

From: Wanda D Craft
To: [Guzman, Richard](#)
Subject: [External_Sender] RE: Millstone Unit 3 - 30-day Special Report for RCS Pressure Transient (17-420)
Date: Monday, February 12, 2018 1:14:23 PM

Rich,

As we discussed, the technical reviewer is correct and the 28.3 psig should be added rather than subtracted in the calculation. The conclusion that the RCS pressure did not exceed the 10 CFR 50 Appendix G limit is not affected. We have entered this issue into our corrective action system and will update the special report to correct the information and also review/update our internal documents. If you have any questions, please let me know. Thanks.

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From: Guzman, Richard [mailto:Richard.Guzman@nrc.gov]
Sent: Friday, February 09, 2018 3:21 PM
To: Wanda D Craft (Generation - 6)
Subject: [External] RE: Millstone Unit 3 - 30-day Special Report for RCS Pressure Transient (17-420)

Wanda,

The information you provided was very helpful; the tech reviewer is looking to close out his review; however, he just had a wrap-up question to ensure his understanding of the calculation checks:

Should the calculation in the second paragraph be: $472.1 \text{ psig} + 28.3 \text{ psig} + 54.9 \text{ psig} = 555.3 < 625 \text{ psig}$? I.e., is the pressure lower or higher at the measurement location due to the dynamic pressure drop for one RCP running? Or, to be consistent with the calculation in the first paragraph, $625 - 28.3 - 54.9 = 541.8 \Rightarrow 541.8 \text{ psig} > 472.1 \text{ psig}$?

If it's easier to discuss with him, I'm happy to set up a brief clarification call.

Thanks,
Rich

From: Wanda D Craft [mailto:wanda.d.craft@dominionenergy.com]
Sent: Wednesday, February 07, 2018 3:43 PM
To: Guzman, Richard <Richard.Guzman@nrc.gov>
Subject: [External_Sender] RE: Millstone Unit 3 - 30-day Special Report for RCS Pressure Transient (17-420)

Rich,

Please see the information provided below for the response to the NRC Staff's clarification question

related to the MPS3 30-day Special Report:

The TS figure values of 435.5 psia and 481.5 psia are based on the 20% preservice hydro pressure limit (625 psi defined in 10CFR50 Appendix G) with pressure adjustments applied for the maximum control room main board instrument uncertainty of 115.5 psi and the maximum dynamic pressure differential between the reactor vessel and the wide range pressure transmitter. For one RCP running this differential pressure is 28.3 psi, for four RCPs running this differential pressure is 74.0 psi. Above 160°F up to four RCPs may be running. Therefore, the TS figure pressure value between 160°F – 185°F is determined as the 20% preservice hydro minus maximum main board uncertainty minus the dynamic pressure differential with four RCPs running: $625 \text{ psia} - 115.5 \text{ psi} - 74 \text{ psi} = 435.5 \text{ psia}$. This is the bounding condition (i.e. assuming all four RCPs are running and worst case main board pressure indication uncertainty).

In the Special Report and the ETE, Dominion Energy stated the *Technical Specification* pressure temperature limits **were** exceeded. Dominion Energy also concluded the *10 CFR 50 Appendix G and ASME Section XI Appendix G* limits **were not** exceeded. The ETE considers the actual number of pumps running at the time of the event (one RCP, not the maximum allowable of four RCPs) and the instrument uncertainty associated with the Plant Process Computer (PPC), not the control room main board instrument uncertainty. The PPC uncertainty is used because the transient data is obtained from the PPC, not from the main board. The PPC instrument uncertainty is 54.9 psi which is lower than the main board uncertainty of 115.5 psi used to develop the TS figure. Applying the PPC instrument uncertainty of 54.9 psi and the dynamic pressure drop between the pressure transducer and the RV with one RCP running of 28.3 psi to the peak transient pressure recorded on the PPC (472.1 psia) yields the peak transient RV pressure: $472.1 \text{ psia} - 28.3 \text{ psi} + 54.9 \text{ psi} = 498.7 \text{ psia}$.

Since 498.7 psia is less than the 10 CFR 50 Appendix G 20% preservice hydro limit of 625 psia, the 10 CFR 50 Appendix G limit was not exceeded.

It should be noted the TS figure limit and the 10CFR50 Appendix G and ASME Section XI Appendix G limits are related, but not the same. Exceeding the TS limit is not necessarily coincident with exceeding the 10 CFR 50 Appendix G and / or ASME Section XI Appendix G limits.

If you have additional questions, or would like to discuss this in a clarification call, please let me know. Thanks.

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From: Guzman, Richard [<mailto:Richard.Guzman@nrc.gov>]
Sent: Monday, February 05, 2018 7:35 PM
To: Wanda D Craft (Generation - 6)
Subject: [External] Millstone Unit 3 - 30-day Special Report for RCS Pressure Transient (17-420)

Wanda,

As we discussed today, the NRR technical staff has a clarification question after taking a look at the subject MPS2 report dated November 7, 2017, as well as the engineering technical evaluation ETE-MP-2017-1157 which was provided by the resident inspector. The reviewer noted that the P-T limits in TS 3/4.4.9 Figures 3.4.2 and 3.4.3 show a pressure limit of approximately 435 psig at 169°F, the temperature at which the transient occurred; in the engineering report, the licensee compares the maximum pressure during the transient of 472 psig to a pressure of 625 psia, which is 25% of the preservice hydrostatic test pressure; 10 CFR 50 Appendix G minimum temperature limits do not allow exceeding 20% of the preservice hydrostatic test pressure (625 psia for most PWRs) until the RCS temperature is equal to the highest reference temperature of the material in the closure flange region that is highly stressed by the bolt preload +120 degrees F, which for MPS3 is 176.3 degrees F (when adjusted for instrument uncertainty). The special report states that the highest pressure during the transient of 472 psia (498.7 psia when adjusted for instrument uncertainty) did not violate the 10 CFR 50 Appendix G limits (625 psia).

The NRR reviewer notes that the maximum allowable pressure below 176.3 °F shown on the TS figures is significantly less than 625 psia (435 psia on the figure between 160°F -185°F). From the minimum bolt-up temperature of 60°F out to 160°F, the maximum allowable pressure appears to be around 480 psia. The reviewer requests clarification on the licensee's comparison of the maximum allowable pressure during the transient (498.7 psia adjusted for instrument uncertainty) to the 625 psia limit. What are the other factors making the allowable pressure lower than 625 psia in the TS curves (e.g., RHR relief valve setpoint, instrument uncertainty?) Given that the pressure during the transient did exceed the pressure of 435 psig corresponding to a temperature of 169 degrees F on TS Figures 3.4-2 and 3.4-3, how does the licensee conclude the TS pressure-temperature limits were not exceeded?

If needed, we can set up a clarification call with the reviewer to get a common understanding and address the question.

Thanks,

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Rich Guzman  
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