Steam Generator Task Force / NRC Meeting

September 5, 2024

Agenda

1:00 pm	Welcome and Introductions	All Participants
1:10 pm	Opening Remarks	NRC and Industry
1:15 pm	Industry Presentation:	Industry

1. Recently Published Reports
2. Status of Industry Guidance
3. Interim Guidance
4. NEI 03-08 Deviations
5. Recent Operating Experience

Agenda (continued)

2:15 pm	Loss of Tube Integrity at Tube Supports	NRC Industry
3:15 pm	Address Public Questions/Comments	NRC
3:30 pm	Adjourn	NRC

Recently Published Reports
H. Cothron

Steam Generator Pulled Tube Sourcebook, 3002029288, May 2024

- The industry has made significant efforts in the qualification of non-destructive examination techniques for characterizing steam generator tube degradation which reduce the necessity of tube removal. However, there have been tubes pulled since the last revision of this sourcebook (1998).
- The purpose of this sourcebook is to document industry experience and best practices for tube removal and subsequent laboratory examination.
- The report describes the reasons tube removal may be required or warranted for evaluation of flaws or degradation.
- Significant advances in analytical laboratory techniques have taken place over the previous 20 years and have been included for application to removed tube sections.

Framework for Steam Generator Digital Twin Data Storage: Design, Cybersecurity, and Architecture Constraints, 3002029367, June 2024

- This document develops an essential set of recommendations on software architecture and cybersecurity for digital twin deployment for steam generators
  - Highlights significant constraints and proposes strategies to overcome them.
  - The constraints identified derive from two sources: a review of applicable regulations and standards and direct interviews with member utilities.
- The report also proposes the novel concept of a multi-utility framework for steam generator digital twin development which could provide the capability to seamlessly develop and deploy apps that benefit from data sharing from member utilities.

Hydrazine Application in Secondary System of PWR/PHWR: Reevaluation of Hydrazine Requirements, 3002023968, June 2024

- This effort re-examines the technical bases for hydrazine concentration limits to determine if less hydrazine could provide the same degree of protection for the steam generators.

Secondary Side Projects White Paper, 3002030563, July 2024

- This white paper addresses some common questions regarding research conducted by EPRI Steam Generator Management Program regarding secondary side deposit management.
- Publicly available

Investigation of Steam Generator Secondary-Side Degradation Revision 1, 3002029282, August 2024

- This report reviews various designs and provides examples of observed degradation and provides results of surveys performed with utility members regarding inspection frequency, scope, and results.

Hydrazine Alternatives for PWR/PHWR Secondary System: Evaluation of Hydrogen Injection: Final Report, 3002029318, August 2024

- This study evaluates the reductive effect of hydrogen as compared to hydrazine by two measurements. One is electrochemical potential (ECP) measurement in a well-controlled laboratory loop facility, in both the plant start-up and normal operation conditions over a range of oxygen concentrations. The other is reduction rate measurement for copper oxide by ECP in the plant start-up condition with/without oxygen.

Status of Industry Guidelines
K. Thompson

Guideline Title	Current Rev #	Report #	Last Pub Date	Implementation Date(s)	Interim Guidance	Review Date	Comment
SG Integrity Assessment Guidelines	5	3002020909	Dec 2021	1/31/22	None	2025	Small group will be convened to determine if more guidance is needed
EPRI SG In Situ Pressure Test Guidelines	5	3002007856	Nov 2016	8/31/17	None		Revision in progress
PWR SG Examination Guidelines	8	3002007572	June 2016	8/31/17	Published 2019 and 2021 – Included in revision		Revision in progress

Guideline Title	Current Rev #	Report #	Last Pub Date	Implementation Date(s)	Interim Guidance	Review Date	Comments
Primary Water Chemistry Guidelines	7	3002000505	April 2014	1/28/2015		2025	Reviewed 2023 - No revision recommended
Secondary Water Chemistry Guidelines	8	3002010645	Sept 2017	6/27/2018	Published 2019, 2020, 2023	2025	Reviewed in 2024 - No revision recommended
PWR SG Primary-to-Secondary Leakage Guidelines	5	3002018267	Dec 2020	12/22/2021	None	2026	Reviewed in 2024 - No revision recommended

No NEI 03-08 deviations have been reported

Information Letter
K. Thompson

In Situ Pressure Test Guidelines

- Following an in-situ pressure test, SGMP requests data results to validate the voltage screens
- Recent in situ test results were requested and reviewed after the inspection
  - There was no leakage at steam line break so the new data will be added but not affect the screening values
  - For volumetric flaws at supports, there is a 3-volt initial screen for both structural and leakage integrity
    - One flaw that failed the pressure test at 3xNODP was close to the 3-volt initial screen

In Situ Pressure Test Guidelines

- SGMP entered this into the EPRI Corrective Action Program
  - Contacted all tube integrity vendors and SGMP members
  - Found that for volumetric flaws, condition monitoring limits are used as the initial screening rather than voltage screening
  - Took the guideline document down from the website, deleted the initial volumetric screen, and republished
  - Notified everyone that had downloaded the document of the change
  - Guideline committee was formed to revise the guideline
    - Actions include gathering latest TSP data to potentially modify the screen for volumetric indications

Recent Operating Experience
Steve Brown

Issues Reported and SGMP's Actions With Regard to Recent Operating Experience

- Flaws may have been undersized in the 2017 inspection
  - SGMP is discussing interim guidance for the Integrity Assessment Guidelines regarding sizing wear flaws
- Utility reviews of vendor supplied operational assessments
  - The Integrity Assessment Guidelines has the expectation that licensees plan, direct, and evaluate SG examination activities. The licensee oversees not only the contractual, but also the technical aspects of any contracted work.
  - SGMP is discussing additional guidance and tools to assist the utility engineers with review of operational assessments
  - Detailed training is planned for first quarter 2025

Experience with Longer Operating Intervals

- 4 plants have inspected after 4 cycles of operation with no unexpected results
- 2 plants have inspected after 5 cycles of operation with no unexpected results
- 3 plants will be inspecting in fall 2024 after 5 cycles of operation
  - These plants have a good understanding of their growth rates and have trended over multiple cycles

Loss of Tube Integrity At Supports
NRC

Address Public Comments/Questions
NRC

Adjourn

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