

May 19, 2004

MEMORANDUM TO: Cathy Haney, Program Director
Policy and Rulemaking Program
Division of Regulatory Improvement Programs, NRR

FROM: Joseph L. Birmingham, Project Manager */RA/*
Policy and Rulemaking Program
Division of Regulatory Improvement Programs, NRR

SUBJECT: SUMMARY OF MAY 14, 2004 MEETING WITH NUCLEAR ENERGY
INSTITUTE (NEI) ON THE STATUS OF STEAM GENERATOR
STRUCTURAL INTEGRITY PERFORMANCE CRITERION

On May 14, 2004, Nuclear Regulatory Commission (NRC) staff met with representatives from NEI and industry at the NRC's office in Rockville, Maryland. The purpose of the meeting was for industry to present test results on burst pressure of steam generator tubes as a function of applied bending moment and to discuss the status of the structural integrity performance criterion (SIPC). Attachment 1 is a list of those persons attending the meeting. Attachment 2 provides, in Powerpoint format, the slides presented by industry at the meeting (ADAMS Accession Nos. ML041390339, ML041390345, ML041390353, and ML041390358).

After introductions, industry presented an overview of the planned presentation. The agenda included the steam generator tube burst test results, an independent assessment of the test results, and a status of the steam generator generic license change package (GLCP). The material for the presentation is described in detail in Attachment 2. A brief description of each section and the staff's reaction follows.

In its opening remarks, industry stated that it realized the importance of bringing this issue to closure. Industry stated that the information to be presented should answer most if not all of the staff's questions and enable the group to close this issue. The staff commented that the information from this meeting would be important in achieving "success" in reaching closure for the steam generator SIPC and the GLCP.

Regarding the steam generator tube burst test results, industry (1) described the program purpose; (2) provided a program description; (3) described the material samples preparation, the test parameters, the test equipment, and the test results; and (4) provided an analysis of the test result and industry's conclusions.

The test results provided an empirical basis for assessing tube burst strength as a function of applied bending moment. With use of appropriate scaling factors, this model is applicable to all tubing sizes and tubing alloys. Its interesting to note that this empirical model is independent of flaw size. The independent assessment of the test results concluded that there is a quantitative basis for evaluating the impact of bending moment on burst that avoids the need for a purely empirical approach. Both approaches indicate that the 3 times normal operating pressure

criterion against burst will usually be more limiting than the 1.2 criterion against burst or collapse under combined primary membrane plus bending during design basis accidents.

The staff stated that it would need to review the test and the test results more closely and that it looked forward to the receipt of the industry white paper which will contain additional details of the test and analysis results. The staff also observed that the industry data and analysis focused on partial-circumference through-wall circumferential cracks. The staff noted that a circumferential surface flaw extending around the entire circumference with the same limit load (moment) as the partial-circumference through-wall flaw would experience less rotation at the flaw and thus would receive a smaller moment reduction. Thus, the staff asked that the industry address in its forthcoming white paper the rationale by which its test data and analysis is conservatively bounding for surface cracks. Industry agreed to provide more detail on this aspect of the analysis.

Industry then discussed the resolution of GLCP issues regarding the SIPC and the lead plant submittal. For the SIPC, industry proposed resolutions for the addition of the term tube collapse in technical specifications (TS) and for the treatment of thermal loads. The staff and industry discussed the proposed resolutions and were generally in agreement. Industry presented the revised SIPC statement for the lead plant TS submittal and discussed it with the staff. After caucusing, the staff stated that the revised SIPC was acceptable but that the staff wanted additional detail on the test results and from an industry white paper in development. Industry agreed with this approach to provide additional detail on the test results and in the white paper.

Industry then presented the schedule for completion of the GLCP resolution actions. The schedule showed a target to finalize the impact study, the SIPC, and the technical basis white paper by October 2004. The staff agreed to work with industry to achieve the resolution of the actions and maintain the schedule.

The staff and industry discussed recent requests for additional information (RAIs) versus the information provided by the presentation and the test results analysis. The staff agreed that the presentation had provided much of the requested information and that the staff would review the RAIs to see if they could be withdrawn.

The group agreed that the meeting had achieved much to complete resolution of the GLCP issues and to share the burst test results with the staff. Having completed the agenda items, the group adjourned.

Project No. 689
Attachments: As stated
cc: Jim Riley, NEI

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ADAMS Accession No.: ML041540500

Document Name: G:\...\JBirmingham\Msum-new\MSUM NEI SG SIPC 05-14-04

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List of Attendees for 5/14/04 meeting on SG Integrity Issues

<u>Name</u>	<u>Organization</u>
Jim Riley	NEI
Forrest Hundley	Southern Co.
Darrell Costa	Areva
Mohammed Behravesh	EPRI
Greg Kammerdeiner	FENOC
Dan Mayes	Duke Energy
Russell Cipolla	APTECH Engineering
Ed Fuller	EPRI
Jim Begley	Framatome ANP
Kevin Sweeney	Arizona Public Service
David Ayres	Westinghouse
Bob Keating	Westinghouse
Gery Wilkowski	Engineering Mechanics Corp
Helen Cothron	Tennessee Valley Authority
Robert Cullen	Entergy
Emmet Murphy	NRC\NRR\EMCB
Louise Lund	NRC\NRR\EMCB
Bill Bateman	NRC\NRR\EMCB
Ken Karwoski	NRC\NRR\EMCB
Joe Birmingham	NRC\NRR\RPRP
Lane Hay	SERCH Bechtel
*Deann Raleigh	LIS\Scientech

* via telecon