

Enclosure 2

MFN 12-059, Revision 2

GEH Response to RAI 3.9-288 S01

Public Version

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NRC RAI 3.9-288 S01

In their response to RAI 3.9.288 (MFN 12-059, Revision 1, February 8, 2013), GEH provides a [[

]] The study shows that the hood region is adequately modeled for frequencies up to [[]], but the skirt region is accurate [[]]. GEH discusses, however, that no strong loads, like [[]], will exist in the ESBWR dryer, so that skirt models only need to be accurate [[]]. For the staff to confirm this assertion, GEH is asked to provide cumulative measured strain plots (alternating strain summed through frequency) for the Susquehanna and Grand Gulf dryers, and to show that the contribution to overall alternating stress for frequencies above [[]] is indeed very low.

GEH Response

Reference:

[1] MFN 12-043, Revision 2, Jerald Head (GEH) to the US Nuclear Regulatory Commission, “NRC Requests for Additional Information Related to the Audit of the Economic Simplified Boiling Water Reactor (ESBWR) Steam Dryer Design Methodology Supporting Chapter 3 of the ESBWR Design Control Document – Response for RAI 3.9-269, Supplement 1, August 9, 2013.

To illustrate the lack of significant loads in the skirt region above 210 Hz, the cumulative strains, pressures, and displacements were computed for on-dryer sensors from the power ascension testing of the Grand Gulf Nuclear Station (GGNS) and Susquehanna Steam Electric Station (SSES) replacement dryers, as well as two additional instrumented steam dryers.

Typical lower and upper strain gage and accelerometer power spectral density (PSD) plots along with the cumulative strain and displacement (shown in red) are plotted in Figures 1 through 3 for the GGNS replacement dryer measurements, a 251” boiling water reactor type 6 (BWR/6) plant. The cumulative curves demonstrate [[

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[[

Figure 1 – [[

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[[

Figure 2 – [[

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[[

Figure 3 – [[]]

Similar plots for SSES are provided as Figures 4 through 6. These plots show typical [[]] PSD curves along with the cumulative strain and displacement from the SSES on-dryer measurements. SSES is a 251" BWR/4 plant. [[

]] The cumulative strain and displacement curves in these plots show that [[]]

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Figure 4 – [[

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Figure 5 – [[

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Figure 6 – [[]]

Typical PSD plots of the GGNS and SSES on-dryer pressure transducers are provided in Figures 7 through 10. The cumulative pressure load curves show that [[

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Figure 7 – [[

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Figure 8 – [[

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Figure 9 – [[

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[[

Figure 10 – [[

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Typical PSD plots of on-dryer pressure transducers for a [[
]] are provided in Figures 11 and 12, respectively. The cumulative
pressure load curves, once again, show that [[

]]

[[

Figure 11 – [[

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[[

Figure 12 – [[

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]]

During the review of the GGNS measurements, it was observed that [[

]] as shown in Figure 13. This strain gage is located [[
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[[

Figure 13 – [[

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[[

]] Figures 7 and 8. [[

(Figures 14 and 15). [[

]] Figure 16, [[

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Figure 14 – [[

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Figure 15 – [[

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Figure 16 – [[

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Figure 17 – [[

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ESBWR Licensing Basis Changes

No change is proposed in regard to this response for the DCD or other licensing basis documents.