



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

December 30, 2015

Mr. Bryan C. Hanson  
President and Chief Nuclear Officer  
Exelon Nuclear  
4300 Winfield Road  
Warrenville, IL 60555

SUBJECT: SUMMARY OF NOVEMBER 9, 2015, CONFERENCE CALL WITH EXELON  
AND AREVA REGARDING THREE MILE ISLAND NUCLEAR STATION  
FALL 2015 STEAM GENERATOR TUBE INSERVICE INSPECTION  
(CAC NO. MF6779)

Dear Mr. Hanson:

On November 9, 2015, the U.S. Nuclear Regulatory Commission (NRC) staff participated in a conference call with representatives from Exelon Generation Company, LLC and AREVA Inc. regarding the ongoing steam generator tube inspection activities at the Three Mile Island Nuclear Station, Unit 1, during the fall 2015 outage. A conference call summary and a list of attendees are provide as Enclosures 1 and 2, respectively.

The licensee provided slides, dated November 9, 2015, which contain information related to the fall 2015 outage inspections, and are available in the Agencywide Documents Access and Management System under Accession No. ML15327A081.

This summary completes the NRC staff efforts associated with CAC No. MF6779. If you have any questions, please contact me at (301) 415-1022 or [Robert.Gladney@nrc.gov](mailto:Robert.Gladney@nrc.gov).

Sincerely,

A handwritten signature in black ink, appearing to read "Robert L. Gladney", with a stylized flourish at the end.

Robert L. Gladney, Project Manager  
Plant Licensing Branch I-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-289

Enclosure:

1. Summary of Conference Call
2. List of Attendees

cc w/enclosures: Distribution via Listserv

SUMMARY OF NOVEMBER 9, 2015, CONFERENCE CALL  
REGARDING THREE MILE ISLAND NUCLEAR STATION, UNIT 1  
FALL 2015 STEAM GENERATOR TUBE INSPECTION RESULTS

**Introduction**

By letter dated October 9, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15280A127), the U.S. Nuclear Regulatory Commission (NRC) staff notified Exelon Generation Company, LLC (Exelon or the licensee) that a conference call had been arranged. The conference call discussed the ongoing results of the steam generator (SG) tube inspections to be conducted during the upcoming fall 2015 refueling outage (RFO) for the Three Mile Island Nuclear Station, Unit 1 (TMI-1). As indicated in the letter, this call occurred after the majority of the tubes had been inspected, but before the SG inspection activities had been completed. A list of discussion points was enclosed with the letter to facilitate this upcoming call.

On November 9, 2015, the NRC staff participated in this conference call with representatives from Exelon and AREVA Inc. (AREVA). To support the conference call, the licensee provided slides, dated November 9, 2015, which contain information related to the fall 2015 outage inspections, and are available under ADAMS Accession No. ML15327A081. This summary provides information regarding the ongoing results of the inspections during the fall 2015 outage SG tube inspections at the time of the conference call.

Following the completion of their SG tube inspections, licensees are required to submit summary reports at a frequency defined by their technical specifications (TSs). The NRC formally reviews all SG inspection summary reports submitted by licensees in accordance with the plant TS requirements. TMI-1 TS 6.9.6, "Steam Generator Tube Inspection Report," states, in part, that, "A report shall be submitted within 180 days after the average reactor coolant temperature exceeds 200°F following completion of an inspection performed in accordance with Section 6.19, Steam Generator (SG) Program."

**Background**

TMI-1 has two AREVA-enhanced once-through SGs that were installed in 2010. Each SG has 15,597 thermally-treated Alloy 690 tubes with a nominal outside diameter of 0.625 inches and a nominal wall thickness of 0.037 inches. The tubes were hydraulically expanded for the full length of the tubesheet and are supported by Type 410M stainless steel tube support plates.

The slides that the licensee provided were the documents used for the conference call. Undefined abbreviations used in the document include:

- 01S – Tube Support Plate 01S
- 690TT – Thermally Treated Alloy 690
- DNG – Ding
- DNT – Dent
- ECT – Eddy Current Testing
- EFPY – Effective Full Power Year
- EPRI – Electric Power Research Institute
- LTS – Lower Tubesheet
- MRPC – Motorized Rotating Pancake Coil
- N/A – Not Applicable
- NOP – Normal Operating Pressure
- NOPD – Normal Operating Pressure Differential
- NRC – U.S. Nuclear Regulatory Commission
- OA – Operational Assessment
- OD – Outside Diameter
- OTSG – Once-Through Steam Generator
- POS – Probability of Survival
- psid – pounds per square inch differential
- psig – pounds per square inch gauge
- PSLR – Primary-to-Secondary Leakage Rate
- Q&A – Question and Answer
- SGMP – Steam Generator Management Program
- SI – Structural Integrity
- SS – Stainless Steel
- T1R20 – Three Mile Island, Unit 1 Refueling Outage 20
- T1R21 – Three Mile Island, Unit 1 Refueling Outage 21
- Tech Spec – Technical Specification
- T<sub>hot</sub> – Hot Leg Temperature
- TMI-1 – Three Mile Island, Unit 1
- TS – Tubesheet
- TSP – Tube Support Plate
- T-T – Tube-to-Tube
- T-TSP – Tube to TSP
- TTS – Top of the Tubesheet
- TTW – Tube-to-Tube Wear
- TWD – Through-Wall Depth
- V – Volt

### **Conference Call on November 9, 2015**

During this call, the licensee utilized the slides provided (see earlier sections of this summary) as talking points and as the primary source of the information discussed. These slides also provided information regarding the status of the inspections and the results as of the day of the call (November 9, 2015). At the time of the call, data for the tube inspections in SG A and SG B were approximately 86 percent and 96 percent acquired, respectively.

As indicated by the licensee, the scope of inspections planned included a full-length inspection of 100 percent of the SG tubes using a bobbin coil probe; diagnostic exams and tubing plugging as needed; and a 2-tube periphery array combo probe exam for loose parts. The licensee stated that no primary-to-secondary leakage had been detected during operating cycle (Cycle 20), no secondary side pressure tests had been conducted during the outage, and no exceptions or deviations to industry guidelines had been taken during the outage.

As shown in the slides, the licensee provided comparison charts to show the number of indications and other information, such as wear distribution and repeat indications. The licensee stated that all tubes repaired be stabilized and roll-plugged mechanically per stabilization criteria. The licensee indicated that it planned to plug all tubes with indications greater than or equal to 40 percent through-wall (TW) and that it currently had 25 tubes to be plugged based upon this criteria. (By e-mail dated December 17, 2015, the licensee provided an update to the information presented in the call in which the licensee indicated that 25 tubes met the plugging criteria, but that 134 tubes total were plugged. In addition, the licensee stated, "The additional tubes were plugged to support the Operational Assessment (OA) and provide the station additional margin in the analysis.")

During the call, the licensee indicated that there were currently no indications that exceeded the condition monitoring (CM) limit, and therefore, no in-situ pressure testing was required. The licensee also stated that there were no loose part indications detected and no loose parts to remove. Additionally, the licensee stated that no secondary inspections or maintenance was planned for the fall 2015 outage SG inspections.

The licensee stated that there were no unexpected results from the eddy current inspections that occurred during the outage, and the fall 2015 outage (T1R21) inspection results were within the previous OA projection and were also bounded by the results of the previous outage (T1R20). The licensee indicated that it expected to have the eddy current inspections completed on November 10, 2015, and that any tube plugging that was needed was expected to be completed November 10 - 13, 2015.

In addition to the information provided in the slides, the licensee provided additional information during the call, as summarized below:

- The licensee indicated that the number of new indications identified in SG A during RFO 21 is larger than the number of new indications identified in SG A during RFO 20 and that the overall number of new indications (the total for SG A and SG B) decreased from RFO 20 to RFO 21. The licensee also indicated that the ratio of total new to repeat indications (in SG A and SG B) decreased from approximately 1.7 in RFO 20 to less than 1 in RFO 21.

- The NRC staff noted that the largest repeat indication in SG B of 64 percent TW was within the CM limit band of “58-66%” shown on slide 10 of the presentation. The CM limit band is based on specific flaw sizes (e.g., specific combinations of flaw length and depth). The licensee explained that although this indication was within the CM limit band, the tube has adequate integrity, given the size of the indication. Specifically, given the structural length of this flaw, the CM limit is 67 percent.
- The licensee indicated during the call that approximately 130 tubes were expected to be plugged during RFO 21. In an e-mail from the licensee to the NRC staff dated December 17, 2015, and as discussed previously in this summary, the licensee provided an update in which it was indicated that a total of 134 tubes were plugged during T1R21. In this e-mail, the licensee also indicated that 3 tubes were plugged in SG A and 131 tubes were plugged in SG B.
- The licensee clarified that the “99% POS in the W-axis” refers to meeting a minimum 95 percent probability of survival per Electric Power Research Institute guidelines such that there are no flaws at, or expected to exceed, the CM limit by the next cycle.
- The licensee identified no wear due to loose parts.
- The licensee stated that there were no anomalies or degradation found during the remote channel head and rolled plug inspections.

Based on a review of the information provided, the NRC staff did not identify any issues that required followup action at this time.

The NRC staff indicated that if the final results were significantly different from those as described at the time of the call, or if there were significant issues discovered, the expectation of the licensee is that the NRC would be notified immediately, to which the licensee agreed. The NRC staff also reiterated that the licensee had a TS requirement to submit the 180-day report to the NRC. The licensee indicated that it was aware of this requirement and that it would be met.

LIST OF ATTENDEES

NOVEMBER 9, 2015, CONFERENCE CALL WITH EXELON AND AREVA

THREE MILE ISLAND NUCLEAR STATION, UNIT 1

FALL 2015 STEAM GENERATOR INSPECTIONS

U.S. NUCLEAR REGULATORY COMMISSION

Alan Huynh  
David Werkheiser  
Justin Heinly  
Robert Gladney  
Harold Gray  
Jeff Kulp  
Mel Gray

EXELON

Frank Mascitelli  
Aaron Thorne  
Harry L. Smith  
Mark Torborg  
Tim Heindl  
Lee Friant  
Mike Fitzwater  
Blair Wunderly

AREVA

Victor Newman

December 30, 2015

Mr. Bryan C. Hanson  
President and Chief Nuclear Officer  
Exelon Nuclear  
4300 Winfield Road  
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Sincerely,

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Robert L. Gladney, Project Manager  
Plant Licensing Branch I-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-289

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RidsNrrDeEsgb Resource	HGray, R-I	MGray, R-I
LPL1-2 R/F	MModes, R-I	JKulp, R-I

**ADAMS Accession No.: ML15350A196**

\*by e-mail dated 12/29/2015

OFFICE	LPL1-2/PM	LPL1-2/LA	ESGB/BC*	LPL1-2/BC	LPL1-2/PM
NAME	RGladney	LRonewicz	GKulesa (w/change)	DBroaddus (TLamb for)	RGladney (JLamb for)
DATE	12/29/2015	12/29/2015	12/29/2015	12/30/2015	12/30/2015

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