June 8, 2006

Mr. Alex Marion
Executive Director of Engineering
Nuclear Generation Division
Nuclear Energy Institute
1776 I Street, NW Suite 400
Washington DC, 20006-3708

SUBJECT: STEAM GENERATOR TECHNICAL ISSUES

Dear Mr. Marion:

As you are aware, we have a meeting scheduled on July 12, 2006, to discuss various steam generator (SG) issues. Although the main purpose of the meeting is for the industry to provide the Nuclear Regulatory Commission (NRC) staff the status of several SG issues (e.g., the effects of non-pressure loads on SG tube leak rates), the NRC staff would like to take this opportunity to brief you on several topics/issues that we have identified during our routine interactions with licensees and vendors. Although our main goal during the July 12, 2006 meeting would be to familiarize the industry with these topics/issues, any insights that you have concerning them (including any planned activities to address them) would be beneficial.

The topics/issues are enclosed. Many of the topics/issues are presented as questions to illustrate some of the areas of interest.

If you have any questions, please contact Ken Karwoski of my staff at 301-415-2752.

Sincerely,

/RA/

John A. Grobe, Director
Division of Component Integrity
Office of Nuclear Reactor Regulation

Enclosure:
Steam Generator Topics

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Steam Generator Topics

1. Guidance on site qualification of techniques. The Electric Power Research Institute (EPRI) Steam Generator Examination Guidelines provide little detail on how to site validate techniques. In particular, it is not clear what is needed to conclude that a technique to be applied at a site is equivalent to a generically qualified Examination Technique Specification Sheet (ETSS) technique. For example, is it permissible to site validate a technique if the generically qualified technique is operated outside the range of essential variables specified in the generically qualified ETSS? What level of rigor is needed to demonstrate a technique is site validated? Are there any limits on when a generically qualified technique must be requalified? Is more detailed guidance being developed in this area?

2. Guidance for not exceeding accident induced leakage as a result of operating leakage. Some plants have normal operating leak rate limits (e.g., 150 gallons per day) which are identical to the amount of primary to secondary leakage assumed to be present during design basis accidents. However, the leakage experienced during normal operation may increase as a result of the increased loads during a design basis accident. In fact, depending on the nature of the flaw, the leak rate could increase substantially as a result of additional crack tearing or coalescing of cracks. Such phenomenon are difficult to predict. Is guidance being developed (or does it exist) on what the appropriate limit on normal operating leakage should be to ensure the accident induced leakage limit is not being exceeded?

3. Guidance on determining the limiting accident from a radiological standpoint (in terms of assessing compliance with the accident induced leakage performance criteria). There are several accidents that assume primary-to-secondary leakage exists (e.g., locked rotor, main steam line break). The amount of leakage assumed during each accident can vary. In addition, the loads (pressure and non-pressure loads) imposed on the tubes during these events can vary. What guidance exists on ensuring that licensees properly determine the most limiting accident (or alternatively that licensees are calculating the leakage associated with each design basis accident and comparing it to the appropriate accident induced leakage limit)?

4. Results of Foreign Object Task Force. Following several instances of tube degradation as a result of foreign objects (loose parts) in 2004 and 2005, it was the Nuclear Regulatory Commission (NRC) staff's understanding that a Foreign Object Task Force was chartered. The staff is interested in understanding the charter of this task force and its results. The staff is also under the impression that an EPRI report on predicting wear rates from steam generator loose parts was developed. We would be interested in understanding the recommendations of this report.

5. Divider plate cracking. Many plants limit the scope of steam generator tube inspections in the tubesheet region. It is the staff's understanding that some of these methodologies, if not all, rely on the divider plate to restrict tubesheet motion. Given the potential for the divider plate welds to crack, the staff is interested in understanding the various tubesheet-to-divider plate and divider plate-to-shell weld configurations (including weld materials) along with any inspection strategies that have been developed/implemented to monitor for cracking. In addition, the staff would like to understand whether the resistance the divider plate provides to the deflection of the tubesheet is necessary in order for the tubesheet stresses to be within the ASME Code, Section III stress limits.

ENCLOSURE

6. Industry method for measuring noise in the bobbin and rotating probe data. Discuss the methods currently being used to measure noise for data quality considerations (for detection and sizing of degradation).

7. Correlation of in-situ pressure test results and operational leakage. Discuss the extent to which the guidelines require licensees to confirm that the leakage observed during the in-situ pressure tests is consistent with the leakage observed during normal operation. Has the industry assessed the consistency between the normal operating leak rate and the leak rate observed during in-situ pressure tests to confirm that the in-situ pressure test is appropriately determining the leak rate (e.g., through appropriately simulating the loads on the tubes)?

8. Status of implementing the Indian Point 2 Lessons Learned Task Force recommendations. The staff is interested in understanding what specific changes were made to the industry guidelines to address the recommendations from the Indian Point Unit 2 tube rupture.

9. Time dependence of cracking (or flaw growth). Tests at Argonne National Laboratory and recent in-situ pressure test results at Surry Unit 1 indicate that flaws can continue to grow under stable pressure loading conditions. Discuss what efforts are underway to ensure that the in-situ pressure testing guidelines provide sufficient guidance to ensure that flaws are stable prior to concluding an in-situ pressure test.

10. Loads used to assess tube integrity. Discuss to what extent the industry guidelines specify that the loading conditions used in assessing tube integrity should be consistent with the NRC approved design and licensing basis (including the NRC approved thermal hydraulic analysis).

11. Use of control data to assess eddy current effectiveness. Analyst performance is critical at ensuring an effective inspection. One method for assessing analyst performance during the actual evaluation of the data is to insert control data (e.g., data known to be noisy or flawed) to ensure the analyst identifies this condition. Discuss to what extent the guidelines are being revised to incorporate such a requirement. This control data is sometimes referred to as a “Judas tube”. In addition, discuss to what extent guidance exists (or is being developed) for monitoring the consistency of the primary and secondary analyses and when there is a lack of consistency, whether the guidelines call for an investigation of the cause and possibly a tertiary analysis.