From: Lamb, John
Sent: Wednesday, January 26, 2022 1:22 PM
To: Lowery, Ken G.
Subject: REQUEST FOR ADDITIONAL INFORMATION - Vogtle, Units 1 and 2, TS 3.7.2 LAR (EPID: L-2021-LLA-0178)

Importance: High

Ken,

By letter dated September 30, 2021 (Agencywide Documents Access and Management System Accession No. ML21274A073), to the U.S. Nuclear Regulatory Commission (NRC), Southern Nuclear Operating Company (SNC, the licensee) submitted a license amendment request (LAR) for Vogtle Electric Generating Plant (Vogtle), Units 1 and 2. The proposed amendment would revise the Vogtle, Units 1 and 2, Technical Specification (TS) 3.7.2 "Main Steam Isolation Valves (MSIVs)". The TS Limiting Condition for Operation (LCO) currently requires two MSIV systems per main steam line be operable in Mode 1, and Modes 2 and 3 with exceptions. The licensee proposes to change TS 3.7.2, LCO, to require four MSIVs and their associated actuators and associated bypass valves be operable in Mode 1, and Modes 2 and 3 with exceptions.

After reviewing the LAR, the NRC staff requests a response to the request for additional information (RAI) given below.

On January 19, 2022, the NRC staff provided draft RAI questions to SNC to make sure that the RAIs are understandable, the regulatory basis is clear, to ensure there is no proprietary information, and to determine if the information was previously docketed. On January 26, 2022, a clarifying call was held and SNC stated that it would provide the RAI response within 30 days of the date of this email.

If you have any questions, you can contact me at 301-415-3100.

Sincerely,

John

REQUEST FOR ADDITIONAL INFORMATION (RAIs)

By letter dated September 30, 2021 (Agencywide Documents Access and Management System Accession No. ML21274A073), to the U.S. Nuclear Regulatory Commission (NRC), Southern Nuclear Operating Company (SNC, the licensee) submitted a license amendment request (LAR) for Vogtle Electric Generating Plant (Vogtle), Units 1 and 2. The proposed amendment would revise the Vogtle, Units 1 and 2, Technical Specification (TS) 3.7.2 "Main Steam Isolation Valves (MSIVs)". The TS Limiting Condition for Operation (LCO) currently requires two MSIV systems per main steam line be operable in Mode 1, and Modes 2 and 3 with exceptions. The licensee proposes to change TS 3.7.2, LCO, to require four MSIVs and their associated

actuators and associated bypass valves be operable in Mode 1, and Modes 2 and 3 with exceptions.

After reviewing the LAR, the NRC staff requests response to the request for additional information (RAI) given below.

Regulatory Basis

The regulatory requirements for which the ARCB staff bases its request for additional information are the accident dose guidelines of Title 10 of the Code of Federal Regulations (10 CFR) Section 100.11, as supplemented by accident-specific criteria in Section 15 of the Standard Review Plan (SRP).

100.11 Determination of exclusion area, low population zone, and population center distance. (a) As an aid in evaluating a proposed site, an applicant should assume a fission produce release1 from the core, the expected demonstrable leak rate from the containment and the meteorological conditions pertinent to his site to derive an exclusion area, a low population zone and population center distance. For the purpose of this analysis, which shall set forth the basis for the numerical values used, the applicant should determine the following:

> *(1) An exclusion area of such size that an individual located at any point on its boundary for two hours immediately following onset of the postulated fission product release would not receive a total radiation dose to the whole body in excess of 25 rem2 or a total radiation dose in excess of 300 rem2 to the thyroid from iodine exposure.*
>
> *(2) A low population zone of such size that an individual located at any point on its outer boundary who is exposed to the radioactive cloud resulting from the postulated fission product release (during the entire period of its passage) would not receive a total radiation dose to the whole body in excess of 25 rem or a total radiation dose in excess of 300 rem to the thyroid from iodine exposure.*

Background:

In Section 3.3 of the LAR, under the title “SGTR [Steam Generator Tube Rupture] Transient Response and Margin to Overfill”, the licensee states that in response to Westinghouse Nuclear Safety Advisory Letter (NSAL)-06-15 an audit was conducted. The audit has found that “Additionally, the analysis documented that the SGTR mass releases associated with the single failure MSIV scenario were non-limiting with respect to input to the SGTR offsite dose consequence analysis”

In discussion of SGTR Offsite Dose Consequences, the results of this audit are relied upon to state that “the branch line steam flow (both instantaneous flow and integrated flow) resulting from a single failure of an MSIV is less than that from a single failure due to a loss of control room control of an ARV [Atmospheric Relief Valve] on the faulted steam generator.”, and conclude “Therefore, the offsite dose consequences currently documented in UFSAR Section 15.6.3 resulting from a SGTR event remain bounding.”

ARCB-RAI-8

Please provide the audit report which addresses Westinghouse Nuclear Safety Advisory Letter (NSAL)-06-15, or a summary of the report which addresses SGTR offsite dose consequences and the bounding assumptions which supports the above conclusion.

EMIB-RAI-9

Section 2.3, "Reason for Change," on page E-2 states that:

> The reduction from two MSIV systems per steam line to one MSIV per steam line is requested to improve the design and reliability of the system. The current MSIV actuators are Rockwell A-290 hydraulic actuators. These actuators utilize a compressed nitrogen hemisphere as the motive force to push hydraulic fluid from the valve cylinder, driving the valve to the closed position. In order for the valve to remain open, adequate hydraulic pressure must be maintained at all times to overcome the force of the compressed nitrogen. As a result, there are many mechanisms by which these valves can fail closed.

There have been six plant trips at Vogtle since 2012 due to inadvertent closure of one or more MSIVs. The NRC staff reviewed the six MSIV failures provided (in the Basis for Change Table on Page E-3) that have occurred since 2012 resulting in a plant trip. Five of those failures appear to have been maintenance preventable. Three MSIV failures were due to human performance. One MSIV failure was caused by the valve stem becoming brittle. One MSIV failure could be addressed by applying a periodic component change-out task. Only one MSIV failure was due to hydraulic pressure.

a. Please explain how the proposed reduction from two MSIVs per steam line to one MSIV per steam line will improve the design and the reliability of the system in light of the six MSIV failures.
b. Please explain how maintenance preventable failures of MSIVs (as specified in the Table on Page E-3) would be eliminated by removing one out of two MSIVs per steam line.

EMIB-RAI-10

Section 3.2, "Impacts on Physical Plant Change," Item "Inservice Testing Program," page E-13 states:

> Inservice Test Program and Inservice Inspection Program will be evaluated in accordance with 10 CFR 50.55a to determine what, if any, program changes are required. The programs will be updated accordingly.

The licensee is requested to specify its commitment to maintain all MSIVs in the IST Program following implementation of the LAR.

EMIB-RAI-11

The proposed changes to Vogtle Units 1 and 2 TS Surveillance Requirement (SR) 3.7.2.1 adds "bypass valve." The Frequency column states "In accordance with the INSERVICE TESTING PROGRAM."

Please specify the newly added bypass valve(s) in the IST Program and provide the IST Program modification with all MSIVs and bypass valves identified with identification numbers.

EMIB-RAI-12

Section 3.2, "Impacts of the Physical Plant Change," Item "Seismic, Pipe Stress, High Energy Line Break evaluation," states:

> Pipe stress analyses are performed on the main steam line to confirm that the main steam piping and supports continue to withstand appropriate dynamic effects following the installation of the new actuator. Pipe stress analyses are also performed on the new vent line piping routed to the main steam safety relief valve vent line. Existing pipe supports for the replacement MSIV actuators are reevaluated accordingly, and small-bore piping supports are installed on the new vent line piping.

a. Please explain whether the new and modified pipe stress analyses contain any snubbers (including deleted or added snubber(s)) and the effect of the LAR implementation on the snubber(s) hot and cold settings and Snubber Inservice Examination and Testing Program.

b. Please clarify whether the results of the new and modified pipe stress analyses continue to meet the applicable ASME Section III Class 2 piping design requirements.

EMIB-RAI-13

As stated in Section 3.2 of the LAR, the licensee performed pipe stress analyses for the new and modified main steam line. The licensee stated that both before and after MSIV actuator replacement, stresses in this section of piping are sufficiently low that, with other manufacturing restrictions (material grade and inspections, etc.), the piping remains exempt from the requirements for pipe break postulation (i.e., the no-break zone piping). In Section 3.4, "Justification of Single MSIV Design," Item "Discussion," the licensee also stated that the no-break zone piping is designed to meet the NRC Branch Technical Position MEB 3-1 staff's guidelines so that the piping failures need not be postulated.

a. Please clarify whether the scope of the no-break zone piping identified in the Vogtle UFSAR Section 3.6., "Postulated Piping Failures in Fluid Systems Inside and Outside Containment," would be affected by this LAR implementation. If yes, the applicable UFSAR sections would need to be updated accordingly.

b. Please clarify whether the design provisions and the inservice examination requirements for the no-break zone piping within the scope of this requested LAR would be consistent with those applicable design criteria and the augmented inservice examination requirements set forth in the Vogtle UFSAR Section 3.6.1 and Table 3.6.1-3, "Design Comparison to NRC Branch Technical Position MEB 3-1."

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Created By: John.Lamb@nrc.gov

Recipients:
"Lowery, Ken G." <KGLOWERY@southernco.com>
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