

From: [Hon, Andrew](#)
To: [Zaremba, Arthur H.](#); [Sigmon, Chet Austin](#)
Subject: Request for additional information - Brunswick License Amendment Request to modify its approved 10 CFR 50.69, Risk-Informed Categorization and Treatment of SSC categorization process (EPID: L-2020-LLA-0152)
Date: Thursday, October 29, 2020 10:08:00 AM

By a letter dated July 9, 2020, Duke Energy Progress, LLC submitted a license amendment request (LAR) for the Brunswick Steam Electric Plant, Units 1 and 2 (Brunswick, the licensee), to modify its approved 10 CFR 50.69, "Risk-Informed Categorization and Treatment of Structures, Systems and Components for Nuclear Power Reactors," Categorization Process (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20191A054). The NRC staff is reviewing your submittal and has determined that additional information is required to complete the review. The proposed questions below were discussed by telephone with your team on October 28, 2020. Your team confirmed that the request for additional information (RAI) was understood, it does not contain the proprietary information, and agreed to provide a response by November 29, 2020.

The NRC staff considers that timely responses to RAIs help ensure sufficient time is available for staff review and contribute toward the NRC's goal of efficient and effective use of staff resources. Please note that if you do not respond to this request by the agreed-upon date or provide an acceptable alternate date, we may deny your application for amendment under the provisions of Title 10 of the *Code of Federal Regulations*, Section 2.108. If circumstances result in the need to revise the agreed upon response date, please contact me.

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REQUESTS FOR ADDITIONAL INFORMATION

REGULATORY BASIS

The regulation at 10 CFR 50.69(c)(1)(ii) states, in part, that the SSC categorization process must "determine SSC functional importance using an integrated, systematic process for addressing initiating events (internal and external)," and "all aspects of the integrated, systematic process used to characterize SSC importance must reasonably reflect the current plant configuration and operating practices, and applicable plant and industry operational experience."

The requirement of 10 CFR 50.69(b)(2)(ii) states that the licensee's application contain a description of the measures taken to assure that the quality and level of detail of the

systematic processes that evaluate the plant for internal and external events during normal operation, low power, and shutdown (including the plant-specific PRA, margins-type approaches, or other systematic evaluation techniques used to evaluate severe accident vulnerabilities) are adequate for the categorization of SSCs.

In addition, Regulatory Guide (RG) 1.201, "Guidelines for Categorizing Structures, Systems, and Components in Nuclear Power Plants According to Their Safety Significance," endorses NEI 00-04, which provides guidance on including external events in the categorization of SSCs. Figure 5-6 in Section 5.4 of NEI 00-04 illustrates the process that begins with the SSCs selected for categorization and then proceeds through the flow chart for each external hazard.

RAI 1

Issue:

The LAR requested to use screening of the external flooding (XF) instead of the use of an XF probabilistic risk assessment (PRA) in its 10 CFR 50.69 program. The XF PRA was approved for use in Brunswick's 10 CFR 50.69 program as part of the NRC staff's approval (ADAMS Accession No. ML19149A471). The current LAR proposes screening of the XF hazard in Brunswick's categorization process. The SSCs necessary for mitigation of an XF hazard at Brunswick were included in the XF PRA. The licensee's response in letter dated November 2, 2018 (ADAMS Accession No. ML18306A523), to Request for Additional Information (RAI) 18(e) for the previously approved LAR, identified changes to the internal events PRA model to develop the XF PRA. It is unclear to the NRC staff if any of the SSCs included in the XF PRA are unique to mitigation of the XF hazard at Brunswick, and therefore, are not included in Brunswick's internal events and/or internal fire PRAs. Further, the NRC staff is also unclear whether the proposed screening of XF hazard will appropriately evaluate the categorization of SSC necessary for mitigation of the XF hazard, especially those that are unique to mitigation of the XF hazard.

Request:

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- a. Describe the mitigation of the XF hazard at Brunswick, comparing the SSCs necessary for such mitigation against those necessary for mitigation of other initiators, such as those from internal events and internal fires. The description should identify SSCs that are unique to mitigation of the XF hazard at Brunswick and are not included in the internal events and/or internal fire PRAs.
- b. Describe how the proposed screening of the XF hazard, in conjunction with the previously approved categorization process, will evaluate the categorization of SSCs necessary for mitigation of the XF hazard, especially those that are unique to mitigation of the XF hazard.

RAI 2

Issue:

Section 3.1.5, "SSCs Required for External Flood Screening," of the enclosure to the LAR provides a list of SSCs that, if failed, would result in an unscreened XF scenario for the Combined Effects (CE) storm surge event. The LAR does not mention the use of Figure 5-6 other than for the list in Section 3.1.5 of the enclosure to the LAR. Section 3.1.2, "Local

Intense Precipitation Disposition,” of the enclosure to the LAR states that water accumulation in the equipment access area behind door D-3 will be handled via a permanent passive floor drain and the Reactor Building sump system. However, the floor drains are not included in the list in Section 3.1.5 of the enclosure to the LAR. The licensee's supplement dated February 13, 2019, to the previously approved LAR discussed the potential categorization of floor drains as implicitly modeled components in the context of the XF PRA.

Section 3.1.4 of the enclosure to the LAR discusses the licensee's procedure 0AI-68, “Brunswick Nuclear Plant Response to Severe Weather Warnings, Revision 52,” for response to a CE storm surge event. The licensee's February 13, 2019, supplement is consistent with Section 9.2.2 of NEI 00-04, in that if the failure of an SSC by itself will prevent the successful completion of a risk-significant human action, the SSC will become a candidate high-safety-significant.

However, the current LAR appears to present the list in Section 3.1.5 of the enclosure to the LAR as the complete list of SSCs if Figure 5-6 in NEI 00-04 were for the XF hazard during categorization of SSCs. It is unclear to the NRC staff whether all potential impacts of XF using Figure 5-6 of NEI 00-04 on categorization have been evaluated and how these can be known before the selection of an SSC for categorization.

Request:

- a. Clarify whether the guidance in NEI 00-04 and Figure 5-6 therein will be followed as part of Brunswick's 10 CFR 50.69 program during categorization of SSCs to evaluate the impact of XF on the categorization. If Figure 5-6 will not be followed, justify the deviation from the NRC-endorsed guidance only for XF.
- b. Explain whether the list in Section 3.1.5 of the enclosure to the LAR is a complete list or only a representative list based on the identified modifications. If the list is considered complete, justify how all potential impacts of XF using Figure 5-6 of NEI 00-04 on categorization have been evaluated prior to the selection of an SSC for categorization. Such impacts include, but are not limited to, floor drains, human actions in procedures applicable to the XF hazard, vents and barriers on the fuel oil tank chamber (FOTC) roof (see RAI 6), and any XF-specific mitigation equipment (see RAI 1).

RAI 3

Issue:

Section 3.1.5 of the enclosure to the LAR states that components in the table in that section “would not be categorized as low safety significant (LSS) unless adequate justification is provided to demonstrate that their failure would not result in an unscreened scenario in accordance with NEI 00-04 Figure 5-6.” This statement would be applicable to other components that would be identified as high-safety-significant after following Figure 5-6 in NEI 00-04 (see RAI 1). Table 3-1 of the LAR for Brunswick's previously approved 10 CFR 50.69 program shows that categorization from “Other External Hazards” cannot be changed by the Integrated Decision-Making Panel (IDP). Therefore, it appears to the NRC staff that the discussion in Section 3.1.5 of the enclosure to this LAR is inconsistent with, and potentially a deviation from, the approved 10 CFR 50.69 program.

Request:

- Explain how the proposed approach for categorization of SSCs using Figure 5-6 of NEI 00-04 is consistent with the approved 10 CFR 50.69 program. The explanation should address and justify the apparent inconsistency between the ability of the IDP to change categorization in Table 3-1 of the previous LAR and the statements in Section 3.1.5 of the enclosure to this LAR.

RAI 4

Issue:

Section 3.1.2 of the enclosure to the LAR states that tsunamis, failure of dams and onsite water control/storage structures, and flooding in streams and rivers is considered screened per the “initial preliminary screening criteria” identified in Attachment 3 of the enclosure to the LAR. Section 3.1.3 of the enclosure to the LAR discusses the “initial” screening criteria for local intense precipitation. Section 3.1.4 of the enclosure to the LAR discusses the “preliminary initial” screening criteria for the CE storm surge mechanism. It is unclear why the screening criteria are “preliminary,” “initial,” and “preliminary initial,” as well as how and when the screening criteria will be finalized for review.

The licensee has proposed the use of screening criterion C1, “Event damage potential is less than events for which plant is designed,” for the CE storm surge mechanism in addition to C5, “Event develops slowly, allowing adequate time to eliminate or mitigate the threat.” It appears that the basis for proposing to use the C1 criterion is the flood protection barriers. However, the NRC staff’s understanding is that the current Brunswick licensing basis has not been changed because of the reevaluated flood hazard. Therefore, it is unclear how the “plant is designed” for the reevaluated CE storm surge mechanism.

Request:

- a. Explain why the screening criteria in the above-mentioned sections of the enclosure to the LAR are “preliminary,” “initial,” and “preliminary initial.” Provide the final screening criteria with any additional basis for review by the NRC staff.
- b. Justify the use of the criterion C1, “Event damage potential is less than events for which plant is designed for the CE storm surge mechanism,” given that the current Brunswick licensing basis does not appear to have been changed by the reevaluated hazard.

RAI 5

Issue:

Section 3.1.4 of the enclosure to the LAR states that Brunswick’s procedure 0AI-68 “establishes unambiguous procedural triggers, a clear organizational response, and provides a detailed timeline for carrying out the actions required for the arrival of a CE storm surge event.” The same section of the enclosure to the LAR also states, “...it was concluded that the site response is adequate with more than twice the time margin required to re-perform actions in the event that barrier installation is not completed correctly during the first attempt.” The NRC staff’s assessment of Brunswick’s focused evaluation (FE) based on the reevaluated flooding hazard at the site (ADAMS Accession No. ML18348B185; non-publicly available) stated that because the licensee proposed modifications to the flood protection barriers, “it is expected that Administrative Instruction

0AI-68 be modified to incorporate such changes.” However, the LAR does not discuss such whether the time margin available in 0AI-68 considers these changes.

In addition, Section 3.1.4 of the enclosure to the LAR indicates that the actions in 0AI-68 have been time validated. However, it is unclear whether the validation has been performed via actual implementation or training. It appears to the NRC staff that 0AI-68 is likely to have been invoked in response to recent hurricane events that either impacted or had the potential to impact the Brunswick site. Therefore, it appears that information related to the time margin cited in the LAR is available from actual implementation of the procedure.

Request:

Confirm that the timeline for 0AI-68 discussed in Section 3.1.4 of the enclosure to the LAR considers changes to 0AI-68 to reflect the modifications to the flood protection barriers proposed in Brunswick’s FE, as well as in Attachment 1 of the enclosure to the LAR or justify the representativeness of the timeline and the time margin for 0AI-68 to support the screening of the CE storm surge event. The response can include insights, if available, from recent operational experience in the implementation of 0AI-68 at Brunswick to support the conclusions mentioned in Section 3.1.4 of the enclosure to the LAR regarding “unambiguous procedural triggers,” “detailed timeline for carrying out the actions,” and “time margin required to re-perform actions.”

RAI 6

Issue:

Item (v) in Attachment 1 of the enclosure to the LAR states that the licensee “will confirm all barriers conform to the requirements for flood protection features specified in NEI 16-05 [“External Flooding Assessment Guidelines, Revision 1”], including Appendix B...” Section 3.1.4 of the enclosure to the LAR states that “the operator response, warning time and time required for installation was evaluated against the NRC endorsed NEI 16-05 Appendix C.” NEI 16-05 describes the flooding impact assessment process for use by licensees to close out the 10 CFR 50.54(f) request for information arising from Near-Term Task Force Recommendation 2.1 - Flooding. The context for the development and usage of NEI 16-05, Revision 1, was different from the request by the licensee to amend its licensing basis. The LAR does not include justification for the use of the guidance in NEI 16-05, Revision 1, to support the request.

In item #5 of Enclosure 2 to the licensee’s FE (September 27, 2018, ML18270A372 (publicly available) and ADAMS Accession No. ML18274A336 (non-publicly available)), the licensee stated that it will raise the elevation of the smoke removal vents on the FOTC roof and that it will provide a new debris barrier that protects all penetrations on the FOTC roof. The basis for providing a new debris barrier is to protect all penetrations on the FOTC roof from debris loading associated with the CE storm surge event.

In Section 3.1.4 of the enclosure to the LAR, the licensee stated that the above-mentioned modifications are not required for implementation of 10 CFR 50.69 because the lowest elevations of these vents are above the maximum reevaluated still-water elevation level for the CE storm surge. However, the impact of loading from the flood level and debris on the FOTC vents and roof is not discussed. The loading can result in a situation that challenges the proposed approach for XF hazard consideration in the licensee’s approved 10 CFR 50.69 program. Therefore, it is unclear to the NRC staff that the modifications cited above

are unnecessary for implementation of the 10 CFR 50.69 program.

Request:

Justify the applicability of the guidance in NEI 16-05, Revision 1, to the request. The justification should describe how the guidance in NEI 16-05, Revision 1, provides reasonable assurance to support the screening of the external flooding hazard for the 10 CFR 50.69 program.