From:	Guzman, Richard
Sent:	Tuesday, February 16, 2016 12:26 PM
To:	Michael L Whitlock (Generation - 6) (michael.l.whitlock@dom.com)
Cc:	'wanda.d.craft@dom.com'; 'Dana Knee (Generation - 6)'; Craig D Sly (Generation - 6) (craig.d.sly@dom.com)
Subject:	MPS2 LAR - Small Break Loss of Coolant Accident Re-analysis - REQUEST FOR ADDITIONAL INFORMATION (MF6700)

Michael,

The NRC staff has reviewed the information provided in the subject license amendment request dated September 1, 2015 (Agencywide Documents Access and Management System Accession No. ML15253A205), and has determined that additional information is needed to complete its review. Shown below are the NRC staff's request for additional information questions. The information was discussed with your staff on February 10, 2016. As agreed, please provide your formal response by March 28, 2016. If you have any questions, please contact me.

Thanks,

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Rich Guzman
Sr. Project Manager
NRR/DORL
US NRC
301-415-1030

REQUEST FOR ADDITIONAL INFORMATION

PROPOSED LICENSE AMENDMENT REQUEST

SMALL BREAK LOSS OF COOLANT ACCIDENT REANALYSIS

DOMINION NUCLEAR CONNECTICUT, INC.

MILLSTONE POWER STATION, UNIT 2

DOCKET NUMBER 50-336

CAC NO. MF6700

SRXB-RAI-1
Please identify what core operating limit report (COLR) parameters are governed by the methods described in EMF-2328(P)(A) and Supplement 1, and EMF-92-116(P)(A) and Supplement 1.
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SRXB-RAI-2
Core Nodalization: The number of nodes in the core presented in Figure 3-3,"S-RELAP5 SBLOCA Reactor Vessel Nodalization," of Attachment 3 of the license amendment request (LAR) appears to be inconsistent with that described in Supplement 1 to EMF-2328. Please confirm that the core nodalization is consistent with the updated methodology.

SRXB-RAI-3
Reactivity Feedback: As discussed in Supplement 1 to EMF-2328, when Technical Specifications (TSs) allow a positive moderator temperature coefficient (MTC) at full power, the maximum plausible value will be incorporated in order to allow an increase in power prior to reactor SCRAM. Per the recent Cycle 24 COLR, there appears to be a positive MTC when thermal power is >70%. Please confirm that the maximum plausible MTC value was incorporated into the analysis.

SRXB-RAI-4
For the most part, the system parameters and initial conditions in Table 3-1 of Attachment 3 of the LAR are unchanged from those provided in Table 14.6.5.2-3 in the Millstone Power Station, Unit 2 (MPS2) Final Safety Analysis Report (FSAR). Please discuss why the safety injection tank (SIT) Fluid Temperature, SG Secondary Pressure, and the AFW Temperature have changed in this analysis compared to those values in the Table 14.6.5.2-3 in the current FSAR. Additionally, please discuss why the uncertainty in the Radial Peaking Factor has increased compared to the uncertainty discussed in Chapter 14.6.5.2 in the FSAR.

SRXB-RAI-5
Figure 3-4, "Axial Power Distribution Comparison." Please identify the legend titles for the solid and dashed lines since the staff had difficulty reading them due to the clarity of the text. Additionally, has the axial power distribution changed from the distribution used for the analysis in the current FSAR?

SRXB-RAI-6
Auxiliary Feedwater (AFW) Flow: From comparison between Figure 4-13 (Steam Generator Auxiliary Feedwater Mass Flow Rates - 3.78-inch Break) of the LAR and Figure 14.6.5.2-13 of the current FSAR, it appears that there are significant modeling differences for the AFW flow. Please discuss the differences between the two modeling techniques and provide justification for the changes.

SRXB-RAI-7
As this is the first plant-specific application of this NRC-approved Small Break Loss of Coolant Accident (SBLOCA) method and for the staff to gain a better understanding of the SBLOCA phenomena for the transition break (3.79-inch diameter break) case, please provide the following six plots for the transition break that were provided for the limiting break (3.78-inch diameter break):

Figure 4-3: Primary and Secondary System Pressure
Figure 4-6: Loop Seal Void Fraction
Figure 4-9: Inner and Outer Core Collapsed Liquid Level
Figure 4-19: Integrated Break Flow and ECCS Flow
Figure 4-21: Hot Assembly Mixture Level
Figure 4-22: Peak Cladding Temperature at PCT Location

SRXB-RAI-8

As this is the first plant-specific application of this NRC-approved SBLOCA method and for the staff to gain a better understanding of the Reactor Coolant Pump (RCP) Trip Sensitivity Studies, please provide additional discussion of the following:

a. Describe the process that was used to determine the limiting break for these cold and hot leg break RCP trip sensitivity studies and please provide the breaks that were analyzed along with their associated peak cladding temperature (PCT) results.

b. Were the intact loop seals biased to promote the broken loop clearing, as was in the base break spectrum analysis? If the sensitivity studies did bias the intact loop seals, how was the transition break determined for the cold and hot leg break RCP trip sensitivity studies?

c. For the case assuming the relaxation in Appendix K assumptions, what cold and hot leg breaks were rerun to find out the maximum delay time for the operator action?

d. The results of the RCP trip sensitivity studies for the cold leg and hot leg breaks conclude that there is at least 2 minutes for the operators to trip the RCPs after the loss of subcooling margin in the cold leg pump suction and there would be additional time if there was some relaxation in the Appendix K requirements. Please elaborate on how the plant's Emergency Operating Procedures (EOPs) are supported by these conclusions.

SRXB-RAI-9
Please provide additional information regarding the evaluation of the Zirc-4 cladding:

a. Please identify which break sizes were rerun and provide their associated PCTs. Also, please provide the PCT vs. time plot for the limiting case.

b. Did the evaluation include the different RODEX2 input for Zirc-4 and were the correction factors applied for thermal conductivity degradation (TCD)?

c. The application states that the PCT penalty will be applied until Zirc-4 is no longer limiting. How will this transition be identified and controlled?

SRXB-RAI-10
Attachment 3 of the LAR does not include discussion regarding the implementation of Supplement 1 to EMF-92-116. Please confirm that the TCD correction factors were applied to the RODEX2 results for input into the SBLOCA analysis.

SRXB-RAI-11
The most recent MPS2 SBLOCA 50.46 PCT rackup sheet (ADAMS Accession Number: ML15188A346) contains a number of ECCS model assessments. Was this SBLOCA analysis completed with a version of S-RELAP5 that contains modeling updates that incorporated these assessments? Were any of the modeling updates different than the corrections described in their associated 50.46 reports?