

## NRR-PMDAPEm Resource

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**From:** Diane Aitken (Generation - 6) [diane.aitken@dom.com]  
**Sent:** Tuesday, August 18, 2015 3:57 PM  
**To:** Sreenivas, V  
**Subject:** [External\_Sender] Information requested to support closeout of NAPS CAL Item #9  
**Attachments:** image001.gif

V,

Below is the information regarding CAL Item #9 that was discussed today during our 1:30 pm call. Please let me know if further information is need to close this CAL Item.

Thanks - Diane

### **CAL Item Number 9 - Time-Limiting Aging Analyses (TLAA) – Clarification in response to NRC Request of August 18, 2015:**

The components reviewed in detail for TLAA are identified in Attachment 2 of Dominion Letter Serial No. 13-143. Resulting moments at several locations (nodes) of the math models of each of these components from the results of dynamic analyses from the Mineral VA earthquake of August 23, 2011 were tabulated and compared to the previously calculated moments from North Anna's OBE. For the majority of locations, the ratio of moments between the August 23, 2011 event and the OBE was less than unity. At some locations, the ratio was larger than unity and these locations were reviewed in detail. These reviews can be described as follows:

- (a) At some locations, the previously calculated cumulative usage factor (CUF) was extremely small thus there was ample margin to accommodate the small increase in the seismic stress. An example is a 6" hot leg safety injection branch line where the ratio of the resulting moments was 1.22, but the previous CUF was only 0.03, thus the increase was considered acceptable.
- (b) At some locations, Westinghouse generic OBE loads were used in the previous analyses, which provided a significant margin. An example is the inlet nozzle of reactor coolant pump where the Westinghouse OBE moment was 20180 in-kip, compared to 7606 in-kip from the Mineral event of August 23, 2011. Another example is a 2" branch line CVCS Loop Fill connection to Cross-over leg, where the ratio of the moments was 1.56, however, the branch line was qualified using significantly higher seismic loads per WCAP-8914, Vol. 1&2, thus no fatigue concern existed at this location.
- (c) At some locations, the CUF was primarily governed by thermal transients at the gross discontinuity and not by the seismic loading. Therefore, marginal increases in seismic moment were considered acceptable. An example is the Low Head Safety Injection branch line where the ratio of the moments was 1.23; the CUF was 0.07, which was primarily due to thermal transients.

It should also be noted that the strong motion durations of the Mineral earthquake of August 23, 2011 ranged from 1 to 3 second in the three orientations, thus producing only a small number of alternating stress cycles. In summary, the August 23, 2011 earthquake had an insignificant effect on the component fatigue and previous TLAA's.

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**Sent Date:** 8/18/2015 3:56:48 PM  
**Received Date:** 8/18/2015 3:56:52 PM  
**From:** Diane Aitken (Generation - 6)

**Created By:** diane.aitken@dom.com

**Recipients:**  
"Sreenivas, V" <V.Sreenivas@nrc.gov>  
Tracking Status: None

**Post Office:** INBE10W803.mbu.ad.dominionnet.com

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