

May 4, 2004

Mr. Roy A. Anderson
President & Chief Nuclear Officer
PSEG Nuclear, LLC - X04
Post Office Box 236
Hancocks Bridge, NJ 08038

SUBJECT: SALEM NUCLEAR GENERATING STATION, UNIT NOS. 1 AND 2, REVIEW OF
INSERVICE INSPECTION REPORTS FOR STEAM GENERATOR TUBE
INSPECTIONS CONDUCTED DURING THE 2002 REFUELING OUTAGES
(TAC NOS. MB8098 AND MB8099)

Dear Mr. Anderson:

By letter dated February 27, 2003, PSEG Nuclear LLC (PSEG) submitted information associated with the 2002 steam generator (SG) tube inspections performed at Salem Nuclear Generating Station (Salem), Unit Nos. 1 and 2. This information was submitted in accordance with Technical Specification (TS) 6.9.1.5.b. Additional information related to the 2002 SG tube inspections was provided during a telephone conference call in April 2002, and in PSEG letters dated May 2, 2002, November 5, 2002, and January 7, 2004.

As discussed in the enclosed evaluation, the Nuclear Regulatory Commission staff concluded that PSEG provided the information required by the Salem TSs and that no additional follow-up is required at this time. This completes the NRC staff's efforts under TAC Nos. MB8098 and MB8099.

If you have any questions regarding this matter, please contact me at (301) 415-1427.

Sincerely,

/RA/

Daniel S. Collins, Project Manager, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-272 and 50-311

Enclosure: As stated

cc w/encl: See next page

May 4, 2004

Mr. Roy A. Anderson
President & Chief Nuclear Officer
PSEG Nuclear, LLC - X04
Post Office Box 236
Hancocks Bridge, NJ 08038

SUBJECT: SALEM NUCLEAR GENERATING STATION, UNIT NOS. 1 AND 2, REVIEW OF
INSERVICE INSPECTION REPORTS FOR STEAM GENERATOR TUBE
INSPECTIONS CONDUCTED DURING THE 2002 REFUELING OUTAGES
(TAC NO. MB8098 AND MB8099)

Dear Mr. Anderson:

By letter dated February 27, 2003, PSEG Nuclear LLC (PSEG) submitted information associated with the 2002 steam generator (SG) tube inspections performed at Salem Nuclear Generating Station (Salem), Unit Nos. 1 and 2. This information was submitted in accordance with Technical Specification (TS) 6.9.1.5.b. Additional information related to the 2002 SG tube inspections was provided during a telephone conference call in April 2002, and in PSEG letters dated May 2, 2002, November 5, 2002, and January 7, 2004.

As discussed in the enclosed evaluation, the Nuclear Regulatory Commission staff concluded that PSEG provided the information required by the Salem TSs and that no additional follow-up is required at this time. This completes the NRC staff's efforts under TAC Nos. MB8098 and MB8099.

If you have any questions regarding this matter, please contact me at (301) 415-1427.

Sincerely,

/RA/

Daniel S. Collins, Project Manager, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-272 and 50-311

Enclosure: As stated

cc w/encl: See next page

DISTRIBUTION:

PUBLIC	PDI-2 Reading	JClifford	LLund
ACRS	CRaynor	MMurphy	GMeyer, RGN-I
OGC	RFretz	KKarwoski	RLorson, RGN-I

ADAMS Accession Number: ML040800007

* Input provided. No major changes made.

OFFICE	PDI-1/PM	PDI-2/LA	EMCB/SC*	PDI-2/SC
NAME	DCollins	CRaynor	LLund	JClifford
DATE	4/14/04	4/08/04	01/26/04	4/24/04

OFFICIAL RECORD COPY

Salem Nuclear Generating Station, Unit Nos. 1 and 2

cc:

Mr. A. Christopher Bakken, III
Senior Vice President - Nuclear Operations
PSEG Nuclear - X15
P.O. Box 236
Hancocks Bridge, NJ 08038

Mr. Michael H. Brothers
Vice President - Site Operations
PSEG Nuclear - X15
P.O. Box 236
Hancocks Bridge, NJ 08038

Mr. John T. Carlin
Vice President - Nuclear Assessments
PSEG Nuclear - N10
P.O. Box 236
Hancocks Bridge, NJ 08038

Mr. David F. Garchow
Vice President - Eng/Tech Support
PSEG Nuclear - N28
P.O. Box 236
Hancocks Bridge, NJ 08038

Mr. Steven Mannon
Acting Manager - Licensing
PSEG Nuclear - N21
P.O. Box 236
Hancocks Bridge, NJ 08038

Jeffrie J. Keenan, Esquire
PSEG Nuclear - N21
P.O. Box 236
Hancocks Bridge, NJ 08038

Ms. R. A. Kankus
Joint Owner Affairs
PECO Energy Company
Nuclear Group Headquarters KSA1-E
200 Exelon Way
Kennett Square, PA 19348

Lower Alloways Creek Township
c/o Mary O. Henderson, Clerk
Municipal Building, P.O. Box 157
Hancocks Bridge, NJ 08038

Dr. Jill Lipoti, Asst. Director
Radiation Protection Programs
NJ Department of Environmental
Protection and Energy
CN 415
Trenton, NJ 08625-0415

Brian Beam
Board of Public Utilities
2 Gateway Center, Tenth Floor
Newark, NJ 07102

Regional Administrator, Region I
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Senior Resident Inspector
Salem Nuclear Generating Station
U.S. Nuclear Regulatory Commission
Drawer 0509
Hancocks Bridge, NJ 08038

NUCLEAR REGULATORY COMMISSION STAFF'S REVIEW OF
THE 2002 STEAM GENERATOR TUBE INSERVICE INSPECTION REPORTS
SALEM NUCLEAR GENERATING STATION UNIT NOS. 1 AND 2
DOCKET NOS. 50-272 AND 50-311

By letter dated February 27, 2003 (ML030630790)¹, PSEG Nuclear, LLC (PSEG or the licensee) submitted information associated with the 2002 steam generator (SG) tube inspections performed at the Salem Nuclear Generating Station (Salem), Unit Nos. 1 and 2. This information was submitted in accordance with Technical Specification (TS) 6.9.1.5.b of Appendix A to Facility Operating License Nos. DPR-70 and DPR-75. Additional information related to the 2002 SG tube inspections was provided during a telephone conference call in April 2002 (ML021540110), and in PSEG letters dated May 2, 2002 (ML021330304), November 5, 2002 (ML023180283), and January 7, 2004.

The U.S. Nuclear Regulatory Commission (NRC) staff reviews the information provided in the TS annual reports consistent with its regulatory oversight role to confirm that licensees' SG tube inspection programs are in accordance with NRC regulations and industry guidelines. In addition, a review of these reports supports NRC staff reviews of other types of licensee submittals, provides background information to facilitate the exchange of information with licensees conducting SG tube inspections, and provides background information for regional inspector use in inspection preparation.

Based on the NRC staff's review of the above mentioned documents, the staff requested additional information in three areas. PSEG responded to the request for additional information (RAI) dated November 12, 2003 (ML033160082), in a letter dated January 7, 2004 (ML040140289).

The scope and results of the licensee's inspections are contained in the documents referenced above. Based on a review of these documents, the NRC staff concludes that PSEG provided the information required by its TSs. In addition, the NRC staff did not identify any technical issues that warranted additional follow-up action at this time; however, the staff notes the following observations regarding the licensee's inspection and assessments:

1. In response to question 1 of the NRC staff's RAI for Salem, Unit No. 1, PSEG indicated there were inconsistencies in the industry guidelines on the inspection requirements for plugs. Namely, some plugs require visual examination while other plugs require eddy current examination. Although the staff did not identify any specific issues with the licensee's 2002 practice of not performing the volumetric examinations of the plugs (given the plug's service life and the "enhanced" material), the NRC staff notes that

¹ Documents with ML numbers can be viewed in the NRC's Agencywide Documents Access and Management System (ADAMS) at www.nrc.gov/reading-rm/adams.html

Enclosure

plugs may degrade with time. As such, eddy current inspections performed on "inspectable" plugs may give an early indication of a condition adverse to quality which may not be detectable by visual means.

2. In response to question 2 of the NRC staff's RAI for Salem, Unit No. 1, the licensee provided their basis for the use of the differential method for sizing wear indications at anti-vibration bars. PSEG's response compared the root mean square error (RMSE) for the two techniques against the RMSE for a correlation made between the two techniques. The RMSE values were consistent. The purpose of the staff's question was to determine whether the new method was providing accurate measurements of the depth of degradation. From the licensee's response, it appears that the new method (i.e., the differential method) may have consistently undercalled the indication's depth (as compared to the depth determined from the absolute channel). As a result, this appears to draw into question whether the original or the newer method results in accurate determinations of the depth of the degradation. Since the licensee indicated that the differences in sizes between the two methods were small, the staff did not request the licensee to supplement their response at this time. Presumably, any bias in the size estimates could be accounted for in sizing the degradation and in assessing whether the tube has adequate integrity.
3. In response to question 4 of the staff's RAI for Salem, Unit No. 1, the licensee provided their basis for screening manufacturing anomalies. Their basis primarily relies on the use of a more corrosion resistant material, namely thermally-treated Alloy 600 (a second generation material). In their response, PSEG indicated that no free-span degradation has been identified in any second generation material, the Salem SGs have less service life than others, and that PSEG has found no degradation to date. The staff notes the following which should be considered in future inspections: (1) the SG with the oldest service life does not always experience degradation first (e.g., cracking at the tube supports in the Seabrook thermally-treated Alloy 600 tubes), (2) past inspection results indicating no degradation does not preclude future degradation, (3) the bobbin data from the low frequency absolute channel may be helpful in detecting long free-span indications, and (4) flaws which exceed the plugging limit may have voltages less than the screening criteria previously used to determine when a rotating probe exam should be performed at manufacturing indications. (Refer to NRC Information Notice 2003-05)
4. Salem, Unit No. 2, completed another SG tube inspection during the fall 2003 refueling outage. During the outage, the NRC staff had several conference calls with the licensee to discuss the scope and results of the inspections (a summary of these calls is publicly available in ADAMS un accession number ML040800008). During these calls, the licensee was aware of the NRC staff's RAI. Recognizing that the licensee recently completed another SG tube inspection at Unit No. 2 in 2003, the staff did not identify any issues with the licensee's 2002 SG tube inspections requiring follow-up. The NRC staff plans to review the licensee's 2003 inspection results when they are submitted to the NRC, in accordance with the requirements of the Salem, Unit No. 2 TSs.