## NRR-DRMAPEm Resource

**From:** Miller, Ed
**Sent:** Monday, June 17, 2019 2:46 PM
**To:** craig.d.sly@dominionenergy.com
**Cc:** diane.aitken@dominionenergy.com
**Subject:** Request for Additional Information Re: EAL Scheme Change
**Attachments:** Dominion EAL Scheme Change RAI.docx

Mr. Craig Sly
Manager, Nuclear Fleet Licensing
Virginia Electric Power Company

Dear Mr. Sly,
By letter dated January 4, 2019 (Agencywide Documents Access and Management System (ADAMS) Accession Number ML19011A237), Dominion Energy Nuclear Connecticut, Inc. and Virginia Electric and Power Company requested U.S. Nuclear Regulatory Commission (NRC) approval for an emergency action level scheme change for Millstone Power Station - Units 1, 2, and 3, North Anna Power Station - Units 1 and 2, and Surry Power Station - Units 1 and 2.

The NRC staff has reviewed the submittal and determined that additional information is needed to complete our review, as indicated in the request for additional information (RAIs) attached to this e-mail. A clarification call was held with your staff on June 13, 2019, to discuss a draft version of these RAIs (ADAMS Accession No. ML19162A005). The purpose of the call was to ensure that the questions were clear, that the regulatory basis for the questions was understood, and that the information wasn't already on your docket. Based on the discussion, a modification was made to RAI 2, to clarify that it was in reference to gaseous radiation monitors. The other questions remain unchanged. At conclusion of the call, a response date of July 30, 2019, was agreed to by your staff. If a situation arises where the response date would need to be postponed, please let me know to discuss schedule impacts.

If you have any further questions, please contact me at (301) 415-2481.

Ed Miller
Project Manager
Special Projects and Process Branch
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Office of Nuclear Reactor Regulation
US Nuclear Regulatory Commission

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EMERGENCY ACTION LEVEL SCHEME CHANGE

MILLSTONE POWER STATION, UNITS 1, 2, AND 3

NORTH ANNA POWER STATION, UNITS 1 AND 2

SURRY POWER STATION, UNITS 1 AND 2

DOCKET NUMBERS 50-245, 50-336, 50-423, 72-47, 50-338, 50-339,

72-16, 72-56, 50-280, 50-281, 72-2, AND 72-55

By letter dated January 4, 2019 (Agencywide Documents Access and Management System (ADAMS) Accession Number ML19011A237 [package]), Dominion Energy Nuclear Connecticut, Inc. and Virginia Electric and Power Company (hereafter collectively referred to as Dominion) requested U.S. Nuclear Regulatory Commission (NRC) approval for an emergency action level (EAL) scheme change for Millstone Power Station (MPS) - Units 1, 2, and 3, North Anna Power Station (NAPS) - Units 1 and 2, and Surry Power Station (SPS) - Units 1 and 2. The NRC staff has reviewed the submittal and determined that additional information is needed to complete our review, as indicated in the requests for additional information (RAIs) below.

Regulatory Requirements/Background

The requirements of Section 50.47(b)(4) to Title 10 of the Code of Federal Regulations (10 CFR) state, in part, that:

A standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee...

The most recent industry EAL scheme development guidance is provided in the Nuclear Energy Institute (NEI) document NEI 99-01, “Development of Emergency Action Levels for Non-Passive Reactors” (ADAMS Accession Number ML12326A805). By letter dated March 28, 2013, the NRC endorsed NEI 99-01, Revision 6, as acceptable generic (i.e., non-plant-specific) EAL scheme development guidance. Dominion proposed to revise its current EAL schemes for MPS, NAPS and SPS to one based on NEI 99-01, Revision 6.

**RAI 1 (MPS Units 2 & 3, NAPS Units 1 & 2, and SPS Units 1 & 2)**

The proposed Table R 1, “Unit [1, 2, or 3 as applicable] Gaseous Effluent Monitor Classification Thresholds,” that is used for EALs RU1, RA1, RS1, and RG1 Notification of Unusual Event (NOUE) thresholds, are based on a dose that considers only a fraction of the U.S. Environmental Protection Agency Early Phase Protective Action Guides rather than a low level radiological release that exceeds regulatory commitments for an extended period (e.g., an uncontrolled release).

Please explain what features, that are unique to Dominion facilities, require a deviation from the NRC-endorsed EAL scheme or provide threshold values that are consistent with NEI 99 01, Revision 6, such that an NOUE would be declared for a low level radiological release that exceeds regulatory commitments for an extended period (e.g., an uncontrolled release).

**RAI 2 (NAPS Units 1 & 2 and SPS Units 1 &2)**

A review of Calculation RP-18-08 shows that NAPS and SPS each have one gaseous radiation monitor that has Offsite Dose Calculation Manual (ODCM) based setpoints that are not consistent with other Dominion gaseous radiation monitor setpoints or other Dominion gaseous radiation monitor setpoints that were provided as threshold values. The outlying monitors have ODCM based setpoints that would be greater than the proposed Alert threshold values, which are approximately an order of magnitude higher that the current threshold values. These limits should roughly correspond to 500 mrem/year (approximately .06 mrem per hour). As such, it appears that the alarm setpoints for these effluent flow paths are above both the technical specification and Alert threshold values. Therefore, the NRC staff could not determine how the setpoint that corresponds to greater than 10 mrem per hour was obtained.

a. Please verify that those gaseous radiation monitors (NAPS GW RM-178 and SPS GW RM 130), which would result in NOUE setpoints that are greater than the Alert threshold value, were correctly calculated as directed by the site specific ODCM, and revise setpoints if justified.

a. If Dominion determines that gaseous radiation monitor setpoints for NAPS GW RM-178 and SPS GW RM 130 were correctly calculated, please provide threshold values that would alert the operators of excessive effluent levels that are approximately an order of magnitude less than the threshold values for an Alert classification level.

**RAI 3 (MPS Units 2 & 3, NAPS Units 1 & 2, and SPS Units 1 & 2)**

The proposed Table R 1, “Unit [1, 2, or 3 as applicable] Gaseous Effluent Monitor Classification Thresholds,” that is used for EALs RA1, RS1, and RG1 have threshold values based on main steam line radiation monitors. Dominion does not propose main steam line radiation monitor threshold values for EAL RU1 because there are no ODCM limits on the main steam and/or the auxiliary feedwater exhausts and the limited ability for the respective radiation monitors to detect low level radioactivity. The steam line monitors are typically installed to provide information relative to steam generator tube leakage while operating at power. This information includes which steam generator, if any, is the most affected and a relative quantity of steam generator tube leakage. In using threshold values for EALs RA1, RS1, and RG1 based on main steam line monitor radiation readings, the licensee must make assumptions about both the flow rate and the isotopic mix at the time of the accident. These assumptions could adversely impact the accuracy of the threshold value.

Please explain how the main steam radiation monitors can provide an accurate offsite dose indication by using an assumed steam flow, that could change by several orders of magnitude post-accident, concurrent with detectors that may not accurately assess the post accident isotopic mix or consider removing the steam generator discharge radiation monitors from the proposed Dominion EAL Schemes.

**RAI 4 (MPS Units 2 & 3, NAPS Units 1 & 2, and SPS Units 1 & 2)**

The proposed Table R 1, “Unit [1, 2, or 3 as applicable] Gaseous Effluent Monitor Classification Thresholds,” that is used for EALs RA1, RS1, and RG1 have threshold values that have substantially changed from the current threshold values. Enclosure 7, “Summary of Calculations,” of the letter dated January 4, 2019, provides that the Meteorological Information and Dose Assessment System (MIDAS) was used to determine the projected threshold values.

However, it was not clear if the methodology used in determining the proposed threshold values is the same methodology currently being used for dose assessment. As such, the basis for the change in the threshold values for EALs RA1, RS1, and RG1 were not apparent to the NRC staff.

Please provide an explanation that supports the changes to the threshold values in the for EALs RA1, RS1, and RG1 from their existing EAL values to the proposed EAL values. This explanation should address the fact that MIDAS was used to determine the proposed EAL threshold values and appears to be the same program that is currently used for dose assessment.

**RAI 5 (MPS Units 2 & 3, NAPS Units 1 & 2, and SPS Units 1 & 2)**

The proposed threshold values for EAL RU1 do not include the below effluent instruments that are identified in the respective unit's offsite dose calculation manuals.

- MPS Unit 2: Waste Gas Decay Tank Monitor (RM9095), Reactor Building Closed Cooling Water (RM6038);
- MPS Unit 3: Engineering Safeguards Building Monitor (HVQ RE49);
- NAPS: Liquid Radwaste Effluent Line (1-LW-RM-111), Steam Generator High Capacity Blowdown Line (1(2) SW RM 130(230)), Condenser Air Ejector (1(2) SV RM 121(221)); and
- SPS: Service Water Effluent Line (1 SW RM 107 A, B, C, and D), Radwaste Facility Effluent Line (RE-RRM-131), Condenser Air Ejector (1(2) SV RM 121(221)), Ventilation Vent No. 1 (1-VG-RM-104), Radwaste Facility Vent (RRM-101).

Please revise the proposed EAL RU1 threshold values to include the above effluent instruments or provide justification that supports excluding those instruments from the proposed EAL scheme. For example, some effluent flow path instrumentation may be retired in place.

**RAI 6 (MPS Units 2 & 3, NAPS Units 1 & 2, and SPS Units 1 & 2)**

The threshold value for EAL CA3.1 includes a note that indicates the EAL is not applicable if heat removal is in operation and reactor coolant system (RCS) temperature is being reduced within the applicable heat up duration. This is not appropriate when the RCS is not intact or in reduced inventory.

Please explain how the Emergency Director would not potentially apply the note indicating that EAL CA3.1 is not applicable if a RCS heat removal system is in operation and reducing RCS temperature to high temperature conditions, when the RCS is not intact or in reduced inventory.

**RAI 7 (MPS Units 2 & 3, NAPS Units 1 & 2, and SPS Units 1 & 2)**

The threshold value for EAL CA3.1 does not include a note indicating that the threshold value for an increase in RCS pressure does not apply when the RCS is in water solid conditions.

Please explain how EAL CA3.1 will be assessed in a timely and accurate manner during solid water conditions or consider adding a clarifying note to the threshold value for EAL CA3.1.

**RAI 8 (MPS Unit 2)**

The proposed Fuel Clad and RCS Potential Loss B.3 threshold values state, “Applicable RCS and Core Heat Removal (HR) Safety Function Status Check acceptance criteria not met.” Since the proposed Basis for Fuel Clad Potential Loss B.3 includes HR-3 – Once Through Core Cooling (OTCC), this threshold value would not be met until it was determined that OTCC is not effective. This is not consistent with the NEI 99 01, Revision 6, guidance which states, “[t]his condition indicates an extreme challenge to the ability to remove RCS heat using the steam generators (i.e., loss of an effective secondary side heat sink).”

Please explain how the Emergency Director would make an accurate assessment of Fuel Clad and RCS Potential Loss B.3 based on a loss of the ability to remove heat using the steam generators rather than based on an inability to implement OTCC.

**RAI 9 (MPS Unit 2)**

Table 4, “MPS2 Comparison Matrix,” provides that “MPS2 does not start a standby charging pump if inventory cannot be maintained with operating makeup, rather SI [safety injection] would be initiated.” Considering that Combustion Engineering plants typically have a pressurizer level control system that would automatically start a second charging pump on lowering level, and abnormal operating procedures (AOP) for a RCS leak would direct starting a second charging pump and would not typically initiate safety injection without tripping the reactor, the NRC staff could not understand why the alternate threshold wording was required. Additionally, it appears that operators would have to subtract reactor coolant pump leakage and letdown from 50 gallons per minute. This appears to require the operators to make a calculation, that could involve potentially changing values, to assess this RCS Potential Loss A.1.

If it is not reasonable that a second charging would either start automatically on lowering pressurizer level or as an abnormal operating procedure response to a RCS leak, then provide a readily available threshold value for RCS Potential Loss A.1 that does not involve a mass balance calculation. If a RCS leakage AOP directs that the reactor be tripped or otherwise rapidly shut down based on RCS leakage, it may be reasonable to use those conditions as a threshold value.

**RAI 10 (NAPS Units 1 & 2, and SPS Units 1 & 2)**

Table 4, “NAPS (SPS) Comparison Matrix,” provides that “Starting of a standby charging pump is not representative of RCS leak size relative to charging pump capacity.” Although the charging systems for a Westinghouse plant are not all identical, either system design or operator actions will typically maximize charging flow in response to lowering pressurizer level. The threshold value for RCS Potential Loss A.1 is based on the capability of one charging pump to maintain pressurizer level after either the automatic system response or operator actions have maximized charging flow and not on a specific RCS leak rate. The developer notes for RCS Potential Loss A.1 allow for an appropriate site specific value. However, the threshold value provided is based on nominal charging pump capacity, and the basis discussion indicates that normal reductions in RCS inventory, such as letdown and RCP seal leakoff, should be excluded. This appears to require the operators to make a calculation, which could involve changing values, to assess this RCS Potential Loss A.1.

If it is not reasonable that a second charging would either start automatically on lowering pressurizer level or as operator response to a RCS leak, then provide a readily available

threshold value for RCS Potential Loss A.1 that does not involve a mass balance calculation. Note: if a RCS leakage AOP or alarm response manual directs that the reactor be tripped or otherwise rapidly shut down based on RCS leakage, it may be reasonable to use those conditions as a threshold value.

**RAI 11 (MPS Unit 2, and SPS Units 1 & 2)**

The proposed threshold value for MPS 2 EAL HU 2.1 requires notification by MPS Unit 3 during a seismic event. Depending on the potential impacts, MPS Unit 3 may not be readily available to contact MPS Unit 2.

The proposed threshold value for SPS Units 1 and 2 is modified by a note, which indicates that EAL HU 2.1 should be declared once the event has not been diagnosed within 15 minutes provided control room personnel felt a seismic event.

Please explain why the alternative guidance in the NEI 99 1, Revision 6, developer notes was not included as an alternate threshold value since this would provide clear and consistent guidance for declaring EAL HU2.1 if the primary method was either not available or delayed.

**RAI 12 (NAPS Units 1 & 2, and SPS Units 1 & 2)**

The NAPS (SPS) Fire Areas for EALs HU 4.1 and HU 4.2 in the proposed Table H 1 includes the entire turbine, auxiliary, fuel, and decontamination buildings. The threshold values for EALs HU 4.1 and HU 4.2 should represent fires that could potentially degrade the level of safety of the plant. It appears that the proposed Table H-1 could result in an NOUE declaration for fires that do not potentially degrade the level of safety of the plant.

Please review the NAPS (SPS) Fire Areas for EALs HU 4.1 and HU 4.2 in the proposed Table H1 and verify that a fire that cannot be extinguished within 15 minutes anywhere in the turbine, auxiliary, fuel handling, or decontamination buildings would potentially degrade the level of safety of the plant.

**RAI 13 (MPS Units 2 & 3, NAPS Units 1 & 2, and SPS Units 1 & 2)**

Dominion proposes to deviate from a standard EAL scheme by eliminating the site specific restoration time from the threshold value for EAL MG 1.1. The NRC staff does agree that, as stated in the basis discussion for EALs MS 1.1 and MG 1.1, which states “credit can be taken for any [alternating current] AC power source that has sufficient capability to operate equipment necessary maintain a safe shutdown condition, such as the FLEX generators.” The NRC staff also does not agree that the existence of FLEX equipment and appropriate procedures to use that equipment provides justifies the removal of the “site specific” time to restore AC power. Additionally, the basis discussion that credit can be taken for any AC power source is not reflected in the threshold values for EALs MS 1.1 and MG 1.1, nor is it consistent with Emergency Preparedness Frequently Asked Question (EPFAQ) 2015-015, “Consideration of listing site specific power sources applicable for consideration for loss of power EALs.”

a. Please explain what features, which are unique to Dominion facilities, require a deviation from the NRC-endorsed EAL scheme or provide threshold values that are consistent with NEI 99 01, Revision 6, such that a General Emergency classification level would be declared for an extended loss of AC power with sufficient capacity to operate equipment necessary to maintain a safe shutdown condition.

b. To ensure timely and accurate assessment of MS 1.1 and MG 1.1, please include either a condition or a note for EALs MS 1.1 and MG 1.1 threshold values that clearly indicates that “credit can be taken for any AC power source that has sufficient capability to operate equipment necessary maintain a safe shutdown condition, such as the FLEX generators.”

**RAI 14 (NAPS Units 1 & 2, and SPS Units 1 & 2)**

The proposed threshold value for EALs NAPS MU 4.1 and SPS MU 4.1 appear to use radiation monitor readings that are based on an accident mix after 1 hour of decay, which appeasr to reflect post shut down conditions. Although the associated Technical Specification is applicable in Mode 1, no full power threshold value was provided.

Please explain how EALs NAPS MU 4.1 and SPS MU 4.1 will be accurately assessed in a timely manner while operating at full power or revise accordingly.

**RAI 15 (MPS Units 2 & 3, NAPS Units 1 & 2, and SPS Units 1 & 2)**

The proposed threshold value for EALs MPS MU 4.1, NAPS MU 4.2, and SPS MU 4.2 appears to use post shutdown radiation levels that would be consistent with an iodine spike at full power that corresponds to the Technical Specification limit. Although the associated Technical Specification is applicable in Mode 1, no full power threshold value was provided for the applicable EALs.

Please explain how EALs MPS MU 4.1, NAPS MU 4.2, and SPS MU 4.2 will be accurately assessed in a timely manner while operating at full power.

**RAI 16 (SPS Units 1 & 2)**

The proposed threshold value for EAL SPS MU 4.2 appears to be for conditions when the Technical Specifications would no longer apply. Specifically, it appears EAL SPS MU 4.2 would no longer be applicable when the reactor is shut down and RCS temperature is reduced to less than 500°F.

Please explain how EAL SPS MU 4.2 will accurately assessed, such that an NOUE classification level would only be declared when the associated Technical Specification is applicable.

**RAI 17 (MPS Units 2 & 3, NAPS Units 1 & 2, and SPS Units 1 & 2)**

The proposed threshold value for EALs MPS MU 4.2, NAPS MU 4.3, and SPS MU 4.3 appear to apply to conditions where the Technical Specifications allow continued operation for 48 hours while the licensee makes attempts to restore either I 131 or Xe 133 concentrations to within the Technical Specification limits. However, it may not be appropriate to declare an NOUE classification level when the Technical Specification Limiting Condition for Operation (LCO) is met. This is especially true when LCO allows continued operation at full power for an extended time.

Please explain how EALs MPS MU 4.2, NAPS MU 4.3, and SPS MU 4.3 will be accurately declared for conditions which indicate a potential degradation of the level of safety of the plant consistent with the declaration of an NOUE classification level.

**RAI 18 (MPS Unit 33, NAPS Units 1 & 2, and SPS Units 1 & 2)**

The proposed threshold value for EALs MPS Unit 3 MU/MA/MS 6.1, NAPS MU/MA/MS 6.1, and MU/MA/MS 6.1, when combined with the proposed basis document discussion, could be interpreted to imply that as long as reactor power is less than 5%, then an emergency declaration is not required, based on either the Mode 1 definition of power operation or the capacity of the plant's decay heat removal systems rather than a failure of the reactor protection system to shut down the reactor. This is not consistent with NEI 99 01, Revision 6, which requires the reactor to be shut down.

All current Dominion reactor protection system failure EAL threshold values, as well as the proposed EAL threshold value for MPS Unit 2, do not present a human factor concern and are consistent with NEI 99 01, Revision 6. Please revise the proposed EALs MPS Unit 3 MU/MA/MS 6.1, NAPS MU/MA/MS 6.1, and MU/MA/MS 6.1, to reflect a reactor shutdown as defined in station emergency operating procedures (EOPs), which include reactor power lowering, or use wording consistent with NEI 99 01, Revision 6.