



NUCLEAR ENERGY INSTITUTE

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U.S. Nuclear Regulatory Commission
Washington, DC 20555*

***SUBJECT: Steam Generator Degradation Specific Management Database,
Addendum 3***

PROJECT NUMBER: 689

References:

- 1. Letter From S. Magruder (NRC) to D. Modeen (NEI), "Request for Additional Information Regarding NP 7480-L, Addendum 1, 'Steam Generator Tubing Outside Diameter Stress Corrosion Cracking at Tube support Plates, Database for Alternate Repair Limits,' 1996 Database Update, November 1996," dated January 24, 1997***
- 2. Letter from D. Modeen (NEI) to S. Magruder (NRC), "Phase 1 Response to NRC RAI dated January 27, 1997," dated April 2, 1997***
- 3. Letter from T. Essig (NRC) to D. Modeen (NEI), "Proposed Data Exclusion Criteria and Adjustment of Measured Leak Rate for Tube R28C41 (Plant S)," dated February 26, 1998***
- 4. EPRI NP-7480-L, Addendum 2 and enclosures, dated June 5, 1998***

This letter transmits the Addendum 3 to the Steam Generator Degradation Specific Management Database. We are requesting NRC review and formal approval of the database and associated correlations for use by the industry in Alternate Repair Criteria (ARC) applications.

This Addendum 3 to EPRI report NP-7480-L updates and extends the database for outside diameter stress corrosion cracking at tube support plates previously reported in Addendum 2 of the report. Pulled tube data from one plant for 3/4 inch tubing and four plants for 7/8 inch tubing are added to the database, and the ARC correlations for burst pressure, probability of leakage and SLB leak rate are updated. The pulled tube

database is updated for the field no detectable defect (NDD) indications database and the voltage-dependent probability of detection (POPCD) is updated by adding results from seven additional inspection evaluations.

This addendum also provides two techniques for assigning bobbin voltages to indications detected by RPC (or equivalent probe) but not normally detectable in the reference bobbin coil frequency mix channel. One technique is based on identification of the flaw in the 200 kHz channel or alternate single frequency while the second technique is based upon development of a correlation between bobbin voltages and RPC voltages.

Also included in this report is an industry recommended program for tube pulls in support of the voltage based ARC. The industry tube pull program is a modification of the NRC GL 95-05 tube pull requirements.

The revised databases are used to update the ARC correlations for burst pressure, probability of leakage, and steam line break (SLB) leak rate as a function of bobbin coil voltage for both the 3/4-inch and 7/8-inch diameter tubing. We recommend that the Addendum 3 correlations be used for ARC applications.

We have provided below a clarification of Addenda Issues not requiring NRC approval:

- 1. Addendum 3 determination of bobbin voltages for indications detected only by RPC for dents less than five volts: This item is being implemented in ARC applications and approval is not required. Any NRC comments on this issue will be responded to or resolved in a subsequent Addendum.**
- 2. Addendum 2 voltage calibration procedures: This item is being implemented in ARC applications and approval is not required. Any NRC comments on this issue will be responded to or resolved in a subsequent Addendum.**
- 3. Addendum 2 accelerated growth rates for deplugged tubes: This item is being implemented in ARC applications and approval is not required. Any NRC comments on this issue will be responded to or resolved in a subsequent Addendum.**
- 4. Addenda correlation relating axial tearing to bobbin voltage: This correlation is only required for plants that have added modifications to lock TSPs and apply an increased voltage repair limit. Future**

applications of this correlation will be included in the appropriate ARC submittals for NRC approval and a generic NRC approval is not required. The correlation is updated in the addenda based on NRC guidance in the Byron/Braidwood SER for a three volt repair limit that data be added to enhance the correlation. NRC comments on the correlation methodology are welcome as possible guidance for future ARC submittals.

- 5. Non-conservative EOC predictions for small population of indications: These conditions tend to occur in the first cycle of an ARC application. The predictions are non-conservative in comparisons with very small numbers such as leak rates of a few tenths of a gpm or burst probabilities of 10^{-4} . These differences are negligible and do not warrant additional requirements.**
- 6. Inspection of intersections with low voltage dents: The industry opinion is that there is no need to re-evaluate the acceptability of the five-volt dent exclusion criteria included in GL 95-05.**
- 7. Application of ODSCC ARC with competing damaging modes: The industry feels that there is no need to develop additional guidance. Guidance exists in EPRI SG Examination Guidelines for active degradation.**

The following list prioritizes issues requiring NRC approval:

- 1. Approval of Addendum 3 database for ARC applications. NRC review and approval is requested by October 15, 1999 to permit use of Addendum 3 to support Fall outage ARC assessments.**
- 2. Addendum 3 industry tube pull program; the next required tube pull for the industry is February 2000. NRC review and approval is requested by January 2000.**
- 3. Addendum 2, with Addendum 3 update, voltage dependent POD. NRC review and approval is requested by January 31, 2000 to permit use in Spring 2000 ARC assessments.**
- 4. Addendum 2 voltage dependent growth rate methodology: A methodology is required to assess the GL 95-05 guidance that growth rates be evaluated for voltage dependence. NRC review and approval is**

requested by January 31, 2000 to permit use in spring 2000 ARC assessments.

- 5. Addendum 3 application of a bobbin to RPC voltage correlation for dents greater than five volts to determine bobbin voltages for indications detected only by RPC. NRC review and approval is requested by September 5, 2000 to permit use in Fall 2000 ARC assessments.**

As has been the past practice, we believe any NRC staff review of the enclosed reports is exempt from the fee recovery provision contained in 10 CFR Part 170. This submittal provides information that might be helpful to NRC staff when evaluating licensee submittals provided in response to Generic Letter 95-05. Such reviews are exempted under §170.21, Schedule of Facility Fees. Footnote 4 to the Special Projects provision of §170.21 states, "Fees will not be assessed for requests/reports submitted to the NRC...[a]s means of exchanging information between industry organizations and the NRC for the purpose of supporting generic regulatory improvements or efforts."

We would be pleased to meet with you or provide any support necessary to expedite acceptance and approval of the outstanding issues regarding the database. If you have any questions regarding the technical content of these enclosures, please contact Dr. Govinda Srikantiah of EPRI at (650) 855-2109.

Sincerely,



David J. Modeen

JHR/jms

Enclosure

- c: Mr. Ted Sullivan, U.S. Nuclear Regulatory Commission
Mr. Phil Rush, U.S. Nuclear Regulatory Commission
Mr. Jim Anderson, U.S. Nuclear Regulatory Commission
Mr. Stewart Magruder, Jr., U.S. Nuclear Regulatory Commission
Mr. David Goetcheus, TVA
Ms. Helen Cothron, TVA
Mr. Greg Kammerdeiner, Duquesne Light
Mr. Richard Pearson, NSP
Mr. Rick Mullins, Southern Co**

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Mr. Ron Baker, South Texas

Mr. Bob Exner, PG&E

Mr. John Arhar, PG&E

Mr. Steve Swilley, TU

Mr. John Jensen, AEP

Mr. Tim Olson, Wisconsin Public Service

Mr. Tom Pitterle, Westinghouse

Mr. Bob Keating, Westinghouse

Dr. Govinda Srikantiah, EPRI

Mr. David Steininger, EPRI

NEI Steam Generator Program Task Force

ELECTRIC POWER SOFTWARE CENTER

An EPRI Service Provided by SAIC

Certificate of Conformance

Date: November 1, 1999

Reference: Steam Generator Tubing Outside Diameter Stress Corrosion Cracking at
Tube Support Plates Database for Alternate Repair Limits

Product(s): 1999 Database Update, NP-7480L Addendum 3 (TR-113861)

Version: N/A

The above item(s) was procured in compliance with the QA requirements of the SAIC/EPSC QA Plan, Revision 3; Procedures QAP 7.1, Revision 1; and QAP 11.1, Revision 0; and are in compliance with 10CFR50, Appendix B and Part 21 requirements.

Certified by:



SAIC/EPSC Quality Assurance Manager

Date: Nov. 04 1999