From: Mahoney, Michael
Sent: Friday, January 3, 2020 11:40 AM
To: Vaughan, Jordan L
Cc: Art Zaremba
Subject: Catawba PT Limits LAR - RAIs

Follow Up Flag: Follow up
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Jordan,

By letter to the U.S. Nuclear Regulatory Commission (NRC) dated On July 2, 2019 (Agencywide Documents Access Management System (ADAMS) Accession No. ML19183A038), Duke Energy, (the licensee), requested amend the unit-specific pressure-temperature (P-T) limit curves in Technical Specification (TS) Figure 3.4.3-1, "(Unit 1 Only) RCS Heatup Limitations," and TS Figure 3.4.3-2, "(Unit 1 Only) RCS Cooldown Limitations," as effective to 42.7 effective full powers years (EFPY) of licensed operations. The licensee's submittal enclosed supporting information in Westinghouse Electric Company (WEC) Technical Report Nos. WCAP-15448, Revision 1 (Enclosed in ADAMS Accession No. ML19183A038) and WCAP-17669-NP, Revision 0 (ADAMS Accession ML14353A029).

The NRC staff has reviewed the application and, based upon this review, determined that the following additional information is needed to complete our review:

RAI-01 (SNSB)

The NRC staff requests the licensee to justify the acceptance of the LTOP analysis assuming relief valve setpoints lower than those allowed in TS Limiting Condition for Operation (LCO) 3.4.12, to support plant operation to 42.7 EFPY for Catawba, Unit 1.

RAI-02 (SNSB)

On page 5 of the LAR, the licensee indicated that the calculated new limiting pressure for the heatup and cooldown curve at 42.7 EFPY is 1,089 psig for the reactor vessel beltline region and remains 621 psig for the Closure Head/Vessel Flange region. Both pressure limits include measurement uncertainty, while the pressure limits presented in Figure 3.4.3-1 and Figure 3.4.3-2 do not include margin for instrument errors.

The NRC staff requests the licensee to demonstrate that the calculated pressure limits of 1,089 psig and 621 psig are consistent with the pressure limits shown in Figures 3.4.3-1 and 3.4.3-2 in Attachment 1 to the LAR.

RAI-03 (SFNB)

As part of its review, NRC staff made comparisons between the post-measurement uncertainty recapture (MUR) fluence results presented in the submittal and those of the pre-MUR fluence results presented in WCAP-15448, Revision 1. The fluence results from the submittal were interpolated to 51 EFPY before comparisons were made to the WCAP-15448, Revision 1 fluence results at 51 EFPY. The comparisons indicate an approximate 16.2 percent decrease in post-MUR fluence versus pre-MUR fluence at the clad/base metal interface and the 1/4T and

3/4T depths for the same beltline materials. Given that the Catawba, Unit 1 MUR increased the rated thermal power by approximately 1.7 percent, which will result in a linear increase in core flux, a decrease in post-MUR fluence of 16.2 percent for the same EFPY is unexpected. The results suggest there may be an inaccuracy in the fluence calculation or an unaccounted-for uncertainty, which must be taken into consideration for an accurate fast neutron fluence calculation in order to estimate the fracture toughness of the reactor vessel.

10 CFR Part 50, Appendix G, “Fracture Toughness Requirements” and 10 CFR 50.61, “Fracture Toughness Requirements for Protection Against Pressurized Thermal Shock Events” set forth requirements for fracture toughness on the reactor pressure vessel materials. In order to estimate the fracture toughness, it is necessary to accurately determine the fast neutron fluence (E > 1MeV).

The NRC staffs request the licensee to provide justification that the post-MUR fluence results presented in the submittal are accurate in light of the 16.2 percent reduction seen in comparison to the pre-MUR results. Conversely, if an inaccuracy or uncertainty is present, provide updated fluence results and a discussion of the identified inaccuracy or uncertainty.

Please provide a response to the above RAIs, on the docket, within 45 days of the date of the correspondence.

Once this email is added to ADAMS, I will provide the accession number for your reference.

Thanks
Mike

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