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Submitted: August 20, 2012

March 15, 2012

MEMORANDUM TO: Gloria J. Kulesa, Chief
Steam Generator Tube Integrity and
Chemical Engineering Branch
Division of Engineering
Office of Nuclear Reactor Regulation

FROM: Christopher A. Hunt, Chemical Engineer ***/RA/***
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SUBJECT: SUMMARY OF THE FEBRUARY 16, 2012, CATEGORY 2 PUBLIC MEETING WITH THE ELECTRIC POWER RESEARCH INSTITUTE (EPRI) AND INDUSTRY TO DISCUSS STEAM GENERATOR ISSUES

The industry's Steam Generator Task Force (SGTF) met with U.S. Nuclear Regulatory Commission (NRC) staff on February 16, 2012, at the Electric Power Research Institute (EPRI) offices in Washington DC. The purpose of the meeting was to discuss a variety of steam generator issues. The topics discussed are summarized in the industry's slides and NRC handout, which are available in the Agencywide Documents Access and Management System (ADAMS) under Accession Number ML12047A296 and ML12058A444 respectively.
The enclosure is a list of those in attendance. This meeting was noticed as a public meeting and the meeting agenda is available in ADAMS under Accession Number ML12031A023.

During the meeting there was discussion on a number of steam generator issues.
These discussions are summarized below:

- Acronyms used in the industry slides include:
  - ANL: Argonne National Laboratory
  - ASAP: As Soon As Possible
  - AVB: Anti-vibration Bar
  - CIRC: Circumferential
  - CLIIP: Consolidated Line Item Improvement
  - DE: Destructive Examination
  - EDM: Electro Discharge Machining
  - EPRI: Electric Power Research Institute
  - Exp Trans: Expansion Transition

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- E&R TAC: Engineering & Regulatory Technical Advisory Committee
- FBH: Flat Bottom Hole
- FDB: Flow Distribution Baffle
- LAR: License Amendment Request
- MA: Mill Annealed
- MHI: Mitsubishi Heavy Industries
- NDE: Non-destructive Examination
- NEI: Nuclear Energy Institute
- NOA: Notice of Availability
- NSAL: Nuclear Safety Advisory Letter
- NSSS: Nuclear Steam Supply System
- ODSCC: Outside Diameter Stress Corrosion Cracking
- OE: Operating Experience
- OEM: Original Equipment Manufacturer
- PWR: Pressurized Water Reactor
- PWSCC: Primary Water Stress Corrosion Cracking
- SCC: Stress Corrosion Cracking
- SG: Steam Generator
- SGDD: Steam Generator Degradation Database
- SGTF: Steam Generator Task Force
- SGMP: Steam Generator Management Program
- TSP: Tube Support Plate
- TSTF: Technical Specification Task Force
- TT: Thermally Treated
- TTS: Top of Tubesheet
- UT: Ultrasonic Testing

- During the discussions on divider plate and tube-to-tubesheet weld cracking, the NRC staff clarified that some plants that had used a version of the Generic Aging Lessons Learned (GALL) report earlier than revision 2 had made commitments regarding inspections/plans to address these issues. Some of these plants may have made commitments to inspect/take action prior to entering the period of extended operation. The NRC staff wanted to ensure that these plant's commitments/schedules were considered in developing the timeline for the industry's projects. The NRC staff inquired whether the U.S. industry was discussing divider plate inspection techniques with foreign utilities/vendors. The U.S. industry indicated that such discussions could take place; however, the US industry has funded a project to investigate the feasibility of inspecting the steam generator channel head from the outside of the steam generator. If this technique is feasible, inspections from inside the steam generator bowl would not be necessary.

- The NRC staff asked whether a comparison of single pass eddy current results to those of the traditional eddy current primary and secondary analysis results was available for the staff to become familiar with the comparison technique. The industry stated that the comparison technique is still in the process of being developed so comparison data is not yet available.

- The NRC staff inquired whether it could have access to the three technical reports referenced in revision 8 of the PWR SG Examination Guidelines (refer to slide 21). The industry agreed to make those reports available at EPRI.

- The industry indicated that additional details concerning the verification of the AVB positioning would be available at the next NRC/SGTF meeting. The industry indicated that it was considering the operating experience at Fessenheim. The industry also indicated that it would develop a list of information that may be useful in evaluating the operating experience from Fessenheim.

- One of the meeting participants indicated that during power operation there have been some deviations over time in the steam generator water level reading at specific monitors at foreign plants with significant steam generator secondary side deposits. This information may be useful in assessing deposit loadings at plants. In addition, some foreign plants will operate at reduced power if a critical level of deposits in the broached holes in the tube support plates is exceeded (because of the loading that may be imposed on the tube support plates if water level oscillations were to occur (e.g., during/following transients)).

- On slide 26, the industry clarified that the 10 foreign plants were plants with steam generators with “advanced” tube materials (i.e., no units with mill annealed Alloy 600 steam generator tube material).

- The industry indicated that it was currently working on the proprietary and non-proprietary versions of the Pressurized Water Reactor (PWR) Primary-to-Secondary Leak Guidelines for submission to the NRC staff.

- On slide 37, the industry clarified that the row entitled “Support Structure Wear” only includes wear on the straight portion of the tubing (i.e., not in the U-bend region of the tube).

- On slide 41, the industry indicated that it removed an “x” from the column associated with outside diameter stress corrosion cracking in the tubesheet region. Following the meeting, the staff reviewed its records which indicated that one plant found an axially

oriented outside diameter stress corrosion crack approximately 0.26-inch below the top of tubesheet at the bottom of expansion transition. The length of the indication was 0.12-inch

- The industry stated that the requirements for performing tube inspections following certain events (seismic, loss of coolant accidents) were not included in the TSTF-449 technical specifications. The NRC staff indicated it would talk to other NRC staff members on why these requirements were not included in TSTF-449 and to try to ascertain why previous guidance documents indicated that tube inspections should be performed following an operating basis earthquake rather than the safe shutdown earthquake. Regarding the performance of inspections following these types of events, the NRC staff indicated that it may be more appropriate to have more detailed guidance on the scope/extent of inspections following these events.

- The NRC staff indicated that it was trying to obtain more information concerning the cladding/base metal degradation observed in the steam generator channel head at a foreign plant (refer to slide 51).

- The NRC staff indicated that additional discussion may be warranted on the timing and orientation of the steam generator during the performance of the pre-service inspection of the steam generator tubes.

- During the meeting, the NRC staff indicated it was considering clarifying the pre-service steam generator tube inspection requirements in an upcoming proposed rule which would revise 10 CFR 50.55a, “Codes and Standards”. The industry inquired about the timing for releasing this proposed rulemaking for public comment. Following the meeting, it was determined that the earliest release for this proposed rulemaking would be the summer of 2012.

- The industry clarified that progress on developing the pre-service inspection requirements in the American Society of Mechanical Engineers (ASME) code should occur during the May ASME Code meeting. The industry needed to solicit support from members in both section III and section XI of the ASME Code.

- The NRC staff indicated it was considering issuing an Information Notice to highlight non destructive examination (NDE) issues associated with the recent operating experience associated with tube-to-tube wear at Arkansas Nuclear One Unit 1 and Three Mile Island Unit 1.

- Regarding the discovery of tube-to-tube wear at two plants, the NRC staff inquired how a single pass automated analysis protocol would have handled such indications (i.e., indications that were not expected).

- The NRC staff indicated that it appeared the industry routinely shared operating experience associated with SG tube degradation; however, the staff indicated it was not familiar with how the industry communicates operating experience associated with secondary side internals degradation and how the plants assess this operating experience. The industry agreed to put together a presentation on secondary side internal degradation and how it is communicated/addressed by the industry.

- Regarding the performance standards for tube integrity, the NRC staff indicated that it was still in the process of reviewing the report submitted by the industry ("Technical Basis for Steam Generator Tube Integrity Performance Acceptance Standards", available on the EPRI website). The industry indicated that the staff should also consider the information presented during a meeting on September 16, 2009 (ML092820119) and the information contained in Section 8.2.3 of the Steam Generator Integrity Assessment Guidelines (ML100480264)

- The NRC staff encouraged the industry to investigate whether a primary-to-secondary leak in a French plant has any implications to U.S. plants. The NRC staff indicated that if they found out more information that could be shared with the U.S. industry that it would provide that information to the industry.

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Project No.: 689

Enclosures:
1. Attendance List

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ADAMS ACCESSION No.:ML12075A223

OFFICE	NRR/DE/ESGB	NRR/DE	NRR/DE/ESGB
NAME	CHunt	KKarwoski(for GKulesa)	GKulesa
DATE	03/15/2012	03/15/2012	03/15/2012

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Attendance List
February 16, 2012, Meeting with the EPRI SGTF and Industry

SGTF/Industry
Helen Cothron, EPRI
Scott A. Redner, XCEL
Herm Lagally, Westinghouse
Anthony Martin, SNC
Steven Brown, Entergy
Russell Lieder, Next Era Energy
Jay Smith, Exelon
Jeff Fleck, AREVA
Richard Maurer, Westinghouse
Viki Armentrout, Dominion
Greg Kammerdeiner, FENOC
Patrick Fabion, PSEG
Damian Testa, Westinghouse
Mark Richter, NEI

Phone Participants
Ed Korkowski, FPL
Tim Thulien, Duke
Eric Blocher, Stars
Parker Downing, Duke
Dick Smith, Structural Integrity Associates
Bud Auvil, Structural Integrity Associates
John Arhar, PG&E
Diane D'Arrigo, Nuclear Information and Resource Service

NRC
Allen Hiser
Gloria Kulesa
Ken Karwoski
Greg Makar
Charles Harris
Andrew Johnson
Christopher Hunt
Rachel Vaucher
Aloysius Obodoako
Seung Min

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