

August 31, 2023

NL-23-0695
10 CFR 50.90U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001Vogtle Electric Generating Plant Units 3 and 4
Docket Nos.: 52-025 & 52-026Subject: Response to Round 2 Request for Additional Information Regarding License
Amendment Request for Technical Specification 3.8.3, Inverters – Operating, Completion Time
Extension (LAR-22-002S2)

Ladies and Gentlemen:

On January 3, 2023, pursuant to 10 CFR 52.98(c) and in accordance with 10 CFR 50.90, Southern Nuclear Operating Company (SNC) submitted License Amendment Request (LAR) 22-002 per ND-22-0881 requesting an amendment to the combined licenses (COLs) for Vogtle Electric Generating Plant (VEGP) Units 3 and 4 (License Numbers NPF-91 and NPF-92, respectively) (ADAMS Accession Number ML23003A797). The LAR proposes changes to COL Appendix A, Technical Specifications (TS) 3.8.3, Inverters – Operating, to extend the Completion Time for Required Action A.1.

On May 17, 2023, the Nuclear Regulatory Commission (NRC) Staff issued a final Request for Additional Information (RAI) (ADAMS Accession No. ML23137A216) seeking clarifications related to the requested LAR. On June 13, 2023 (ADAMS Accession Number ML23164A270) SNC submitted responses to the RAI.

On August 9, 2023 the NRC Staff issued round 2 RAI (ADAMS Accession Number ML23188A151). On August 17, 2023 a clarification call was conducted. This letter submits a second supplement to LAR-22-002. Enclosure 3 provides the responses to the second round RAI.

This supplement does not impact the scope or conclusions of the Technical Evaluation, Significant Hazards Consideration Determination, or Environmental Considerations of the original submittal.

This letter contains no regulatory commitments. This letter has been reviewed and determined not to contain security-related information.

In accordance with 10 CFR 50.91, SNC is notifying the State of Georgia by transmitting a copy of this letter and its enclosure to the designated State Official.

Should you have any questions, please contact Amy Chamberlain at (205) 992-6361.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 31st of August 2023.

Respectfully submitted,



Jamie Coleman
Director, Fleet Regulatory Affairs
Southern Nuclear Operating Company

Enclosure: [Provided with LAR-22-002]

Enclosure 2: [Provided with LAR-22-002S1]

Enclosure 3: Responses to Round 2 Requests for Additional Information (LAR-22-002S2)

cc:

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Southern Nuclear Operating Company

**NL-23-0695
Enclosure 3**

Vogtle Electric Generating Plant (VEGP) Units 3 and 4

**Responses to Round 2 Requests for Additional Information
(LAR-22-002S2)**

(Enclosure 3 consists of 6 pages, including this cover page.)

On January 3, 2023, Southern Nuclear Operating Company (SNC) submitted License Amendment Request (LAR) 22-002 per ND-22-0881 requesting an amendment to the combined licenses (COLs) for Vogtle Electric Generating Plant (VEGP) Units 3 and 4 (License Numbers NPF-91 and NPF 92, respectively) (ADAMS Accession No. ML23003A797). On May 17, 2023, the Nuclear Regulatory Commission (NRC) Staff issued final Request for Additional Information (RAI) (ADAMS Accession No. ML23137A216) seeking clarifications related to the requested LAR. On June 13, 2023 (ADAMS Accession Number ML23164A270) SNC submitted responses to the RAI. On August 9, 2023 the NRC Staff issued round 2 RAI (ADAMS Accession Number ML23188A151). This letter submits a second supplement to LAR-22-002.

The NRC Round 2 RAI and SNC responses follow.

NRC Followup RAI #2:

In the response to RAI #2, SNC provided that the 14-day Completion Time is justifiable because the ICCDP and ICLERP are demonstrated to have a small impact (i.e., less than 1 E-6 and 1 E-7, respectively). Since VEGP Units 3 & 4 PRAs are at various stages of completion and do not yet fully reflect as-built, as operated plants, there are uncertainties regarding the assumptions made in the PRA model development in support of the application. As such, the staff requests the licensee to describe applicable uncertainty analyses and/or sensitivity studies that were performed in support of the application to assure acceptability of the PRA results and that the quantitative results accurately reflect plant conditions. This information is being requested to support a determination that uncertainties in the PRA models have been properly addressed in accordance with RG 1.177, Section 2.3.5.

SNC Followup RAI #2 Response:

A review of the key assumptions and uncertainty notebook for each quantified hazard as well as external events was performed. The review focused on aspects of uncertainty relevant to the application, such as those concerning the IDS system, the inverter in particular, or more generally electric power or loss of offsite power. The review did not identify any sources or assumptions that would be impactful to the overall results presented in the LAR.

During the review, one modeling assumption was identified as a potential impact to the conclusions. In the Vogtle 3&4 base PRA used for this application, it is assumed that loss of offsite power (LOSP) is unrecoverable. This is a conservative assumption in the base case. Since this is a base case assumption that, if modeled, could reduce the base case CDF/LERF values and theoretically have an impact on the change (delta) in CDF/LERF, the sensitivity was performed by decreasing the LOSP frequency in both the base and application cases as a surrogate for modeling LOSP recovery. The result of this sensitivity was a decrease in the delta CDF/LERF for this application. Therefore this modeling assumption is not impactful to the overall results presented in the LAR.

Another relevant assumption is that the industry/generic data used in the PRA is representative of the plant performance going forward. A sensitivity assuming higher unreliability only for the inverter would result in a decreased RAW value for the inverter and a lower delta CDF/LERF. Extending higher unreliability across all plant systems could result in somewhat higher delta CDF/LERF values. The results presented in the LAR showed that the ICCDP/ICLERP values were well within RG 1.174/RG 1.177 thresholds even if considering a 30 day completion time. Expected

minor perturbations from industry-wide generic data would have to result in approximately quadruple the stated delta CDF/LERF in order to approach an impact to the quantitative conclusions (results less than 1E-6 ICCDP and less than 1E-7 ICLERP) presented in the LAR for the 14 day completion time. Since both the base and application cases would be impacted by changes to baseline reliability, such an impact was judged to be highly improbable. Therefore, sensitivities related to lack of performance data/plant-specific data were not performed.

SNC concludes that the quantitative results considered uncertainty and assumptions and are acceptable for use in this application.

NRC Followup RAI #4:

10 CFR 50.36(c)(2) requires that when TS LCOs are not met, the licensee shall shut down the reactor or follow remedial actions permitted by the TS until the condition can be met. TS Section 1.3, "Completion Time," states that LCOs specify minimum requirements for ensuring safe operation of the unit. "ACTIONS" for an LCO state "Conditions" that usually describe ways in which the LCO requirements can fail to be met and that specify Required Action(s) and CT(s). Required Actions must be completed prior to the expiration of the specified CT.

LAR Section 1 states that "the proposed change would revise COL Appendix A, TS 3.8.3, Inverters – Operating, to extend the CT for Required Action A.1 from 24 hours to 14 days." The LAR indicates that VEGP Units 3 and 4 have no direct operating experience related to maintenance for the specific VEGP inverter. LAR Table 1 provides industry operating experience supporting CT extensions for inoperable inverters beyond 24 hours with the most common extension being 7 days or slightly beyond. To support a TS change request, RG 1.177, Section C.2 provides guidance for licensees that it: (1) provide a strong technical bases rooted in deterministic engineering and system analyses, (2) ensure it is not based on PRA results alone, and (3) give proper attention to the integration of considerations, such as conformance to the STS...**and practical considerations for test and maintenance** (bold text added for emphasis).

RG 1.177, Section C.2.3.3.1 presumes that a PRA should model specific components at system-train or at component level, and their component unavailability models should include contributions from...test and maintenance downtimes.

For TS 3.8.3.A.1, the Required Action is restoration of one or more inoperable inverters in one division. The staff needs additional information that supports the proposed CT change to 14 days. The staff will be challenged to make its reasonable assurance finding without a sufficient deterministic justification that addresses the "practical considerations for test and maintenance" activities.

Consistent with RG 1.177, a strong technical basis (i.e., deterministic) for a TS change request includes practical considerations for test and maintenance, with test and maintenance downtimes being readily available and necessary for PRA models per RG 1.177, Section C.2.3.3.1. SNC has discussed the current CT time requirement, 24 hours, and provided other industry CT examples ~7 days, and the staff is assessing the justification beyond 7 days using

information provided by SNC. This proposal is significant because it requests a new minimum CT for safe operation beyond what has been previously approved and sufficiently justified.

SNC cites the term “unforeseen difficulties” in its previous RAI response as part of their justification. The staff will be challenged to make a safety determination on the LAR given that the phrase “unforeseen difficulties” does not provide a timeframe for inverter maintenance and testing that the staff can evaluate and derive its deterministic safety conclusion that a permanent TS change to a 14-day CT is appropriate. Staff also notes that there are mechanisms in place to address unforeseen difficulties (e.g., notice of enforcement discretion) and that the proposed TS change should take into account typical evolutions with appropriate justification.

Accordingly, the staff requests an estimated time to repair and/or replace an inverter (i.e., repair activities in hours/days with margin) to facilitate its restoration to OPERABLE status in accordance with 10 CFR 50.36, TS 1.3, and guidance in RG 1.177. The inverter time to repair should not include pre-maintenance activities such as training of SNC staff or lead time for replacement parts. The estimated repair time should include those maintenance tasks and plant activities specific to the repair and restoration of the inverter, which can also be based on past operating experience or vendor recommendations.

SNC Followup RAI #4 Response:

As described in NUREG-0800, Section 16.1, Risk-informed Decision Making: Technical Specifications, in August 1995, the NRC adopted the policy statement for the expanded use of PRA (USNRC, "Use of Probabilistic Risk Assessment Methods in Nuclear Activities: Final Policy Statement." Federal Register, 60 FR 42622, August 16, 1995). One goal included “to reduce unnecessary conservatism in current regulatory requirements.” This discussion noted that in approving the policy statement, the Commission expected its implementation to improve the regulatory process in three areas: foremost, through safety decision-making enhanced by PRA insights; through more efficient use of agency resources; and through a reduction of unnecessary burdens on licensees.

The requested revised Completion Time is focused on these expectations:

- a. Conservative PRA insights are provided within the LAR and prior supplement.
- b. Efficient use of agency resources would be achieved by minimizing short turnaround evaluations for regulatory relief requests (i.e., emergency TS change or enforcement discretion) when inverter restoration efforts exceed approximately half of the allowed Completion Time. It is considered prudent preparation to initiate such requests when the potential for an unnecessary plant shutdown is imminent (i.e., within the time it would take to process, evaluate, and approve such a request). As such, a 7-day Completion Time affords only a practical 3-to-4 days for restoration prior to unnecessarily engaging agency resources when the most likely (based on cited industry experience) conclusion is completion of the restoration within 7 days. A 14-day Completion Time would allow for the efficient use of agency resources by providing for a full 7-day window prior to having to initiate activities involving agency resources.

- c. The above discussion of the impact on agency resources equally reflect an unnecessary burden on the licensee to prepare for and initiate short turnaround regulatory relief requests. Additionally, imposing shorter repair windows with no safety benefit has the impact of setting artificial priorities that may interfere with other planned test and maintenance activities. Minimizing short-term artificial priorities with no safety benefit allows for appropriate practical considerations for test and maintenance.

Making efficient use of agency resources and minimizing unnecessary burdens on the licensee are also consistent with RG 1.177, which acknowledges “A licensee may request the TS change to reduce unnecessary burdens in complying with current TS requirements” and further acknowledges “In some cases, the change may provide operational flexibility; in those cases, the change might allow increased allocation of the plant personnel’s time to more safety-significant aspects.”

“Practical considerations for test and maintenance” include the above mentioned burdens associated with an impending required plant shutdown or need to exercise requests for regulatory relief. Imposing shorter repair windows with no safety benefit has the impact of setting artificial priorities that may interfere with other planned or ongoing test and maintenance activities. Minimizing short-term artificial priorities with no safety benefit allows for appropriate practical considerations for test and maintenance. Furthermore, the change does not impact the practicality of returning plant systems to fully operable status in a timely manor; there is no incentive to delay restoration of an inoperable inverter. Practical considerations include evaluating risk profiles and appropriate compensatory measures prior to any planned inverter testing or maintenance and with any subsequent change in plant conditions.

The original LAR Section “Industry Experience Related to Inverter Maintenance” provided industry experience and timeframes for inverter maintenance and testing, which SNC cited in the first LAR supplement to conclude that these typical maintenance activities and maintenance timeline durations for restoration would be generally consistent with future anticipated VEGP experience. This industry experience demonstrates that restoration durations exceeding 3-to-4 days (and therefore crossing a threshold for engaging agency and licensee resources as discussed above) would not be uncommon.

It is also noted that previous NRC staff approvals of generic Completion Time extensions addressed the RG 1.177 “practical considerations for test and maintenance activities” without explicit individual timelines for restoration activities that would demonstrate experience suggesting the time limits might be approached. TSTF-505, Provide Risk-Informed Extended Completion Times – RITSTF Initiative 4b, approved a deterministic “backstop” of 30 days when applying risk-informed evaluations for Completion Time extensions, and allowed this application to Inverter Completion Times without specific and detailed restoration timelines.

In summary, specific maintenance and testing timelines are not presented in regulatory guidance as an overriding deterministic criterion when those timelines are not shown necessary to provide for reasonable assurance of adequate protection of the public health and safety; especially when other deterministic criteria (e.g., defense in depth and margins to safety) have been adequately demonstrated.

The following is a hypothetical corrective maintenance scenario with an estimated time to repair and/or replace an inverter, recognizing that the actual equipment maintenance required for any given emergent issue would be different in each case. It is reasonable to assume 30% variability in the estimated times; yielding potential corrective action range of between 4 days and 16 hours to 8 days and 16 hours. Two issues could reflect the more variability in the estimated times: (1) the

amount of time required to arrange onsite vendor support could take five or more days depending on travel variability, and (2) the lead time for obtaining qualified replacement parts from the international vendor could have a significant impact in the timeline below, however, for this scenario it is assumed that all parts are on hand.

VEGP postulated scenario for failure of inverter 3-IDSA-DU-1 with no known cause:

ACTIVITY DESCRIPTION	DURATION
Assemble Issue Resolution Team for Failure of 3-IDSA-DU-1	6 hours
Develop Troubleshooting Game Plan for Failure of 3-IDSA-DU-1	12 hours
Plan Troubleshooting Work Order for Failure of 3-IDSA-DU-1	6 hours
Arrange Onsite Vendor Support	72 hours
Implement Troubleshooting Game Plan for Failure of 3-IDSA-DU-1	12 hours
Hang Permit for Inverter 3-IDSA-DU-1	3 hours
Plan Rework Work Order for Inverter 3-IDSA-DU-1	12 hours
Install new cards for Inverter 3-IDSA-DU-1	8 hours
Perform Deenergized Testing of Inverter 3-IDSA-DU-1	12 hours
Release Permit Following Rework of Inverter 3-IDSA-DU-1	3 hours
Energize Inverter 3-IDSA-DU-1	2 hours
Perform Energized Calibration & Testing on Inverter 3-IDSA-DU-1	12 hours

TOTAL TIME: 6 days 16 hours