

**From:** [Guzman, Richard](#)  
**To:** [Shayan.Sinha@dominionenergy.com](mailto:Shayan.Sinha@dominionenergy.com)  
**Cc:** [Danna, James](#)  
**Subject:** Millstone Power Station, Unit 3 - REQUEST FOR ADDITIONAL INFORMATION - Proposed LAR Addition of Analytical Methodology to the COLR for a LBLOCA (EPID: L-2020-LLR-0242)  
**Date:** Thursday, April 15, 2021 8:35:09 AM  
**Attachments:** [image003.png](#)

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Shayan,

On March 31, 2021, the U.S. Nuclear Regulatory Commission (NRC) staff sent Dominion Energy Nuclear Connecticut, Inc. (DENC, the licensee) the subject Request for Additional Information (RAI) as a draft e-mail. This RAI relates to the DENC's November 5, 2021, license amendment request proposing a revision to the Millstone Power Station, Unit No. 3 (MPS3) Technical Specifications (TSs). Specifically, the amendment would revise TS 6.9.1.6.b by adding WCAP-16996-P-A, Revision 1, "Realistic LOCA Evaluation Methodology Applied to the Full Spectrum of Break Sizes (Full Spectrum LOCA Methodology)," to the list of methodologies approved for reference in the Core Operating Limits Report for MPS3. The added reference identifies the analytical methods used to determine the core operating limits for the large break loss of coolant accident event described in the MPS3 Final Safety Analysis Report. The amendment also proposes to remove an obsolete COLR reference that is no longer used to support MPS3 core reload analysis.

On April 13, 2021, the NRC staff and DENC held a conference call to discuss clarifications on the draft RAI. Updated below is the official (final) RAI. As agreed on the call, please respond to this RAI by May 31, 2021, which is approximately 45 days from the date of this e-mail communication. A publicly available version of this message will be placed in the NRC's ADAMS system. Please contact me if you have any questions in regard to this request.



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**From:** Guzman, Richard  
**Sent:** Wednesday, March 31, 2021 8:54 AM  
**To:** [Shayan.Sinha@dominionenergy.com](mailto:Shayan.Sinha@dominionenergy.com)  
**Subject:** Millstone Power Station, Unit 3 - DRAFT Request for Additional Information - Proposed LAR, Addition of Analytical Methodology to the COLR for a LBLOCA (EPID: L-2020-LLR-0242)

Shayan,

By letter dated November 5, 2020 (ADAMS Accession No. ML20310A324), Dominion Energy Nuclear Connecticut, Inc., submitted the subject license amendment request for Millstone Power Station, Unit No. 3 (MPS3). The NRC staff has determined that additional information is needed to complete its review, as described in the request for additional information (RAI)

shown below. This RAI is identified as DRAFT at this time to confirm your understanding of the information needed by the NRC staff to complete its evaluation. If you'd like to have a clarification call, please let me know and I will coordinate availabilities w/the NRC technical staff. I intend to send out the questions below as official no later than April 14<sup>th</sup>, if possible.

Thanks,

**Richard Guzman**

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=====FINAL=====

**REQUEST FOR ADDITIONAL INFORMATION (RAI)**  
**REGARDING LICENSE AMENDMENT REQUEST**  
**ADDITION OF ANALYTICAL METHODOLOGY TO THE CORE OPERATING LIMITS**  
**REPORT FOR A LARGE BREAK LOSS OF COOLANT ACCIDENT**  
**MILLSTONE POWER STATION, UNIT NO. 3**  
**DOCKET NO. 50-423**  
**EPID: L-2020-LLA-0242**

**INTRODUCTION**

By letter dated November 5, 2020 (ADAMS Accession No. ML20310A324, Reference 1), Dominion Energy Nuclear Connecticut, Inc (DENC, the licensee) submitted a license amendment request (LAR) for Millstone Power Station Unit 3 (MPS3). The amendment would revise Technical Specification (TS) 6.9.1.6.b by adding WCAP-16996-P-A, Revision 1, "Realistic LOCA Evaluation Methodology Applied to the Full Spectrum of Break Sizes (Full Spectrum LOCA Methodology)," (Reference 2) to the list of methodologies approved for Reference in the Core Operating Limits Report (COLR) for MPS3.

The added reference identifies the analytical methods used to determine the core operating limits for the large break loss of coolant accident (LBLOCA) event described in the MPS3 Final Safety Analysis Report (FSAR), Section 15.6.5, "Loss-of-Coolant Accidents Resulting from a Spectrum of Postulated Piping Breaks within the Reactor Coolant Pressure Boundary." The amendment also proposes to remove an obsolete COLR reference that is no longer used to support MPS3 core reload analysis.

The NRC staff has determined that additional information is needed to complete its review, as described in the request for additional information (RAI) shown below.

**Regulatory Basis:**

The regulations in 10 CFR 50.46(b) require during LOCA events, the following criteria are met:

- (1) *Peak cladding temperature.* The calculated maximum fuel element cladding temperature shall not exceed 2200° F.
- (2) *Maximum cladding oxidation.* The calculated total oxidation of the cladding shall nowhere exceed 0.17 times the total cladding thickness before oxidation.
- (3) *Maximum hydrogen generation.* The calculated total amount of hydrogen generated from the chemical reaction of the cladding with water or steam

shall not exceed 0.01 times the hypothetical amount that would be generated if all of the metal in the cladding cylinders surrounding the fuel, excluding the cladding surrounding the plenum volume, were to react.

- (4) *Coolable geometry*. Calculated changes in core geometry shall be such that the core remains amenable to cooling.

## **RAI-1**

In Reference 1, Attachment 3, Limitation and Condition 2, under “Compliance” –

- (a) The licensee refers to LTR-NRC-18-30 (Reference 3) and LTR-NRC-19-6 (Reference 4) which describe changes to the Westinghouse small-break loss-of-coolant accident (LOCA) and LBLOCA emergency core cooling system (ECCS) evaluation models and the impact of these changes. These references provide generically estimated effect on the peak cladding temperature (PCT). In Reference 1, Attachment 3, Section 5.0, the FSLOCA Evaluation Model (EM) referred to is Revision 1, dated November 2016 which is not updated by incorporating the errors reported in References 3 and 4. Confirm that the MPS3 LBLOCA analysis was performed with the updated code after removing all errors reported in References 3 and 4. If the code was not updated, provide reasons, and justify quantitatively that the MPS3 LBLOCA analysis performed (without updating the code) has no impact on PCT, maximum local oxidation (MLO), core wide oxidation (CWO), and minimum containment back pressure.
- (b) References 3 and 4 do not report the error identified in Reference 5 that impacts the gamma energy redistribution multiplier. If applicable to MPS3, provide an evaluation of its impact on the MPS3 LBLOCA analysis PCT result and its thermal-hydraulic response. In case it is not applicable to MPS3, provide reasons.

## **RAI-2**

In Reference 1, Attachment 3, Section 3.0, the description of Region II analysis does not provide the LBLOCA break spectrum scenarios that were analyzed. Provide the break spectrum, i.e., the PCTs versus break areas and MLOs versus PCTs that were analyzed from which the limiting results reported in Table 5 were obtained.

## **RAI 3**

In Reference 1, Attachment 3, Section 4.0, under compliance with 10 CFR 50.46(b)(4), second paragraph, last sentence states, “Inboard grid deformation due to combined LOCA and seismic loads is not calculated to occur for Millstone Unit 3.” This statement does not explicitly state how this conclusion was determined. Provide the technical basis for this assertion.

## **REFERENCES**

1. Dominion Energy Nuclear Connecticut, Inc letter to NRC, , “Dominion Energy Nuclear Connecticut, Inc. Millstone Power Station Unit 3 Proposed License Amendment Request Addition of Analytical Methodology to the Core Operating Limits Report for a Large Break Loss of Coolant Accident (LBLOCA),” November 5, 2020, (ADAMS Accession No. ML20310A324).
2. Westinghouse Topical Report WCAP-16996-P-A, Revision 1, "Realistic LOCA Evaluation

Methodology Applied to the Full Spectrum of Break Sizes (FULL SPECTRUM LOCA Methodology)," November 2016.

3. Westinghouse Electric Company letter to NRC, LTR-NRC-18-30, "U.S. Nuclear Regulatory Commission 10 CFR 50.46 Annual Notification and Reporting for 2017," July 18, 2018 (ADAMS Accession No. ML19288A174).
4. Westinghouse Electric Company letter to NRC, LTR-NRC-19-6, "U.S. Nuclear Regulatory Commission 10 CFR 50.46 Annual Notification and Reporting for 2018," February 7, 2019 (ADAMS Accession Package No. ML19042A378).
5. Virginia Electric and Power Company letter to NRC, "Virginia Electric and Power Company North Anna Power Station Units 1 and 2 Proposed License Amendment Request Addition of Analytical Methodology to the Core Operating Limits Report for a Full Spectrum Loss of Coolant Accident (FSLOCA) Gamma Energy Redistribution Information," August 31, 2020, (ADAMS Accession No. ML20244A336).

=====FINAL=====