

July 20, 2006

Mr. Paul A. Harden  
Site Vice President  
Nuclear Management Company, LLC  
Palisades Nuclear Plant  
27780 Blue Star Memorial Highway  
Covert, MI 49043-9530

SUBJECT: PALISADES PLANT — REVIEW OF THE 2004 STEAM GENERATOR TUBE  
INSPECTION REPORTS (TAC NO. MC8606)

Dear Mr. Harden:

Nuclear Management Company, LLC's (NMC's) letters of October 20, 2004, October 4, 2005, and March 13, 2006, submitted information related to the steam generator (SG) tube inspections at the Palisades Nuclear Plant for its fall 2004 outage. In addition to these reports, the U.S. Nuclear Regulatory Commission (NRC) staff's letter of March 1, 2005, summarized additional information received from NMC concerning its 2004 SG tube inspections.

We have reviewed this information, and conclude that NMC provided the information required by the Palisades' technical specifications. In addition, we find that there are no technical issues that warrant follow-up action at this time. Enclosed is a summary of our review.

Sincerely,

*/RA/*

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

Docket No. 50-255

Enclosure:  
Summary of NRC's Review

cc w/encl: See next page

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NAME	LPadovan	THarris	LRaghavan
DATE	07/20/06	07/19/06	07/20/06

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Palisades Plant

cc:

Robert A. Fenech, Senior Vice President  
Nuclear, Fossil, and Hydro Operations  
Consumers Energy Company  
1945 Parnall Rd.  
Jackson, MI 49201

Arunas T. Udrys, Esquire  
Consumers Energy Company  
1 Energy Plaza  
Jackson, MI 49201

Regional Administrator, Region III  
U.S. Nuclear Regulatory Commission  
Suite 210  
2443 Warrenville Road  
Lisle, IL 60532-4351

Supervisor  
Covert Township  
P. O. Box 35  
Covert, MI 49043

Office of the Governor  
P. O. Box 30013  
Lansing, MI 48909

U.S. Nuclear Regulatory Commission  
Resident Inspector's Office  
Palisades Plant  
27782 Blue Star Memorial Highway  
Covert, MI 49043

Michigan Department of Environmental Quality  
Waste and Hazardous Materials Division  
Hazardous Waste and Radiological  
Protection Section  
Nuclear Facilities Unit  
Constitution Hall, Lower-Level North  
525 West Allegan Street  
P.O. Box 30241  
Lansing, MI 48909-7741

Michigan Department of Attorney General  
Special Litigation Division  
525 West Ottawa St.  
Sixth Floor, G. Mennen Williams Building  
Lansing, MI 48913

Michael B. Sellman  
President and Chief Executive Officer  
Nuclear Management Company, LLC  
700 First Street  
Hudson, MI 54016

Jonathan Rogoff, Esquire  
Vice President, Counsel & Secretary  
Nuclear Management Company, LLC  
700 First Street  
Hudson, WI 54016

Douglas E. Cooper  
Senior Vice President - Group Operations  
Palisades Nuclear Plant  
Nuclear Management Company, LLC  
27780 Blue Star Memorial Highway  
Covert, MI 49043

Stephen T. Wawro, Director  
of Nuclear Assets  
Consumers Energy Company  
Palisades Nuclear Plant  
27780 Blue Star Memorial Highway  
Covert, MI 49043

Laurie A. Lahti, Manager  
Regulatory Affairs  
Nuclear Management Company, LLC  
Palisades Nuclear Plant  
27780 Blue Star Memorial Highway  
Covert, MI 49043

November 2005

SUMMARY OF NRC REVIEW OF THE 2004  
STEAM GENERATOR TUBE INSPECTION REPORTS  
NUCLEAR MANAGEMENT COMPANY, LLC  
PALISADES PLANT  
DOCKET NO. 50-255

1.0 INTRODUCTION

Nuclear Management Company, LLC's (NMC's) letters of October 20, 2004, October 4, 2005, and March 13, 2006, submitted information related to the steam generator (SG) tube inspections at the Palisades Nuclear Plant for its fall 2004 outage. In addition to these reports, the U.S. Nuclear Regulatory Commission (NRC) staff's letter of March 1, 2005, summarized additional information received from NMC concerning its 2004 SG tube inspections. On May 30, 2006, NMC provided clarifying information (by electronic mail) regarding its fall 2004 SG tube inspection summaries. The clarifying information is included in the following evaluation.

2.0 EVALUATION

Palisades Nuclear Plant has two Combustion Engineering Model 2530 replacement SGs. Each SG has 8,219 mill-annealed, Alloy-600 tubes. The tubes have an outside diameter of 3/4-inch, and a wall thickness of 0.042-inch. The tubes are supported at various locations by stainless steel eggcrate lattice type tube supports, diagonal straps and vertical straps. The tubes were expanded through the full depth of the tubesheet using an explosive process.

NMC provided the scope, extent, methods and results of its SG tube inspections in the documents referenced above. In addition, NMC described corrective actions (i.e., tube plugging) taken in response to the inspection findings.

As a result of the review of these reports, the NRC staff has the following comments and observations:

- In 1999, one tube (in row 99, column 140 in SG-B) was identified with a deep (67 percent through-wall) wear scar. The wear was associated with the wrap-around bar (tie bar). The tube was plugged, but not stabilized. NMC concluded that this tube would not sever based on a stabilization evaluation. Following the 1999 inspection, it was concluded that bobbin inspections of all surrounding tubes should be performed. If wear greater than 20 percent through-wall, or growth of greater than 10 percent through-wall, per cycle is reported, then the tubes in this area should be stabilized. NMC also concluded that rotating-probe inspections should be performed on the adjacent tubes during future outages. During the fall 2004 inspection, the four adjacent tubes surrounding row 99, column 140 were

ENCLOSURE

inspected for the first time with a rotating probe (+Point™ coil). These tubes were inspected with a rotating probe from the top eggcrate support (05H) through vertical strap VS1, which included the entire square-bend region on the hot-leg side. As a result of these inspections, one tube (in row 99, column 138) was identified with a wear indication measuring 13 percent through-wall, as reported from the bobbin coil examinations. The indication was at the diagonal bar on the hot-leg side of the SG. The rotating probe inspections confirmed this indication as wear. During the 2006 inspection, the wear indication at tube row 99, column 138 was 17 percent through-wall, and was associated with the diagonal bar (i.e., not associated with row 99, column 140). Therefore, no plugging was required.

- NMC identified six crack-like indications in the following regions of the tube:
  - freespan (three indications)
  - square bend (two indications)
  - eggcrate support (one indication)

All of these indications were on the hot-leg side of the SG, with the exception of the indication at the eggcrate support, and one indication in the square bend. The indications that occurred in the square bend had dings with voltages of 1.58 and 2.12 volts. All indications were detected with a bobbin-coil probe.

- The +Point™ inspection revealed two tubes with indications of wear coincident with a dent signal. The bobbin coil did not detect the potential wear signal (due to the shallow depth of the wear and the influence of the dent). The wear was not located within the dent (i.e., they were separated circumferentially).

### 3.0 CONCLUSION

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