



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NEW REACTORS
RELATED TO AMENDMENT NOS. 149 AND 148
TO THE COMBINED LICENSE NOS. NPF-91 AND NPF-92, RESPECTIVELY
SOUTHERN NUCLEAR OPERATING COMPANY, INC.
GEORGIA POWER COMPANY
OGLETHORPE POWER CORPORATION
MEAG POWER SPVM, LLC
MEAG POWER SPVJ, LLC
MEAG POWER SPVP, LLC
CITY OF DALTON, GEORGIA
VOGTLE ELECTRIC GENERATING PLANT UNITS 3 AND 4
DOCKET NOS. 52-025 AND 52-026

1.0 INTRODUCTION

By letter dated August 27, 2018 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML18239A375), the Southern Nuclear Operating Company (SNC) requested that the Nuclear Regulatory Commission (NRC or the Commission) amend Vogtle Electric Generating Plant (VEGP) Units 3 and 4, Combined License (COL) Numbers NPF-91 and NPF-92, respectively. The License Amendment Request (LAR) 18-022 proposes to depart from information in the Updated Final Safety Analysis Report (UFSAR) (which includes the plant-specific Design Control Document (DCD) Tier 2 information) and involves related changes to plant-specific Tier 1 information, with corresponding changes to the associated COL Appendix C information.

The LAR proposes to add vent lines to the piping between the passive core cooling system (PXS) collection boxes and in-containment refueling water storage tank (IRWST) to remove entrained air and improve the drain line flow rates. The UFSAR Figure 6.3-1 Sheet 2 is modified to add the vents to the figure. The proposed change involves the plant-specific Tier 1 information and the corresponding COL Appendix C, Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) Information to revise Table 2.2.3-2 to add the vent lines to the listed IRWST gutter drain lines.

Pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 52.63(b)(1), SNC also requested an exemption from the provisions of 10 CFR Part 52, Appendix D, "Design

Certification Rule for the AP1000 Design,” Section III.B, “Scope and Contents.” This exemption request will allow a departure from the corresponding portions of the certified information in Tier 1 of the generic DCD.¹ In order to modify the UFSAR (the PS-DCD) Tier 1 information, the NRC must find the licensee’s exemption request included in its submittal for the LAR to be acceptable. The NRC staff’s review of the exemption request, as well as the LAR, is included in this safety evaluation.

2.0 REGULATORY EVALUATION

The requested amendment revises the COL and licensing basis documents to add vent lines to the piping between the PXS collection boxes and IRWST to remove entrained air and improve the drain line flow rates. Tier 1 information is defined in 10 CFR Part 52, Appendix D Section II.D.

The NRC staff considered the following regulatory requirements in reviewing the LAR that included the proposed changes:

10 CFR Part 52, Appendix D, Section VIII.A.4 states that exemptions from Tier 1 information are governed by the requirements of 10 CFR 52.63(b)(1) and 10 CFR 52.98(f). It also states that the Commission will deny such a request if the design change causes a significant reduction in plant safety otherwise provided by the design.

10 CFR Part 52, Appendix D, Section VIII.B.5.a allows an applicant or licensee who references this appendix to depart from Tier 2 information, without prior NRC approval, unless the proposed departure involves a change to or departure from Tier 1 information, Tier 2* information, or the Technical Specifications, or requires a license amendment under paragraphs B.5.b or B.5.c of the section.

10 CFR 52.63(b)(1) allows the licensee who references a design certification rule to request NRC approval for an exemption from one or more elements of the certification information. The Commission may only grant such a request if it determines that the exemption will comply with the requirements of 10 CFR 52.7, which, in turn, points to the requirements listed in 10 CFR 50.12 for specific exemptions. In addition to the factors listed in 10 CFR 52.7, the Commission shall consider whether the special circumstances outweigh any decrease in safety that may result from the reduction in standardization caused by the exemption. Therefore, any exemption from the Tier 1 information certified by Appendix D to 10 CFR Part 52 must meet the requirements of 10 CFR 50.12, 52.7, and 52.63(b)(1).

10 CFR 52.98(f) requires NRC approval for any modification to, addition to, or deletion from the terms and conditions of a COL, including any modification to, addition to, or deletion from the ITAAC contained in the license. Therefore, the proposed changes require a license amendment and NRC approval is required prior to making the plant-specific proposed changes in this LAR.

¹ While SNC describes the requested exemption as being from Section III.B of 10 CFR Part 52, Appendix D, the entirety of the exemption pertains to proposed departures from Tier 1 information in the plant-specific design control document (PS-DCD). In the remainder of this evaluation, the NRC will refer to the exemption as an exemption from Tier 1 information to match the language of Section VIII.A.4 of 10 CFR Part 52, Appendix D, which specifically governs the granting of exemptions from Tier 1 information.

The proposed changes to COL Appendix C, and updates to the associated UFSAR information (which includes the plant-specific DCD Tier 2 information) potentially effects the reference design findings for the following 10 CFR 50, Appendix A, General Design Criterion (GDC):

GDC 34, "Residual heat removal." A system to remove residual heat shall be provided. The system safety function shall be to transfer fission product decay heat and other residual heat from the reactor core at a rate such that specified acceptable fuel design limits and the design conditions of the reactor coolant pressure boundary are not exceeded.

GDC 35, "Emergency core cooling." A system to provide abundant emergency core cooling shall be provided. The system safety function shall be to transfer heat from the reactor core following any loss of reactor coolant at a rate such that (1) fuel and clad damage that could interfere with continued effective core cooling is prevented and (2) clad metal-water reaction is limited to negligible amounts.

3.0 TECHNICAL EVALUATION

3.1 TECHNICAL EVALUATION OF THE REQUESTED CHANGES

Section 2 of Enclosure 1 to LAR 18-022 provides proposed changes to revise the COL to add vent lines to the piping between the PXS collection boxes and IRWST to remove entrained air and improve the drain line flow rates. The UFSAR Figure 6.3-1 Sheet 2 is modified to add the vents to the figure. The proposed change involves the plant-specific Tier 1 information and the corresponding COL Appendix C, ITAAC Information to revise Table 2.2.3-2 to add the vent lines to the listed IRWST gutter drain lines.

The AP1000 PXS, described in detail in UFSAR Section 6.3, is designed to provide the core cooling function and thereby satisfy the requirements associated with GDCs 34 and 35 for a set of accident scenarios where the RCS remains at relatively high pressure and temperatures (e.g. transients without a substantial loss of RCS integrity). The passive residual heat removal heat exchanger accomplishes this function by providing a heat transfer path from the RCS to the IRWST. During the course of a transient of this type, the IRWST heats up and eventually reaches saturation and begins steaming to the containment, where it eventually condenses. To support continued core cooling, a safety-related gutter system lines the containment shell to recover some of this condensation and replenish the IRWST inventory.

As part of a previous LAR, see VEGP Units 3 and 4, "Request for License Amendment and Exemption Regarding Passive Core Cooling System (PXS) Condensate Return" (LAR 16-026), dated November 4, 2016 (ADAMS Accession No. ML16319A120), the NRC staff reviewed this system in detail, including a quantification of the expected condensate return rate to the IRWST and changes required to improve that return rate. LAR 18-022 proposes to further change the system based on lessons learned from testing conducted at another AP1000 plant. While the testing met the minimum requirements in the safety analysis, the flow rates were lower than expected. SNC proposes to add a set of vents to the gutter drains in order to reduce head losses in the gutter system while flow through them is occurring.

SNC states the change does not have any impact on the safety evaluation for the LAR 16-026, and the PXS continues to perform its safety functions as specified in the UFSAR. The staff reviewed the previous evaluation, and determined that the calculated condensate return flow rates in the analysis represent a conservative minimum value. The staff agrees with the licensee's assertion that adding vents to the system does not impact the previous analysis

conclusions, in which vents in the gutter system were not considered. Any further flow margin provided by the vents, which is not quantified in the LAR and the licensee does not propose to credit, will have a beneficial impact on the PXS and will not adversely affect a plant structure, system, component. Therefore, the staff finds the proposed gutter vent additions and associated changes to UFSAR Figure 6.3-1, Sheet 2 and COL Appendix C plant-specific Tier 1 Table 2.2.3-2 acceptable, as the PXS continues to satisfy the requirements associated with GDCs 34 and 35.

3.2 EVALUATION OF EXEMPTION

The regulations in Section III.B of Appendix D to 10 CFR Part 52 require a holder of a COL referencing Appendix D to 10 CFR Part 52 to incorporate by reference and comply with the requirements of Appendix D, including certified information in Tier 1 of the generic AP1000 DCD. Exemptions from Tier 1 information are governed by the change process in Section VIII.A.4 of Appendix D of 10 CFR Part 52. Because SNC has identified changes to plant-specific Tier 1 information, with corresponding changes to the associated COL Appendix C information resulting in the need for a departure, an exemption from the certified design information within plant-specific Tier 1 material is required to implement the LAR.

The Tier 1 information for which a plant-specific departure and exemption was requested relates to changes to the PXS and the IRWST as described in the licensing basis documents, and plant-specific Tier 1 Section 2.2.3. The result of this exemption would be that SNC could implement the requested modifications to Tier 1 information, with corresponding changes to COL Appendix C. Pursuant to the provisions of 10 CFR 52.63(b)(1), an exemption from elements of the design as certified in the 10 CFR Part 52, Appendix D, design certification rule is requested for the involved Tier 1 information described and justified in LAR 18-022. This exemption is a permanent exemption limited in scope to the particular Tier 1 information specified.

As stated in Section VIII.A.4 of Appendix D to 10 CFR Part 52, an exemption from Tier 1 information is governed by the requirements of 10 CFR 52.63(b)(1) and 52.98(f). Additionally, Section VIII.A.4 of Appendix D to 10 CFR Part 52 provides that the Commission will deny a request for an exemption from Tier 1 if it finds that the requested change will result in a significant decrease in the level of safety otherwise provided by the design. Pursuant to 10 CFR 52.63(b)(1), the Commission may grant exemptions from one or more elements of the certification information, so long as the criteria given in 10 CFR 52.7, which, in turn, references 10 CFR 50.12, are met and that the special circumstances, which are defined by 10 CFR 50.12(a)(2), outweigh any potential decrease in safety due to reduced standardization.

Pursuant to 10 CFR 52.7, the Commission may, upon application by any interested person or upon its own initiative, grant exemptions from the requirements of 10 CFR Part 52. As 10 CFR 52.7 further states, the Commission's consideration will be governed by 10 CFR 50.12, "Specific exemptions," which states that an exemption may be granted when: (1) the exemptions are authorized by law, will not present an undue risk to the public health and safety, and are consistent with the common defense and security; and (2) special circumstances are present. Specifically, 10 CFR 50.12(a)(2) lists six circumstances for which an exemption may be granted. It is necessary for one of these bases to be present in order for the NRC to consider granting an exemption request. SNC stated that the requested exemption meets the special circumstances of 10 CFR 50.12(a)(2)(ii). That subparagraph defines special circumstances as when "[a]pplication of the regulation in the particular circumstances would not

serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule.” The NRC staff’s analysis of these findings is presented below.

3.2.1 AUTHORIZED BY LAW

The requested exemption would allow SNC to implement the amendment described above. This exemption is a permanent exemption limited in scope to particular Tier 1 information. Subsequent changes to Tier 1, Subsection 2.2.3 and Table 2.2.3-2 or any other Tier 1 information would be subject to the exemption process specified in Section VIII.A.4 of Appendix D to 10 CFR Part 52 and the requirements of 10 CFR 52.63(b)(1). As stated above, 10 CFR Part 52, Appendix D, Section VIII.A.4 allows the NRC to grant exemptions from one or more elements of the Tier 1 information. The NRC staff has determined that granting of SNC’s proposed exemption will not result in a violation of the Atomic Energy Act of 1954, as amended, or the Commission’s regulations. Therefore, as required by 10 CFR 50.12(a)(1), the exemption is authorized by law.

3.2.2 NO UNDUE RISK TO PUBLIC HEALTH AND SAFETY

As discussed above in the technical evaluation, the proposed changes comply with the NRC’s substantive safety regulations. Therefore, there is no undue risk to the public health and safety.

3.2.3 CONSISTENT WITH COMMON DEFENSE AND SECURITY

The proposed exemption would allow a change the PXS and the IRWST as described in the licensing basis documents, and as presented in plant-specific Tier 1 information, thereby departing from the AP1000 certified (Tier 1) design information. The change does not alter or impede the design, function, or operation of any plant structures, systems, or components associated with the facility’s physical or cyber security and, therefore, does not affect any plant equipment that is necessary to maintain a safe and secure plant status. In addition, the changes have no impact on plant security or safeguards. Therefore, as required by 10 CFR 52.7 and 10 CFR 50.12(a)(1), the NRC staff finds that the common defense and security is not impacted by this exemption.

3.2.4 SPECIAL CIRCUMSTANCES

Special circumstances, in accordance with 10 CFR 50.12(a)(2), are present, in part, whenever application of the regulation in the particular circumstances would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule. The underlying purpose of the Tier 1 information is to ensure that a licensee will safely construct and operate the plant based on the certified information found in the AP1000 DCD, which was incorporated by reference into the VEGP Units 3 and 4 licensing basis. The proposed changes described in the above technical evaluation do not impact the ability of any structures, systems, and components to perform their functions or negatively impact safety.

Special circumstances are present in the particular circumstances discussed in LAR 18-022 because the application of the specified Tier 1 information is not necessary to achieve the underlying purpose of the rule. The proposed exemption would revise the ITAAC supporting the Tier 1 table related to the proposed changes of the addition of vent lines to the PXS lines which drain the containment gutters to the IRWST. This exemption requests revisions to Tier 1, Subsection 2.2.3 and Table 2.2.3-2 that continue to demonstrate that the applicable regulatory

requirements will be met. Therefore, for the above reasons, the NRC staff finds that the special circumstances required by 10 CFR 52.7 and 10 CFR 50.12(a)(2)(ii) for the granting of an exemption from the Tier 1 information exist.

3.2.5 SPECIAL CIRCUMSTANCES OUTWEIGH REDUCED STANDARDIZATION

This exemption would allow the implementation of changes to Tier 1 information in the plant-specific DCD and corresponding changes to Appendix C. The justification provided in LAR 18-022, the exemption request, and the associated licensing basis mark-ups demonstrate that there is a limited change from the standard information provided in the generic AP1000 DCD. The design functions of the system associated with this request will continue to be maintained because the associated revisions to the Tier 1 information support the design function of the PXS and IRWST. Consequently, the safety impact that may result from any reduction in standardization is minimized, because the proposed design change does not result in a reduction in the level of safety. Based on the foregoing reasons, as required by 10 CFR Part 52.63(b)(1), the staff finds that the special circumstances outweigh any decrease in safety that may result from the reduction of standardization of the AP1000 design.

3.2.6 NO SIGNIFICANT REDUCTION IN SAFETY

This exemption would allow the implementation of changes discussed above. The exemption request proposes to depart from the certified design by allowing changes discussed above in the technical evaluation. The proposed changes will not adversely affect safety-related equipment or a fission product barrier, and do not impact the functional capabilities of the PXS and IRWST to perform its design functions, and the level of safety provided by the current systems and equipment therein is unchanged. Therefore, based on the foregoing reasons and as required by 10 CFR 52.7, 10 CFR 52.98(f), and 10 CFR Part 52, Appendix D, Section VIII.A.4, the staff finds that granting the exemption would not result in a significant decrease in the level of safety otherwise provided by the design.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations in 10 CFR 50.91(b)(2), the Georgia State official was notified of the proposed issuance of the amendment on December 4, 2018. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding (*Federal Register*, 83 FR 50691, dated October 9, 2018). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

Because the exemption is necessary to allow the changes proposed in the license amendment, and because the exemption does not authorize any activities other than those proposed in the license amendment, the environmental consideration for the exemption is identical to that of the license amendment. Accordingly, the exemption meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment needs to be prepared in connection with the issuance of the exemption.

6.0 CONCLUSION

The staff has determined that pursuant to Section VIII.A.4 of Appendix D to 10 CFR Part 52, the exemption (1) is authorized by law, (2) presents no undue risk to the public health and safety, (3) is consistent with the common defense and security, (4) is a special circumstance that outweighs the reduction in standardization, and (5) does not significantly reduce the level of safety at SNC's facility. Therefore, the NRC staff grants SNC an exemption from Tier 1 information specified by SNC.

The Commission has concluded, based on the considerations discussed in Section 3.1 and the NRC staff's confirmation that the changes proposed in this LAR do not change an analysis methodology, or assumptions that there is reasonable assurance that: (1) the health and safety of the public will not be endangered by operation in the proposed manner, (2) there is reasonable assurance that such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public. Therefore, the NRC staff finds the changes proposed in this license amendment acceptable.

7.0 REFERENCES

1. Vogtle Electric Generating Plant Units 3 and 4, Request for License Amendment (LAR-18-022): Passive Core Cooling System (PXS) Gutter Drain Line Vents, August 27, 2018 (ADAMS Accession No. ML18239A375).
2. Vogtle Units 3 and 4 Updated Final Safety Analysis Report, Revision 6 and Tier 1, Revision 4, June 15, 2017 (ADAMS Accession No. ML17172A218).
3. Vogtle Electric Generating Plant Units 3 and 4, Request for License Amendment and Exemption Regarding Passive Core Cooling System (PXS) Condensate Return (LAR 16-026), November 4, 2016 (ADAMS Accession No. ML16319A120, LAR Issuance Package ML17024A317).
4. Combined License NPF-91 for Vogtle Electric Generating Plant Unit 3, Southern Nuclear Operating Company (ADAMS Accession No. ML14100A106).
5. Combined License NPF-92 for Vogtle Electric Generating Plant Unit 4, Southern Nuclear Operating Company (ADAMS Accession No. ML14100A135).
6. AP1000 Design Control Document, Revision 19, June 13, 2011 (ADAMS Accession No. ML11171A500).