From:	Guzman, Richard
To:	Shayan.Sinha@dominionenergy.com
Subject:	Millstone Unit 2 - DRAFT Request for Additional Information and Plan for Audit (LAR re: TS 3.8.1.1, A.C. Sources - Operating) [EPID: L-2019-LLA-0177)
Date:	Monday, December 23, 2019 5:33:36 PM

Shayan,

By letter dated August 14, 2019 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML19234A111), as supplemented by letter dated October 22, 2019 (ADAMS Accession No. ML19304A294), Dominion Energy Nuclear Connecticut, Inc. (DENC, the licensee) submitted a license amendment request (LAR) for the Millstone Power Station, Unit No. 2 (MPS2). The proposed license amendment would revise Technical Specification (TS) 3.8.1.1, "A.C. Sources - Operating," to add a one-time exception to the new proposed Required Action a.3 that would extend the allowed outage time (AOT) to 35 days for one inoperable offsite circuit. One-time use of the 35-day AOT would allow replacement of the Millstone, Unit No. 3 (MPS3), 'A' reserve station service transformer, its associated equipment, and other 345 kV south bus switchyard components that are nearing the end of their dependable service life. This work is planned to take place no later than the fall 2023 outage (3R22) for MPS3. In addition, the licensee proposed to add a permanent Required Action a.3 that would provide an option to extend the AOT from 72 hours to 10 days for one inoperable offsite circuit.

To support the review of the proposed license amendment, an audit team consisting of U.S. Nuclear Regulatory Commission (NRC) staff from the Office of Nuclear Reactor Regulation requests to conduct a regulatory audit at the licensee-selected location in the January/February 2020 timeframe. An audit was determined to be the most efficient approach toward a timely resolution of issues associated with this portion of the LAR review, since the staff will have an opportunity to minimize the potential for multiple rounds of requests for additional information (RAIs).

The NRC staff has developed the draft RAI shown below in support of its review of the subject LAR, and in preparation for the audit. The RAI is identified as draft at this time to confirm your understanding of the information needed by the NRC staff to support the audit and complete its evaluation. The NRC staff will use this draft RAI to focus discussions with DENC staff during the audit, and to identify further information to be docketed by the licensee that will be needed by the NRC staff to make final regulatory decisions on the subject LAR. No formal response is requested at this time; however, it is expected that DENC will prepare initial responses to the draft RAI questions for discussion with the NRC audit team during the audit. Following the audit, the NRC staff will issue a final RAI, as needed, to allow the staff to complete the LAR review; and DENC will be requested to submit a formal response on the docket within a specified period.

REGULATORY AUDIT SCOPE OR METHOD

The NRC staff anticipates the interactions would include discussion of the following: (1) the technical acceptability of the internal events and internal flooding Probabilistic Risk Assessment (PRA) used for this application, (2) the informational needs provided in the below draft RAIs to support the NRC staff's review of the application, and (3) the identification of further information that is necessary for the licensee to submit for the NRC staff to reach a regulatory decision.

LOGISTICS
The audit may include interactions (e.g., teleconferences, webinars, or face-to-face interactions) on a mutually agreeable schedule sufficient to understand or resolve issues associated with the available information. The face-to-face interactions would be conducted either in the vicinity of the NRC headquarters or at the licensee's site, if it is determined such interactions are an effective manner to resolve issues identified during the desk portion of the audit.

NEXT STEPS
I'd like to schedule a conference call with your staff sometime the week of January 16 or January 23, 2020, to discuss the attached draft RAI. I also plan to send you an audit plan in preparation for the audit which we can also discuss on the conference call. Please contact me if you have any questions.

Thanks,
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The NRC staff has reviewed the request and determined that additional information is necessary to complete the review to determine if the licensee's proposed change implements the risk informed approach, based on Regulatory Guides 1.174 (Revision 3) (ADAMS Accession No. ML17317A256), and 1.177 (Revision 1) (ADAMS Accession No. ML100910008).
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RAI/Audit Question No. 1 – Internal Fire PRA

Regulatory Position C.2.3.2 of RG 1.177 states that the licensee should perform evaluations of core damage frequency (CDF) and large early release frequency (LERF) to support any risk-informed changes to TS. The scope of the analysis should include all hazard groups (i.e., internal events, internal flooding, fires, seismic events, high winds, and other external hazards) unless it can be shown the contribution from specific hazard groups does not affect the decision. In some cases, a PRA of sufficient scope may not be available. This will have to be compensated for by qualitative arguments, bounding analyses, or compensatory measures.

The licensee stated in the LAR (Attachment 1, Section 4.4.1) that MPS2 does not have an internal fire PRA model. The licensee assessed the fire risk impact qualitatively and stated that the offsite power sources are not listed on the fire safe shutdown equipment list (SSEL) and, therefore, are not considered fire safe shutdown equipment. The licensee concluded that the conditional fire risk of unavailability offsite power sources associated with the LAR is considered negligible. However, the impact of fires in the transformers as well as other switchyard equipment does not appear to be considered in the assessment of the internal fire on this application. In addition, the risk management actions listed in Attachment 3 of the LAR do not include any fire watches.

Justify the exclusion of the impact of fires in the transformers and other switchyard equipment on this application. The justification should include discussion on the lack of internal fire related risk management actions. If necessary, confirm that the proposed change meets the acceptance guidelines after inclusion of the relevant impacts of internal fire risk.

RAI/Audit Question No. 2 – Baseline LERF Inconsistency

The ASME/ANS RA-Sa-2009 PRA standard defines PRA upgrade as the incorporation into a PRA model of a new methodology or significant changes in scope or capability that impact the significant accident sequences or the significant accident progression sequences.

The licensee provides a baseline LERF of 1.27E-06 /yr from the MPS2-R05g model in Table 5-1. The licensee also provides another baseline LERF of 1.33E-06 /yr from the MPS2-R05g model in Section 4.4.1 of Attachment 1 to the LAR.

Explain the inconsistency for the two different baseline LERF values (in Table 5-1 and Section 4.4.1).

RAI/Audit Question No. 3 – High Winds Risk

Regulatory Position C.2.3.2 of RG 1.177 states that the licensee should perform evaluations of core damage frequency (CDF) and large early release frequency (LERF) to support any risk-informed changes to TS. The scope of the analysis should include all hazard groups (i.e., internal events, internal flooding, fires, seismic events, high winds, and other external hazards) unless it can be shown the contribution from specific hazard groups does not affect the decision. In some cases, a PRA of sufficient scope may not be

available.

The licensee evaluated the impacts from high wind and tornado in the LAR (Attachment 5, under Extreme Wind or Tornado, and Hurricane), and screened out high wind and tornado, based on a frequency of occurrence less than 1E-06 per year. Further, several potential failures caused by tornado-generated missiles are also excluded based on their being bounded by the 1E-06 frequency of occurrence. However, the basis for the frequency of occurrence cited by the licensee as well as the frequency being bounding for tornado-generated missile risks is not provided. Further, the discussion does not include consideration of higher frequency high winds events.

Justify the exclusion of the high winds risk from this application including the basis for (1) the cited occurrence frequency, (2) the tornado-generated missile risk being bounded by the occurrence frequency, and (3) lack of consideration of higher frequency high winds events.

RAI/Audit Question No. 4 – Key Assumptions and Sources of Uncertainty

Regulatory Position C of RG 1.174 states: "In implementing risk-informed decisionmaking, LB [licensing basis] changes are expected to meet a set of key principles. … In implementing these principles, the staff expects [that]: … Appropriate consideration of uncertainty is given in the analyses and interpretation of findings. … NUREG-1855 provides further guidance." Additionally, NUREG-1855 Revision 1 identifies EPRI Topical Report (TR) 1016737 and EPRI TR 1026511 as providing guidance for identifying and characterizing key sources of uncertainty.

The licensee stated that a list of MPS2 PRA model assumptions and sources of uncertainty were reviewed to identify those significant to this application. In response to RAI 3 for the LAR to adopt 10 CFR 50.69 "Risk-informed categorization of structures, systems, and components" (ADAMS Accession No. ML19284A397), the licensee explained the process followed for identification of "key" assumptions and sources of uncertainty. It is unclear whether the same approach was followed for this application.

1. Confirm that approach followed for identification of "key" assumptions and sources of uncertainty for this application is identical to that described in response to RAI for the LAR to adopt 10 CFR 50.69.

2. Presumably some assumptions and sources of uncertainty required more evaluation than other assumptions and sources of uncertainty to determine whether they were "key" or not. Provide some discussions and examples illustrating the range of evaluations
   performed, including a summary of any sensitivity studies performed to determine key assumptions for this application.

RAI/Audit Question No. 5 – Credit for FLEX Equipment or Actions

The NRC memorandum dated May 30, 2017, "Assessment of the Nuclear Energy Institute 16-06, 'Crediting Mitigating Strategies in Risk-Informed Decision Making,' Guidance for Risk-Informed Changes to Plants Licensing Basis" (ADAMS Accession No. ML17031A269), provides the NRC's staff assessment of the challenges of incorporating diverse and flexible

(FLEX) coping strategies and equipment into a PRA model in support of risk-informed decision-making in accordance with the guidance of RG 1.200, Revision 2.

In response to RAI 4 for the LAR to adopt 10 CFR 50.69 “Risk-informed categorization of structures, systems, and components” (ADAMS Accession No. ML19284A397), the licensee stated that FLEX equipment is credited in the MPS2 internal events and internal flooding PRA. The licensee also stated that the FLEX equipment failure data will be considered as a source of uncertainty. The human error probability for FLEX actions, especially related to deployment of portable equipment, can also be a source of uncertainty. However, neither of these sources of uncertainty were identified as key for this application and sensitivity studies determining the impact of these sources are not discussed.

1. Clarify whether FLEX diesel generator that was originally credited as a supplemental AC source is credited in the MPS2 internal events and internal flooding PRA.

2. Justify (e.g., using sensitivity studies), that FLEX equipment failure data and human error probability for FLEX actions, especially related to deployment of portable equipment, that are credited in the MPS2 internal events and internal flooding PRA are not “key” assumptions and sources of uncertainty for this application. If FLEX equipment failure data and human error probability for FLEX actions are determined to impact this application, justify the lack of risk management actions, such as pre-testing and staging relevant FLEX equipment.

RAI/Audit Question No. 6 – Parameter Uncertainty and Model Uncertainty

RG 1.174, Section C.2.5 identifies the following types of uncertainty that affect the results of PRAs: parameter uncertainty, model uncertainty, and completeness uncertainty. In accordance with regulatory positions in RGs 1.174 and 1.177, uncertainties should be appropriately considered in the analysis and interpretation of findings. Also, RG 1.174 states, the results of the sensitivity studies should confirm the guidelines are still met even under the alternative assumptions.

In Attachment 5 to the LAR, the licensee addresses three types of probabilistic risk assessment uncertainty. For the parameter uncertainty, the licensee increased the failure rates by a factor of 3 for the switchyard bus failure rate, offsite power transformer failure rate, and switchyard breaker failure rate, and evaluated the conditional CDF and LERF, and calculated ICCDF and ICLERF for one-time 35-day AOT. However, the identified parameter uncertainties as well as the approach for the corresponding sensitivity appear to be similar to the model uncertainty identified by the licensee. The staff is unclear about the difference between the identification and disposition of the parameter and modeling uncertainties. Section C.2.5 of RG 1.174, where parameter uncertainty is evaluated using the probability distributions on the parameter values with considerations of parameter correlation.

1. Discuss the approach used for identifying the three parameter uncertainties stated in Attachment 5 to the LAR.

2. Explain the difference in the basis and approach between the parameter uncertainty, in which three parameters are selected for sensitivity study, and the model

uncertainty, in which one parameter is selected for sensitivity study compared to the modeling uncertainty identified in the same attachment to the LAR.

3. If a clear distinction cannot be drawn between the modeling and parameter uncertainties stated in Attachment 5 to the LAR provide the results of a sensitivity study which include the impact of all identified uncertainties or justify not combining them.

RAI/Audit Question No. 7 – Considerations of Common Cause Failures for $\Delta LOOP_{GR}$

The guidance in RG 1.177, Section 2.3.3.1, states that, "CCF modeling of components is not only dependent on the number of remaining in-service components but is also dependent on the reason components were removed from service (i.e. whether for preventative or corrective maintenance)."

The licensee's determination of the increased grid LOOP occurrence frequency ($\Delta LOOP_{GR}$) does not appear to include common cause failures. The staff notes that there is a potential for common cause failures for the breakers on the "north bus" as well as the transformers considered in determination of $\Delta LOOP_{GR}$.

Justify the exclusion of common cause failures for breakers and transformers in the determination of the increased grid LOOP occurrence frequency or include such failures in the calculation and provide an updated risk assessment. If an updated risk assessment is provided, include the basis for the common cause failure probabilities.

RAI/Audit Question No. 8 – Avoidance of Risk-Significant Plant Configurations

Section C.2.3 of RG 1.177 discusses Tier 2 of the three-tiered approach for evaluating risk associated with proposed changes to TS CT. According to Tier 2, the avoidance of risk-significant plant configurations limits potentially high-risk configurations that could exist if equipment, in addition to that associated with the proposed change, are simultaneously removed from service or other risk-significant operational factors, such as concurrent system or equipment testing, are involved.

Based on configuration-specific insights provided in the LAR (Attachment 1, Section 4.4.1), the licensee performed analyses to identify risk-significant combinations of equipment out-of-service during the extended time and identified further compensatory actions and restrictions for entry into the extended CT to avoid high risk equipment out-of-service combinations during that time. In addition, the licensee provided a list of systems, structures and components (SSCs) whose unavailability should be minimized during the CT, based upon a review pf the quantification results to identify significant equipment outage contributors to CDF an LERF. However, the licensee did not provide the Fussell-Vesely or other importance measures from the PRA model results to support the list.

Provide the Fussell-Vesely or other importance measures from the PRA model results to support that selection of the SSCs for risk management actions.

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