ENCLOSURE 2 CONTAINS ~~SECURITY-RELATED INFORMATION – WITHHOLD FROM PUBLIC DISCLOSURE IN ACCORDANCE WITH 10 CFR 2.390~~

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L-PI-18-038
10 CFR 50.90

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Prairie Island Nuclear Generating Plant, Units 1 and 2
Docket Nos. 50-282 and 50-306
Renewed Facility Operating License Nos. DPR-42 and DPR-60

Supplement to License Amendment Request to Revise License Condition Associated with Implementation of NFPA 805 (EPID L-2018-LLA-0147)

References:

1) NSPM letter to NRC, "License Amendment Request to Revise License Condition Associated with Implementation of NFPA 805", dated May 18, 2018 (ADAMS Accession No. ML18138A402)

2) NSPM letter to NRC, "License Amendment Request to Adopt NFPA 805 Performance-Based Standard for Fire Protection for Light Water Reactors – Response to Request for Additional Information (CAC Nos. ME9734 and ME9735)", dated December 14, 2016 (ADAMS Accession No. ML16350A105)

3) NRC letter to NSPM, "Supplemental Information Needed for Acceptance of Requested Licensing Action Re: Amendment to Modify Renewed Facility Operating License Paragraph 2.C(4)(c) (EPID L-2018-LLA-0147)", dated June 25, 2018 (ADAMS Accession No. ML18169A420)

In accordance with 10 CFR 50.90, Northern States Power Company, a Minnesota corporation (NSPM), doing business as Xcel Energy, requested in Reference 1, an amendment to the Renewed Facility Operating Licenses (RFOLs) for the Prairie Island Nuclear Generating Plant (PINGP), Units 1 and 2. Specifically, NSPM requested that License Condition 2.C(4)(c) be revised in each PINGP RFOL to reflect the deletion of five plant modifications from Table S-2, "Plant Modifications Committed", as submitted in Reference 2. By email dated June 15, 2018, the NRC requested supplemental information in order to complete their acceptance review. On June 20, 2018, members of the NRC staff conducted a conference call with NSPM to provide further clarification regarding the supplemental information requested in the June 15, 2018, email. Subsequently, the NRC provided a request for supplemental information in Reference 3.

Enclosure 1 to this letter provides the supplemental information the NRC requested in Reference 3, as clarified during the June 20 meeting.

Enclosure 2 provides Attachment W, "Fire PRA Insights", Revision 4, which supersedes Revision 3 of Attachment W (Enclosure 6 to Reference 1) in its entirety. The changes made in Revision 4 are annotated with revision bars in the right margin of the pages. Enclosure 2 to this submittal contains security-related information. Accordingly, NSPM requests that Enclosure 2 be withheld from public disclosure in accordance with 10 CFR 2.390(d)(1).

If additional information is required, please contact Mr. Shane Jurek at (612) 330-5788.

Summary of Commitments

This letter makes no new commitments and no revisions to existing commitments.

I declare, under penalty of perjury, that the foregoing is true and correct.
Executed on July 10, 2018.

Scott Sharp
Site Vice President, Prairie Island Nuclear Generating Plant
Northern States Power Company – Minnesota

Enclosures (2)

cc: Administrator, Region III, USNRC
Project Manager, Prairie Island, USNRC
Resident Inspector, Prairie Island, USNRC
State of Minnesota (without Enclosure 2)

RESPONSE TO REQUEST FOR SUPPLEMENTAL INFORMATION

License Amendment Request to Revise License Condition Associated with Implementation of NFPA 805

On May 18, 2018, Northern States Power Company, a Minnesota corporation (NSPM), doing business as Xcel Energy, submitted a license amendment request (LAR) for the Prairie Island Nuclear Generating Plant (PINGP), Units 1 and 2. Specifically, the LAR requested deletion of five modifications NSPM previously committed to install as part of implementation of a risk-informed, performance-based fire protection program in accordance with National Fire Protection Association (NFPA) Standard NFPA 805. By email dated June 15, 2018, the NRC requested supplemental information in order to complete their acceptance review. On June 20, 2018, members of the NRC staff conducted a conference call with NSPM to provide further clarification regarding the supplemental information requested in the June 15, 2018, email. Subsequently, the NRC provided a request for supplemental information. NSPM's response to this request for supplemental information is provided below.

NRC's Request for Supplemental Information

In Enclosure 6 (ADAMS Accession No. ML18138A403, non-publicly available), Attachment W, Section W.2.4, "Review of Negative Delta-Risk," the licensee states that:

> This change was primarily due to the compliant plant not failing a component with a 1.0 failure probability which generates multiple cutsets with a 0.4 CFMLA [circuit failure mode likelihood analysis] probability where these cutsets add up to more than 1.0 in the compliant case and yield a larger CDF [core damage frequency] in the compliant case.

The NRC staff understands that a delta-risk based upon cutsets adding up to more than 1.0 in the compliant case could be problematic, but that this condition could be caused by an invalid application of the rare event approximation. Based on the information provided by the licensee, the NRC staff could not identify the basis for the cutsets adding to more than 1.0; thus, yielding a larger CDF in the compliant case. As a result, the NRC staff requests that the licensee address the following:

Question 1

Whether the cutsets generated from the logic models using a basic event with a failure probability of 0.4 are the same cutsets used when the basic event failure probability is assigned 1.0.

NSPM Response

The cutsets were not the same between the variant and compliant plant quantifications. For example, in Fire Area 30 (referred to as the "Fire Area 30 example" below) there was one cutset with the 21 cooling water pump failure set to TRUE in the variant plant model quantification. In the compliant plant model quantification, there were three cutsets: one cutset included a 0.4 probability for spurious operation of the 21 cooling water pump breaker; one cutset included a 0.4 probability for spurious operation of the source breakers for the electrical bus power supply for the 21 cooling water pump; and one cutset included a 0.4 probability for spurious operation of the direct current support panel for the bus breakers for the 21 cooling water pump. These differences in cutsets are discussed further in NSPM's responses to questions 2 and 3.

Question 2

Describe the circumstance leading to the removal of the 1.0 failure probability to construct the compliant plant model that leads to the condition of multiple cutsets being produced which sum to more than 1.0. For example, is the 1.0 failure probability removed in order to remove the effects of a VFDR [variance from deterministic requirement] to represent the compliant plant model?

NSPM Response

The FRANX fire PRA mapping database includes queries and macros that create the variant plant model and the compliant plant model. A subset of the queries are utilized to apply CFMLA to scenarios. The software code used to create the variant plant model inadvertently omitted one query that should have applied CFMLA to certain scenarios. The Fire Area 30 example highlights the effect of this omission. Since some of the required CFMLA was not applied to the Fire Area 30 example, the 21 cooling water pump failure was set to TRUE in the variant plant model. The software code used to create the compliant plant model included all of the required queries that apply CFMLA, so the 21 cooling water pump failure was not set to TRUE in the Fire Area 30 example scenario. Since the 21 cooling water pump failure was not set to TRUE, the other logically equivalent failures in the fault tree were allowed to propagate. Three components (pump breaker, electrical bus source breaker, and support power for breaker for the 21 cooling water pump) received a 0.4 CFMLA probability in this fire scenario, which resulted in three cutsets with CFMLA events in the compliant plant in lieu of the single cutset in the variant plant.

Question 3

Describe why these multiple cutsets with a Circuit Failure Mode Likelihood Analysis (CFMLA) probability are created when the 1.0 failure probability for the component is removed. For example, as a part of this discussion, if the compliant plant model supports the removal of the fire-induced failure of 1.0 for the component, describe why the component continues to experience fire damage. Describe whether non-minimal cutsets are removed from the compliant plant's cutsets.

NSPM Response

The CFMLA was applied to basic events (pump breaker, electrical source breaker, and support power for the bus breakers), so three cutsets were created, each with a 0.4 probability in the compliant model. This resulted in two issues that needed to be corrected: (1) inconsistent application of CFMLA between quantifications, and (2) creation of additional cutsets that appeared to be non-minimal.

The first issue was due to the missing query in the variant plant database. The missing query resulted in application of CFMLA inconsistently between the variant and compliant models which resulted in the change in quantification results between the two models. Once the missing query was discovered and corrected, the CFMLA was applied equally to both quantifications and the negative delta-risk was eliminated.

The second issue of multiple failure mode cutsets was investigated and found to be due to the method of applying CFMLA at the basic event level instead of at the component level. This resulted in multiple cutsets that appeared to be minimal to each other but were related to the same component failure. The fire PRA model was updated so the CFMLA is applied at the component level instead of the basic event level so that only one cutset is generated for each component failure.

Question 4

Describe why this condition only affects those fire areas with a negative delta-risk. Describe whether this condition could affect other fire areas yet not produce a negative delta-risk.

NSPM Response

While this condition was most apparent in the areas of negative delta-risk, it could affect more than those fire areas with a negative delta-risk due to the missing query in the variant plant quantification. The updated quantification results apply the CFMLA equally between the variant and compliant plant quantifications and show that overall change in results for all fire areas was small (within a few percent) compared to the quantifications associated with NSPM's May 18, 2018, submittal.

Question 5

Describe the impact of requantifying the delta-risk and the additional risk due to recovery actions, including a comparison of the results with the Regulatory Guide [RG] 1.174, Revision 2, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," (ADAMS Accession No. ML100910006) and RG 1.205, Revision 1, "Risk-Informed, Performance-Based Fire Protection for Existing Light-Water Nuclear Power Plants," (ADAMS Accession No. ML092730314), risk guidelines, and whether or not the risk guidelines are met.

NSPM Response

The variant and compliant plant models were updated to correct the issue with the missing query and to remove the multiple cutset issue. CFMLA is only applied once to the component instead of to sub-components that map to multiple basic events (CFMLA is not applied to the DC support panels). The models were re-quantified to calculate the delta-risk and additional risk due to recovery actions. Fire areas that previously had negative delta-risk have been verified to have a delta-risk of zero. There were changes to a number of fire areas, but they were all small (within a few percent) and the RG 1.174 thresholds continue to be met. Enclosure 6 to NSPM's May 18, 2018, submittal, Attachment W, "Fire PRA Insights", Revision 3, has been updated to reflect the re-quantification described herein. Revision 4 of Attachment W is included as Enclosure 2 to this letter. The changes made in Revision 4 are annotated with revision bars in the right margin of Enclosure 2. The identified changes include editorial changes (e.g., deletion of repeated words or extra spaces) in addition to the changes necessitated by requantifying the fire PRA model.