT TALKING POINTS FOR NRC TELECON 04/04/2003**

### **PALISADES NUCLEAR PLANT STEAM GENERATOR STATUS REPORT**

- E-50A Scope:**
- 100% complete, 25% bobbin scope expanded to 45%
  - 20% complete, 25% RPC top of tubesheet
  - 100% complete, 100% RPC row 1-3 u-bend
  - 10% complete, 40% freespan dings > 5 volts
  - 50% complete, 100% tube plugs, hot leg left
- E-50A Status:**
- 6 wear indications > 40%
  - 1 axial indication row 2 U-bend
  - 2 volumetric indications top of tubesheet
  - 25 pounds removed sludge lancing – wet weight
  - 9 tubes requiring plugging in Steam Generator E-50A
- E-50B Scope:**
- 100% complete, 50% bobbin scope
  - 100% complete, 50% RPC top of tubesheet expanded to 100%
  - 100% complete, 25% RPC row 1-2 u-bend
  - 100% complete, 29% freespan dings > 5 volts
  - 100% complete, 100% tube plugs
- E-50B Status:**
- 5 circumferential indications top of tubesheet
  - 2 axial indications top of tubesheet
  - 1 axial indication tubesheet non-expanded tube
  - 9 volumetric indications top of tubesheet
  - 3 wear indication > 40%
  - 1 restricted tube in plus point RPC able to bobbin test
  - 1 non-expanded required hard rolling before plugging
  - 9 tubes stabilized all at top of tubesheet
  - 16 pounds removed sludge lancing – wet weight
  - 21 tubes total plugged in Steam Generator E-50B