

As a result of its initial review of EPRI's October 2014 report, "Steam Generator Management Program: Investigations of Crack Initiation and Propagation in the Steam Generator Channel Head Assembly," the Nuclear Regulatory Commission staff requested the industry to address the following items during a meeting. The questions are in no particular order.

1. Some data were removed from the tube-to-tubesheet weld database because of the tungsten weld head positioning. Why were the data removed? What is the sensitivity of the results if these data were included?
2. What types of inspections are being referred to in Section 7.3? Are these inspections in accordance with the ASME Code or industry guidelines? Please discuss.
3. Summarize the inspection results for the Z-weld (tubesheet-to-shell weld)? Given the closeness of these inspections to the triple point, if something unexpected were to occur, would these inspections possibly give an opportunity to detect cracking were it to occur (e.g., detect leakage or boric acid residue during the performance of the inspection if a through wall flaw had occurred as a result of divider plate cracking)?
4. Previously, the stresses within the tubesheet were assessed for cracks in the divider plate. For some steam generators, we believe no credit was given for the presence of the divider plate during the original design. For other steam generators (primarily replacements), some credit may have been given for the divider plate in reducing stresses within the tubesheet. Please re-summarize the analyses performed and their results.
5. Please clarify the operating experience with Alloy 82 with respect to its susceptibility to cracking. The NRC staff is under the impression that welds which have exhibited cracking may have been fabricated using both Alloy 82 and Alloy 182, and hence it cannot be conclusively stated that cracks have not occurred in welds fabricated from Alloy 82.
6. Please clarify the difference between normal cladding and a structural butter (refer to page 2-3).
7. On page 2-19, there is reference to a mockup from another utility. Please discuss whether inclusion of this data would affect the conclusions of this report.
8. Intergranular stress corrosion cracking was reported on both the hot- and cold-leg sides of the channel head at Dampierre. Please clarify where this cracking occurred on the cold-leg (in the tubes, in the divider plate, etc.). Refer to page 3-22.
9. This report potentially applies to all steam generators. On page 4-3, it was indicated that the model 51 steam generator was considered the most limiting steam generator. Given the current fleet of steam generators in operation in the U.S., is this still the case?
10. Discuss the applicability of the information in this report to once-through steam generators (recognizing there is no divider plate in once through steam generators)?
11. Page 4-5 references a "Reference 0" report. What is the correct reference?

12. Page 5-17 (and page 5-1) implies that possible loose parts may result in steam generator channel head degradation (refer to Figure 5-26). Where was this degradation located (channel head cladding, divider plate, etc.)? Please discuss the applicability of this report to plants in which loose parts have impacted the tubesheet cladding or divider plate complex.
13. The first and second paragraph on page 5-24 are not clear on what is necessary for the stress corrosion cracking to occur. For example, can cracking occur in a divider plate with no cold-working? Is cold-working considered a "fabrication defect?"
14. As a result of this effort, does the industry plan to make any recommendations regarding material or design considerations for the design of new (including replacement) steam generators?
15. Some of the analyses performed in support of your assessments for divider plate cracking appear to assume 40 years of steam generator operation. Some units may operate their steam generators for a longer period of time, for example up to a maximum of 80 years of plant operation for subsequent license renewal. Please discuss which analyses were based on 40 years of operation and whether the conclusions would still be valid for steam generator operation for a longer period of time (e.g., up to 80 years or the maximum steam generator operating term for a plant license period of 80 years).
16. Because each plant has a unique set of design/licensing bases for their steam generators, did the analyses in this report address the limiting load levels from the entire range of design/licensing basis loadings for the population of plants that this report covers? For any design/licensing basis conditions that may have loads greater than those addressed in this report, please discuss how these greater loading levels would change the conclusions in this report, both for a fully degraded divider plate (through-wall flaw) and for one with less serious degradation.