From: Guzman, Richard
Sent: Wednesday, January 13, 2016 6:31 PM
To: wanda.d.craft@dom.com
Subject: MPS2/MPS3 LAR for Removal of SLOD from the Offsite Power System - REQUEST FOR ADDITIONAL INFORMATION (MF6430, MF6431)

Wanda,

The NRC staff has reviewed the information provided in the subject license amendment request dated June 30, 2015 (Agencywide Documents Access and Management System Accession No. ML15183A022), and has determined that additional information is needed to complete its review. Shown below is the NRC staff's request for additional information questions. Please provide your formal response by February 29, 2016. If you have any questions, please contact me.

Thanks,
Rich

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US NRC
301-415-1030

REQUEST FOR ADDITIONAL INFORMATION REGARDING

LICENSE AMENDMENT REQUEST FOR REMOVAL OF SEVERE LINE OUTAGE

DETECTION

FROM THE OFFSITE POWER SYSTEM

MILLSTONE POWER STATION UNITS 2 AND 3

DOCKET NOS. 50-336 & 50-423

(TAC NOS. MF6430 AND MF6431)

By letter dated June 30, 2015 (Agencywide Documents Access and Management System Accession No. ML15183A022), Dominion Nuclear Connecticut, Inc. (the licensee) requested a license amendment request (LAR) for Millstone Power Station Units 2 and 3 (MPS2 and MPS3). The proposed amendments would revise the MPS2 and MPS3 Final Safety Analysis Reports (FSARs) to: 1) delete the information pertaining to the severe line outage detection (SLOD) special protection system, 2) update the description of the tower structures associated with the four offsite transmission lines feeding Millstone Power Station (MPS), and 3) describe how the current offsite power source configuration and design satisfies the requirements of General Design Criteria (GDC) 17, "Electric Power Systems" and GDC-5, "Sharing of Structures,

Systems, and Components." The U.S. Nuclear Regulatory Commission (NRC) staff is reviewing the submittal and has determined that the additional information as requested below are needed to complete its review.

1). On page 18 of 42 of Attachment 1 of the LAR, the licensee states:

"Within the approximate 9-mile ROW [right of way] for the 345 kV transmission lines leaving the MPS switchyard, there are several points where a single transmission tower is in close enough proximity to affect adjacent towers in the event a tower was to fall. In addition, at Hunts Brook Junction, the Line 371/364 path is crossed over by Lines 383 and 310. The failure of one 345 kV line causing the failure of another 345 kV line is not considered a normal contingency by ISO-New England, but the lines are in close enough proximity such that the failure of one line could impact another line. The above scenarios are not normal contingencies for ISO-New England and single failure is not required to be applied to the transmission system."

a). Based on the above, if two lines are impacted by a single point vulnerability while another line is out of service, then the remaining line may trip due to its relays experience large swings in power and voltage as a result of instability which will result in loss of offsite power (LOOP) to MPS. Explain how the LOOP can be avoided to MPS in this scenario which is similar to the MPS LOOP experience on May 25, 2014? What automatic actions will be required to maintain the grid stability without SLOD special protection system (SPS)?

b). How is independence and reliability achieved if one 345 kV line (single circuit tower (SCT)) failure impacts another 345 kV line SCT? Please explain how GDC 17 is satisfied in this situation with respect to minimizing the probability of losing electric power from any of the remaining power supplies.

c). Please explain why the FSAR markup did not address the grid stability where failure of one SCT impacts another SCT while one SCT (simultaneous ground fault) is in outage with only one transmission line available?

2). a.) On page 19 of 42 of Attachment 1 of the LAR, the licensee states that "Even with one 345 kV line out of service and a single failure affecting one additional transmission element (line, breaker, generator, etc.), the ISO-New England Millstone facility Out Guide shows the offsite system will remain stable."

Please provide a summary of the "ISO-New England Millstone Facility Out Guide-Text Document" Revision 1, dated February 26, 2015, including all assumptions used that shows the offsite system will remain stable. Also, provide details of applicable North American Electric Reliability Corporation (NERC) Standards that ISO-New England used to satisfy the grid stability including MPS voltage and frequency requirements.

b). On page 23 of 42 of Attachment 1 of the LAR, the licensee states that "ISO-New England has performed stability studies which conclude that when two 345 kV lines are in service, the transmission system will remain stable assuming the additional loss of a third 345 kV line (leaving only one 345 kV line connected to the Millstone switchyard) as long as Millstone Station electrical output is less than the value provided in Millstone Facility Out Guide-Text Document."

Please provide a summary of the MPS output limitations specified in this document including all contingencies postulated (Table 1). Explain how the MPS output will be automatically controlled to prevent a LOOP or system instability without a SLOD SPS

3). a). On page 9 of 42 of Attachment 1 of the LAR, the licensee states that "although SLOD was designed as a NPCC Type 1 special protection system, over the time the transmission system had evolved with new contingencies that SLOD would not detect."

Please identify the contingencies that SLOD would not have detected and also the relays that are in place now to address all NPCC and ISO-New England stability and reliability criteria.

b). On page 11 of 42 of Attachment 1 of the LAR, the licensee states that "With the four transmission lines separated onto SCTs, Northeast Utilities considered leaving SLOD in service as an additional defense-in-depth measure. However, since SLOD created an unnecessary risk of misoperation and transmission operator burdens, Northeast Utilities decided to remove SLOD from service. Dominion agreed with this decision since it would eliminate a potential misoperation of SLOD that could inadvertently trip MPS3. Therefore, SLOD was removed to eliminate a special protection scheme, thereby improving station service grid reliability and operational safety."

What are the potential risks of SLOD misoperation and transmission operator burdens that resulted in making a decision to remove the SLOD for improving grid reliability and operational safety? Also, discuss any operating experience during the period SLOD was in operation that caused grid instability, Millstone multi-unit trips, and LOOP events.

4). Since manual actions cannot prevent system instability or LOOP, in the absence of SLOD SPS, please explain the automatic actions that will take place to curtail generation to less than 1650 megawatts within 60 seconds if station generation exceeds this limit such as MPS2 and MPS3 operating at full power when contingencies exist as listed in Northeast Utilities letter dated August 1, 1983, shown in Attachment 7? Also, please clarify how the status of the availability of two remote components – the Montville 345 kV tie-breaker and the Montville-Haddam Neck line – without SLOD will be transmitted to Millstone?

5). On page 22 and 23 of 42 of Attachment 1 of the LAR, the licensee states:

"The stability/transient studies conclude that with one 345 kV transmission line out of service, the loss of either MPS2, MPS3, the largest other unit on the grid, or the most critical transmission line, the grid will remain stable and offsite power will be available to MPS. Therefore, ISO-New England does not require MPS to reduce power output in order to maintain offsite power stability when only one of the four 345 kV transmission lines is out of service." "DNC takes a more conservative approach in addressing these limiting areas of concern that could potentially cause the loss of two 345 kV lines due to a single failure. DNC conservatively considers that when less than four 345 kV transmission lines are in service, a degradation of safety margin and defense-in-depth has occurred."

From the above statements, it is not clear to the staff whether DNC's conservative approach includes additional transmission line out of service (loss of two 345 kV lines due to a single failure) and how it is addressed in the transient/stability studies. Please

provide a brief summary with applicable excerpts, and conclusions including all assumptions used in the studies.

6). The licensee states in Attachment 1 of the LAR that it is proposing to establish appropriate requirements in the Technical Requirements Manual (TRM) that are applicable whenever MPS output exceeds 1650 megawatts electrical net and any one of the four 345 kV transmission lines is out-of-service (i.e., nonfunctional). With one offsite line nonfunctional, the TRM requirements would allow 72 hours to restore the nonfunctional line with a provision to allow up to 14 days if specific TRM action requirements are met. It further states that the licensee meets the staff positions described in Branch Technical Position 8-8, "Onsite (Emergency Diesel Generators) and Offsite Power Sources Allowed Outage Time Extensions," Revision 0, dated February 2012.

Please clarify whether a supplemental power source is provided as a backup to the inoperable offsite power source, to maintain the defense-in-depth design philosophy of the electrical system to meet its intended safety function.

7). Under “Element 1 - Traditional Engineering Analysis,” of Attachment 1 of the LAR (page 21 of 42), it states that:

> “The MPS offsite transmission lines are designed and operated in accordance with the ISO-New England Planning Procedure No. 3, "Reliability Standards for the New England Area Bulk Power Supply System" (Reference 7.9) and NPCC's Regional Reliability Reference Directory #1, "Design and Operation of the Bulk Power System" (Reference 7.4). The purpose of these New England reliability standards is to ensure the reliability and efficiency of the New England bulk power system. North American Electric Reliability Corporation (NERC) Reliability Standard NUC-001-2.1, "Nuclear Plant Interface Coordination" (Reference 7.10) requires each nuclear plant generator operator and its associated transmission entities to establish nuclear interface agreements that document the applicable Nuclear Plant Interface Requirements (NPIRs) for the purpose of ensuring nuclear plant safe operation and shutdown.”

Please identify all critical transmission elements in the area of the Millstone Station together with the generation output of the Millstone complex and any nearby generation greater than the Millstone Station. Explain clearly the contingencies required to be postulated in system studies in accordance with NERC reliability standards including N-1 contingencies.