



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

March 25, 2021

Mr. Eric Carr  
President and Chief Nuclear Officer  
PSEG Nuclear LLC - N09  
P.O. Box 236  
Hancocks Bridge, NJ 08038

SUBJECT: SALEM NUCLEAR GENERATING STATION, UNIT NO. 1 - REVIEW OF THE  
SPRING 2020 STEAM GENERATOR TUBE INSPECTION REPORT  
(EPID L-2020-LRO-0057)

Dear Mr. Carr:

By letters dated September 17, 2020 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20261H589), as supplemented by letter dated February 25, 2021 (ADAMS Accession No. ML21056A435), PSEG Nuclear LLC (PSEG, the licensee) submitted information summarizing the results of the spring 2020 steam generator tube inspections at Salem Nuclear Generating Station, Unit No. 1.

The U.S. Nuclear Regulatory Commission staff has completed its review of PSEG's submittals, as documented in the enclosed evaluation. The staff concludes that the licensee has provided the information required by the technical specifications and that no additional follow-up is required at this time.

If you have any questions, please contact me at 301-415-4125 or [James.Kim@nrc.gov](mailto:James.Kim@nrc.gov).

Sincerely,

/RA/

James S. Kim, Project Manager  
Plant Licensing Branch I  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-272

Enclosure:  
Review of Report

cc: Listserv

OFFICE OF NUCLEAR REACTOR REGULATION  
REVIEW OF THE SPRING 2020 STEAM GENERATOR TUBE INSPECTION REPORT  
PSEG NUCLEAR LLC  
SALEM NUCLEAR GENERATING STATION, UNIT NO. 1  
DOCKET NO. 50-272

By letters dated September 17, 2020 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20261H589), as supplemented by letter dated February 25, 2021 (ADAMS Accession No. ML21056A435), PSEG Nuclear LLC (PSEG, the licensee) submitted information summarizing the results of the spring 2020 steam generator (SG) inspections at Salem Nuclear Generating Station (Salem), Unit No. 1. These SG inspections were performed during a forced unit shutdown. On February 25, 2020, the licensee identified rising activity in the SG14 N-16 and blowdown radiation monitors and the main condenser off-gas radiation monitor. The licensee initiated a shutdown because the primary-to-secondary leakage continued to increase throughout the day.

Salem, Unit No. 1, has four Westinghouse Model F SGs, all containing 5,626 U-bend thermally treated Alloy 600 tubes. Each tube has a nominal outside diameter of 0.688 inches and a nominal wall thickness of 0.040 inches. During SG fabrication, the tubes were hydraulically expanded at both ends over the full depth of the tubesheet. The tubesheet was drilled on a square pitch with 0.98-inch spacing. The U-bends in rows 1 through 10 were stress-relieved after bending. Eight Type 405 stainless steel support plates, which have broached quatrefoil holes, support the vertical section of the tubes, and chrome-plated Alloy 600 anti-vibration bars support the U-bend section of the tubes.

The licensee provided the scope, extent, methods, and results of its 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.

After reviewing the information provided by the licensee, the U.S. Nuclear Regulatory Commission (NRC) staff has the following comments/observations:

- On March 10, 2020, the NRC held a teleconference with the licensee to learn more about the SG14 primary-to-secondary leakage discovery and eddy current test (ECT) inspections. The licensee initially identified five tubes in SG14 with loose parts indications. The licensee was scheduled to perform SG inspections in fall 2020 but due to the forced outage all four Unit No. 1 SGs were inspected.
- The licensee provided additional information to the NRC during a teleconference on March 16, 2020. The licensee confirmed that the initial ECT of the five tubes was performed using a Bobbin probe. Following removal of the loose part, the licensee performed additional ECT using a +Point™ probe and performed in situ pressure testing on three of the five tubes. Only four of the five tubes initially identified were confirmed to have wear indications.

Enclosure

- The tube in row 57 column 54 (R57C54) of SG14 was identified as the tube responsible for primary-to-secondary side leakage initially identified on February 25, 2020. Full-length in situ pressure tests were performed on the tubes in R57C54, R58C54 and R58C55, of SG14. All tubes eddy current inspected or in-situ pressure tested met the tube integrity performance criteria in Technical Specification 6.8.4.i.b.
- Thirty-eight tubes were plugged due to wear with anti-vibration bars.
- The fatigue evaluation of the 10 tapered welded plugs was completed by Framatome. The 10 plugs satisfy the stress fatigue requirements for the anticipated number of transients and cycles considered in the renewed operating license. The licensee is monitoring fatigue cycles through the fatigue monitoring program.

Based on a review of the information provided, the NRC staff concludes that the licensee provided the information required by its technical specifications. In addition, the staff concludes that there are no technical issues that warrant additional follow-up action at this time, since 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.

Principal Contributor: Andrew Johnson

Date: March 25, 2021

E. Carr

- 2 -

SUBJECT: SALEM NUCLEAR GENERATING STATION, UNIT NO. 1 - REVIEW OF THE  
SPRING 2020 STEAM GENERATOR TUBE INSPECTION REPORT  
(EPID L-2020-LRO-0057) DATED MARCH 25, 2021

**DISTRIBUTION:**

PUBLIC

PM File Copy

RidsACRS\_MailCTR Resource

RidsNrrDnrINcsg Resource

RidsNrrDorLpl1 Resource

RidsNrrLAJBurkhardt Resource

RidsNrrPMSalem Resource

RidsRgn1MailCenter Resource

SBloom, NRR

AJohnson, NRR

GMakar, NRR

LTerry, NRR

MHaire, OEDO

MMcCoppin, OEDO

PKlein, NRR

**ADAMS Accession No.: ML21078A000**

\*by memorandum

|        |                  |                  |                    |
|--------|------------------|------------------|--------------------|
| OFFICE | NRR/DORL/LPL1/PM | NRR/DORL/LPL1/LA | NRR/DNRL/NCSEG/BC* |
| NAME   | JKim             | JBurkhardt       | SBloom             |
| DATE   | 3/19/2021        | 3/19/2021        | 3/10/2021          |
| OFFICE | NRR/DORL/LPL1/BC | NRR/DORL/LPL1/PM |                    |
| NAME   | JDanna           | JKim             |                    |
| DATE   | 3/25/2021        | 3/25/2021        |                    |

**OFFICIAL RECORD COPY**