

From: Kuntz, Robert
Sent: Tuesday, March 9, 2021 9:49 AM
To: Jacobson, Ronald G.
Cc: Scott, Sara
Subject: Monticello TSTF-505, Request for Additional Information

Mr. Jacobson,

By letter dated December 16, 2019, (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20090F820) Northern States Power Company, a Minnesota corporation doing business as Xcel Energy (NSPM) submitted a license amendment request (LAR) for the Monticello Nuclear Generating Plant (Monticello). The proposed amendment would modify the Monticello licensing basis to allow implementation of a traveler prepared by the Technical Specification Task Force (TSTF), Traveler 505 (TSTF-505), Revision 2, "Provide Risk-informed Extended Completion Times—RITSTF Initiative 4b" (ADAMS Package Accession No. ML18269A041). The Nuclear Regulatory Commission (NRC) staff determined that additional information was required in completing its review and issued a request for additional information (RAI) (ADAMS ML20302A197). By letter dated December 21, 2020 (ADAMS ML20356A131), NSPM provided a response to the NRC staff RAI. The NRC staff has reviewed the response and determined that additional information is needed to complete the review of the LAR. On March 4, 2021 the NRC staff and NSPM held a teleconference for the NRC Staff to provide clarification on the staff's Draft RAI. Based on the discussion during that teleconference the NRC staff has revised RAI 4.b.01 to clarify the information required. Previously Draft RAI 4.b.01 stated:

RAI 4.b.01 – PRA Model Update Process

Section 2.3.4 of NEI 06-09, "Risk-Managed Technical Specifications (RMTS) Guidelines" (ADAMS Accession No. ML12286A322), specifies "Criteria shall exist in PRA configuration risk management to require PRA model updates concurrent with implementation of facility changes that significantly impact RICT calculations."

In RAI 4 the NRC staff asked the licensee to describe the criteria that would be used to require an unscheduled PRA update, and how the impact on the RICT program is considered when reviewing plant changes or conditions for implementation in the PRA.

The response to RAI 4 states the RICT impact assessment of PRA changes will be conducted on a quarterly basis by assembling and quantifying the latest living PRA model files. The response states that an interim model update occurs when all hazards total core damage frequency (CDF) or large early release frequency (LERF) risk values change by more than twenty-five percent and mentions thresholds for other PRA applications. The RAI response does not explain how the impact on RICT is considered when deciding whether an interim model update is necessary. The NRC staff notes that small increases in baseline CDF or LERF, for individual hazards PRA or total combined all hazards PRA, could translate into a large impact on RICT estimates when equipment is taken out of service.

Explain and justify how the specified numerical criteria of twenty-five percent change in total for all hazards CDF or LERF adequately considers the impact on RICT estimates; alternatively, discuss any additional considerations, qualitative or quantitative, that are taken to address impact on RICTs when deciding whether an interim PRA model update is necessary.

The revised RAI 4.b.01 is provided in the RAI enclosed. As discussed during the March 4, 2021 meeting, NSPM requested 45 days to provide a response to the RAI. Therefore, the NRC staff expects a response to the enclosed RAI on or before March 23, 2021,

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Request for Additional Information
Related to License Amendment Request
to Implement Technical Specification Task Force Traveler
TSTF-505, Revision 2,
“Provide Risk-Informed Extended Completion Times – RITSTF Initiative 4b”
Monticello Nuclear Generating Plant

By letter dated December 16, 2019, (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20090F820) Northern States Power Company, a Minnesota corporation doing business as Xcel Energy (NSPM) submitted a license amendment request (LAR) for the Monticello Nuclear Generating Plant (Monticello). The proposed amendment would modify the Monticello licensing basis to allow implementation of a traveler prepared by the Technical Specification Task Force (TSTF), Traveler 505 (TSTF-505), Revision 2, “Provide Risk-informed Extended Completion Times—RITSTF Initiative 4b” (ADAMS Package Accession No. ML18269A041). The Nuclear Regulatory Commission (NRC) staff has determined that additional information was required in assisting its review (ADAMS ML20302A197). By letter dated December 21, 2020 (ADAMS ML20356A131), NSPM provided RAI responses. However, the NRC staff requests further clarification for some of the response required to complete its review.

RAI 4.b.01 – PRA Model Update Process

Section 2.3.4 of NEI 06-09, "Risk-Managed Technical Specifications (RMTS) Guidelines" (ADAMS Accession No. ML12286A322), specifies "Criteria shall exist in PRA configuration risk management to require PRA model updates concurrent with implementation of facility changes that significantly impact RICT calculations."

In RAI 4 the NRC staff requested a description of the criteria that would be used to require an unscheduled PRA update, and how the impact on the RICT program is considered when reviewing plant changes or conditions for implementation in the PRA.

The response to RAI 4 stated the RICT impact assessment of PRA changes will be conducted on a quarterly basis by assembling and quantifying the latest living PRA model files. The response states that an interim model update occurs if “certain cumulative thresholds (e.g., Mitigating System Performance

Index (MSPI) Birnbaum, delta CDF/LERF)” are met or if a significant impact to a PRA application is predicted. The response further explain that significant impact is defined as all hazards total core damage frequency (CDF) or large early release frequency (LERF) risk values change by more than twenty-five percent. The RAI response does not explain how the impact on RICT is considered when deciding whether an interim model update is necessary. The NRC staff notes that small increases in baseline CDF or LERF, for individual hazards PRA or total combined all hazards PRA, could translate into a large impact on RICT estimates when equipment is taken out of service.

- a) Provide clarification on the additional quantitative criteria, other than the twenty-five percent change in total CDF or LERF, used when deciding whether an interim PRA model update is necessary. Include in this discussion justification how these proposed quantitative criteria ensure that no significant impact on RICT estimates occurs prior to reaching these thresholds.
- b) Discuss any additional considerations (e.g., qualitative), used to assess the impact on RICT estimates when deciding whether an interim PRA model update is necessary.

RAI 9.01 – PRA Model Uncertainty Analysis Process

The NRC staff safety evaluation to NEI 06-09 specifies that the LAR should identify key assumptions and sources of uncertainty and licensees should assess and disposition each as to their impact on the RMTS application. Section 2.3.4 of NEI 06-09 states that PRA modeling uncertainties shall be considered in application of the PRA base model results to the RICT program. It states that sensitivity studies should be performed on the base model prior to initial implementation of the RICT program on uncertainties which could potentially impact the results of a RICT calculation. It also states that the insights from the sensitivity studies should be used to develop appropriate risk management actions (RMAs), including highlighting risk significant operator actions, confirming availability and operability of important standby equipment, and assessing the presence of severe or unusual environmental conditions.

The response to RAI 9 stated that the specific criterion in assessing some sources of uncertainty, as demonstrated in the response to RAI 9.d, is an estimation of the change in risk associated with the uncertainty being qualitatively evaluated as negligible.

The response to RAI 9.d regarding the uncertainty related to rupture of containment with the loss of containment heat removal (CHR) provided an updated sensitivity study that resulted in an increase of twelve and twenty percent in risk for CDF and LERF, respectively. The response evaluated that the risk increase is primarily associated with the control rod drive (CRD) injection due to other failure modes and since the CRD components are not included in the RICT program that this uncertainty would not impact any RICT calculations. The NRC staff notes that although the CRD may not have an associated LCO in scope of the RICT program, other RICTs may be impacted. The response did not demonstrate that this potential source of uncertainty does not have an impact on any RICT calculations.

The response regarding the uncertainty related to reactor core isolation cooling (RCIC) availability after battery depletion provided results of a sensitivity study in which the failure of this operation was tripled. The study appeared to have a small impact on overall risk and demonstrated minimal impact for several RICTs, however it appears to have a larger impact on the RICT estimates for LCO 3.3.5.1.B and 3.8.4.B, of twelve and twenty-five percent, respectively.

Address the following:

- a) Provide justification, such as a sensitivity study, that the source of uncertainty regarding loss of CHR resulting in containment failure does not constitute a key assumption or source of uncertainty. If determined to be key, then provide adequate disposition of this uncertainty for the RICT application. Consistent with the guidance in NEI 06-09-A, this disposition can include discussion of risk management actions (RMAs).
- b) Similarly, it appears that the assumption regarding RCIC operation after battery depletion could constitute a key assumption or source of uncertainty for some RICTs. Provide further disposition of this uncertainty for the RICT application. Consistent with the guidance in NEI 06-09-A, this disposition can include discussion of RMAs.
- c) The response to RAI 9.a states that a total of 33 candidate sources of uncertainty were evaluated for their effects on the calculation of RICTs. The response further details some of the criteria used: uncertainties are qualitatively shown to have a “very small” impact on total risk, and would be expected to have a “negligible impact” on delta-CDF and delta-LERF, or uncertainties are represented through conservative PRA modeling and demonstrate a “negligible impact” on delta-risk RICT calculations.

It’s not clear to the staff that the process described in the response to RAI 9.a and b ensures that key assumptions and sources of uncertainty are adequately addressed. The qualifiers of “very small” and “negligible impact” appears to be key to the appropriate disposition of the PRA assumptions and uncertainties for the RICT application. However, some sources of uncertainty discussed in response to RAI 9.d appeared to have an impact on RICT that are large enough to merit further evaluation. While RMAs may or may not be necessary, assessment of these impacts should be documented.

Discuss how the items of “negligible impact” are considered when addressing impact on the RICT program. Provide confirmation that all key assumptions and sources of uncertainty are and will be identified, appropriately examined, and adequately addressed for the RICT program.

RAI 14.b.01 – PRA Modeling

Regulatory Position 2.3.3 of RG 1.174 states that the level of detail in the PRA should be sufficient to model the impact of the proposed licensing basis change. The characterization of the change should include establishing a cause-effect relationship to identify portions of the PRA affected by the change being evaluated. Full-scale applications of the PRA should reflect this cause-effect relationship in a quantification of the impact of the proposed licensing basis change on the PRA elements.

The NRC staff’s safety evaluation for NEI 06-09 specifies that the LAR should provide a comparison of the TS functions to the PRA modeled functions and that justification be provided to show that the scope of the PRA model is consistent with the licensing basis assumptions.

Regarding unmodeled SSCs, the evaluation states the following:

NEI 06-09, Revision 0, specifically applies the RMTS only to those SSCs which mitigate core damage or large early releases. Where the SSC is not modeled in the PRA, and its impact cannot otherwise be quantified using conservative or bounding approaches, the RMTS are not applicable, and the existing front stop CT would apply.

Further, Item 11 in Section 2.3 of TSTF-505, Revision 2, states:

The traveler will not modify Required Actions for systems that do not affect core damage frequency (CDF) or large early release frequency (LERF) or for which a RICT cannot be quantitatively determined.

Regarding TS LCO 3.7.2.A for emergency service water (ESW) system, the LAR states that ESW is not required to prevent CDF and LERF. In RAI 14.b the NRC staff asked the licensee to justify inclusion of TS LCO 3.7.2.A in the scope of the RICT program. In response to RAI 14.b the licensee stated that ESW provides cooling to the main control room emergency filtration train, emergency core cooling system (ECCS) room coolers, and ECCS pump motor cooling. It further states that a hydraulic analysis determined that no heating, ventilation, and air conditioning systems (HVAC) were required in meeting the PRA mission time of twenty-four hours and therefore HVAC could be excluded from the PRA model. The response however does not appear to justify screening out ESW for pump motor cooling. The NRC staff notes that pump motor cooling is usually related to pump seals and bearings and it is unclear how the HVAC analysis addresses these components. In light of these observations:

- a) Describe and justify the analysis performed to address pump motor cooling requirements, such as pump seals and bearings, and how it was determined that the loss of pump cooling is not required for the twenty-four-hour PRA mission time. Include in this discussion whether this model exclusion has been peer reviewed.
- b) Provide justification why not crediting ESW for ECCS pump motor cooling is not a key assumption or source of uncertainty that could impact the RICT estimates for this system

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