

**COMMISSION BRIEFING SLIDES/EXHIBITS**

**BRIEFING ON STATUS OF REVISIONS  
TO THE REGULATORY FRAMEWORK FOR  
STEAM GENERATOR TUBE INTEGRITY**

**MAY 29, 2003**



# **Steam Generator Program**

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# Topics

- **Industry Steam Generator Program Initiative**
- **Technical Specification Improvements**
- **Summary**



# SG Initiative

- **In December of 1997 industry committed to NEI 97-06, *SG Program Guidelines***
  - **Framework of prevention, inspection, evaluation, repair and leakage monitoring measures**
  - **Revision 1 issued January 2001**
- **NRC comments on all revisions**



# SG Initiative

- **Detailed guidance for implementation of NEI 97-06 is provided in EPRI Guidelines**
  - **Inspection, integrity assessment, pressure testing, and water chemistry**
  - **Regularly revised to address new technologies and operating experience**
  - **NRC reviews drafts of Guideline revisions**
- **All PWRs are implementing NEI 97-06**

# **SG Initiative**

- **Industry is not seeking NRC endorsement of NEI 97-06**
  - **Limit industry's ability to change the related documents in response to new information**
  - **Raise questions regarding NRC approval of EPRI Guidelines**
- **Adequate regulatory framework through proposed plant technical specifications and licensee procedures**

# **SG Initiative**

- **EPRI Steam Generator Management Project (SGMP) established in 1977**
  - **Meets three times a year to exchange information**
  - **Evaluates new information, operating experience and provide resolution to technical issues**
  - **Provides real time evaluation and guidance on generic aspects of current SG operational events**
  - **Manages the development and update of the EPRI Guidelines**



# SG Initiative

- **Enhanced industry response to operating experience (OE)**
  - **OE is rapidly communicated**
  - **OE is considered in evaluating inspection plans**
  - **Peer review teams are formed to respond to significant OE**
  - **Interim guidance issued**
  - **Industry guidelines revised**





# **SG Initiative**

- **INPO review visits assess implementation of NEI 97-06**
  - **Teams comprised of industry peers and technical experts**
  - **Completed reviews of all PWRs**
  - **Findings are summarized and used by the SGMP to identify areas for improvement**
  - **Continuing process of improvement**



# SG Initiative

- **Operational performance has improved**
  - **SG tube leak forced outages:**
    - ◆ **1980s ~10 per year**
    - ◆ **1990 – 1994 ~ 5 per year**
    - ◆ **1995 – 2002 ~ 1 per year**
  - **Lost capacity due to SG problems:**
    - ◆ **1980s ~ 4 % per year**
    - ◆ **1990 – 1994 ~ 2.5% per year**
    - ◆ **1995 – 2002 ~ 1.3% per year**

# SG TS Improvements

- **The industry is working with the Staff to develop a regulatory framework for SG tube integrity**
- **Developed technical specifications**
  - **Blend of performance-based and prescriptive elements**
  - **Reference industry SG Program documents**
  - **Allow for improvements in inspection methods and technology**

# **SG TS Improvements**

- **The proposed TS are a significant improvement**
  - **Define a standardized TS that addresses SG tube integrity**
  - **Require a SG program that follows NEI 97-06**
  - **Mandate conformance with defined SG performance criteria**
  - **Encourages innovation by keeping technical details outside of TS**

# SG TS Improvements

- **Allow extended inspection intervals in specific circumstances**
  - ◆ **Differences in tubing material**
  - ◆ **Age of the SGs**
  - ◆ **Performance of the SGs**
- **Require a disciplined approach to SG inspection planning based on**
  - ◆ **Plant specific experience**
  - ◆ **Industry experience**
  - ◆ **Potential degradation**

# **SG TS Improvements**

- **Lead plant (Catawba) submittal on February 25<sup>th</sup>**
  - **Industry team to assist Catawba and ensure consistency with general industry positions**
- **Submitted TSTF-449 to the NRC on March 14<sup>th</sup>**
  - **Requested concurrent review**

# SG TS Improvements

- **Received RAIs and met with Staff to address comments.**
  - **Structural integrity performance criterion**
  - **Inspection interval**
  - **Tube inspection expectations**
- **Known remaining items are being resolved**

# SG TS Improvements

- **Submit response to RAIs, supplement the LAR and revise the TSTF in June**
- **Request NRC approval within 4 months**
- **Encourage PWRs to submit technical specification changes within 12 months after Staff approval**
- **Use of the CLIP**





# Summary

- **Proposed SG TS are a significant improvement**
- **Proposed TS provide the regulatory framework for proven, effective SG Program to assure tube integrity**
- **Proposed TS reflect years of NRC and industry effort**
- **Industry and NRC are close to agreement**
- **Industry is ready to implement the new TS**

The logo for the Nuclear Energy Institute (NEI), consisting of the letters 'NEI' in a bold, sans-serif font. A stylized, dark, curved shape is positioned below the 'E', resembling a nuclear fuel element or a similar component.



# **Steam Generator Tube Integrity Framework**

**Brian W. Sheron**

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**Office of Nuclear Reactor Regulation**

# **INTRODUCTION**

- **Degradation mechanisms**
- **Rulemaking: 1994 to 1996**
- **Proposed Generic Letter: 1997 to 1998**
- **NEI 97-06: 1998 to present**

# **ASSURANCE OF TUBE INTEGRITY**

- **Regulations (10 CFR Part 50, Technical Specifications)**
- **Industry programs (plant programs, industry guidance)**
- **NRC Review and Oversight**

# **CURRENT TS**

- **Do not reflect improvements for ensuring tube integrity**
- **Have some unnecessary prescriptive attributes**

# **ACCOMPLISHMENTS**

- **Improvements in industry guidance**
- **Improvements in NRC review and oversight activities**
- **Regulatory Framework**
  - **Catawba: February '03**
  - **Proposed generic TS: March '03**

# **MODIFICATIONS TO TS**

- **Objective - provide additional assurance that tube integrity will be maintained during operation**
  - **Structural integrity**
  - **Leakage integrity**

# **MODIFICATIONS TO TS (cont'd)**

- **Attributes**
  - **Largely performance based**
  - **Reflects performance of SGs with new materials**
  - **Flexible**
- **Public involvement**



# **CRITICAL ELEMENTS**

- **Assessment of potential degradation mechanisms**
- **Inspection**
- **Integrity assessment**
- **Maintenance, plugging, and repair**

## **CRITICAL ELEMENTS (cont'd)**

- **Leakage monitoring**
- **Secondary side integrity and foreign material exclusion**
- **Reports and self assessment**
- **Water chemistry**

# **ACCOMPLISHMENTS**

- **Defined process**
- **Content of TS**
- **Goals and critical elements of SG program**
- **Maximum inspection intervals**

# **ACCOMPLISHMENTS (cont'd)**

- **Leakage performance criteria**
- **Tube repair criteria and methods**
- **Condition monitoring requirements**

# **CLOSURE**

- **Efforts since receiving application (2/25/03)**
  - **Public meeting (3/27/03)**
  - **RAI issued (4/30/03)**
- **Resolve structural integrity performance criterion**

## **CLOSURE (cont'd)**

- **Resolve terminology/phraseology**
- **Clear up potential inconsistencies in proposal**
- **Approval of TS changes, completes NEI 97-06 review**

# **SCHEDULE**

- **Expect Duke Power response to RAI in June**
- **Catawba SER - 3 months after final RAI response**
- **Generic SER - 6 months after receipt of final submittal**

# **SUMMARY**

- **Current framework - reasonable assurance of tube integrity**
- **Near term schedule for improving regulatory framework**
- **NRC continues to work on technical issues as they arise**



# **ACRONYMS**

**CFR - Code of Federal Regulations**

**NEI - Nuclear Energy Institute**

**RAI - Request for Additional Info**

**SER - Safety Evaluation Report**

**SG - Steam Generator**

**TS - Technical Specifications**