



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

SAFETY EVALUATION BY THE OFFICE OF NEW REACTORS
RELATED TO AMENDMENT NOS. 109 AND 108
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 September 22, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17265A787), as supplemented by letter dated January 19, 2018 (ADAMS Accession No. ML18019A880), Southern Nuclear Operating Company, Inc. (SNC) requested that the U.S. Nuclear Regulatory Commission (NRC) amend Vogtle Electric Generating Plant (VEGP) Units 3 and 4, Combined License (COL) Nos. NPF-91 and NPF-92, respectively. In License Amendment Request (LAR) 17-035, SNC requested permission to depart from approved AP1000 Design Control Document (DCD) Tier 2 and Tier 2* information, as incorporated into the Updated Final Safety Analysis Report (UFSAR) as plant-specific DCD information. Specifically, SNC requested changes to the UFSAR to modify the licensing requirements for the American Society of Mechanical Engineers (ASME) Class 1 piping component analysis from limited to design by rule evaluations described in ASME Section III, NB-3600 to include the ability to perform design by analysis evaluations, as described in ASME Section III, NB-3200.

The supplement dated January 19, 2018, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change

the NRC staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on October 24, 2017 (82 FR 49241).

2.0 REGULATORY EVALUATION

The changes to the UFSAR proposed in LAR 17-035 modify the licensing requirements for the American Society of Mechanical Engineers (ASME) Class 1 piping component analysis from limited to design by rule evaluations described in ASME Section III, NB-3600 to include the ability to perform design by analysis evaluations, as described in ASME Section III, NB-3200. The NRC staff considered the following regulatory requirements in reviewing the LAR that included the proposed changes.

10 CFR Part 52, Appendix D, 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 Part 52, Appendix D, VIII.B.6 requires prior NRC approval for the departure from Tier 2* information. The change makes Tier 2* changes to the UFSAR Chapter 3 material. The proposed activities add ASME Code, Section III, NB-3200 to the description of the piping component analysis methods for Class 1 piping, which includes a Tier 2* departure and thus requires NRC approval. Therefore, an LAR is required.

10 CFR 52.98(f) requires NRC approval for any modification to, addition to, or deletion from the terms and conditions of a COL.

10 CFR 50.55a, (iii) "Section III condition" states that applicants or licensees may use Subarticles NB-3200, NB-3600, NC-3600, and ND-3600 for seismic design of piping, up to and including the 1993 Addenda, subject to the condition specified in paragraph (b)(1)(ii) of this section.

10 CFR Part 50, Appendix A, General Design Criterion (GDC) 1, "Quality standards and records," and 10 CFR 50.55a, "Codes and standards," require that systems and components be designed, fabricated, erected, constructed, tested, and inspected to quality standards commensurate with the importance of the safety function to be performed. Regulations in 10 CFR 50.55a also incorporate by reference the applicable editions and addenda of the ASME Boiler and Pressure Vessel Code (BPV Code), which addresses pressure integrity of components. Application of 10 CFR 50.55a and GDC 1 provides assurance that established standard practices of proven or demonstrated effectiveness are used to achieve a high likelihood that these safety functions will be performed and that the codes and standards applied are commensurate with the importance to safety of these functions.

GDC 4, "Environmental and dynamic effects design basis," requires that structures, systems, and components (SSCs) important to safety shall be designed to accommodate the effects of and to be compatible with the environmental conditions associated with normal operation, maintenance, testing, and postulated accidents, including loss-of-coolant accidents. These SSCs shall be appropriately protected against the dynamic effects, including the effects of

missiles, pipe whipping, and discharging fluids, that may result from equipment failures and from events and conditions outside the nuclear power unit.

3.0 TECHNICAL EVALUATION

3.1 PROPOSED CHANGES

SNC proposed the following UFSAR changes:

- Tier 2* Table 3.9-6 title and notes are revised to add Note 9:

“9. When the simplified requirements of ASME Section III, NB-3640 and NB-3650 are not satisfied, the more detailed methods of NB-3200 may be used as stated in NB-3630.”
- Tier 2* Table 3.9-9, “Piping” column and notes are revised to add Note i:

“i. When the simplified requirements of ASME Section III, NB-3640 and NB-3650 are not satisfied, the more detailed methods of NB-3200 may be used as stated in NB-3630.”
- Tier 2* Table 3.9-11, Note 2 is revised to add:

“When the simplified requirements of ASME Section III, NB-3640 and NB-3650 are not satisfied, the more detailed methods of NB-3200 may be used to calculate stress. The allowable listed above shall be met.”
- Tier 2 Section 3C.5 is revised to add:

“When the simplified requirements of ASME Section III, NB-3640 and NB-3650 are not satisfied, the more detailed methods of NB-3200 may be used as stated in NB-3630.”
- Tier 2* Subsection 5.2.1.1, paragraph 5 is revised to add “NB-3630” to the list of ASME Code, Section III, Subarticles that the piping stress analysis will satisfy.

3.2 TECHNICAL EVALUATION OF PROPOSED CHANGES

To perform the technical review of the proposed changes, the NRC staff considered sections of the VEGP Units 3 and 4 UFSAR, as well as portions of the AP1000 DCD, Revision 19, NUREG-1793 “Final Safety Evaluation Report Related to Certification of the AP1000 Standard Design (NUREG-1793)” and its Supplements, and the Final Safety Evaluation Report for the VEGP Units 3 and 4 COL Application, documenting the staff’s technical evaluation of those aspects of the AP1000 DCD and VEGP Units 3 and 4 COL application, respectively. The staff reviewed SNC’s proposed changes to evaluate the impact on the overall safety of the plant. The following paragraphs describe the staff’s review.

UFSAR Section 5.2.1.1 states that “the edition and addenda of the ASME Code applied in the design and manufacture of each component are the edition and addenda established by the requirements of the Design Certification. The use of editions and addenda issued subsequent

to the Design Certification is permitted or required based on the provisions in the Design Certification. The baseline used for the evaluations done to support this safety analysis report and the Design Certification is the 1998 Edition, 2000 Addenda, with an additional restriction for piping design. The restriction on piping design is that the treatment of dynamic loads, including seismic loads, in pipe stress analysis will satisfy the requirements of the ASME Code, Section III, Subarticles NB-3210, NB 3220, NB-3620, NB-3650, NC-3620, NC-3650, ND-3620, and ND-3650 1989 Edition, 1989 Addenda.”

10 CFR 50.55a, (iii) “Section III condition” states that applicants or licensees may use Subarticles NB-3200, NB-3600, NC-3600, and ND-3600 for seismic design of piping, up to and including the 1993 Addenda, subject to the condition specified in paragraph (b)(1)(ii) of this section. Applicants or licensees may not use these subarticles for seismic design of piping in the 1994 Addenda through the 2005 Addenda incorporated by reference in paragraph (a)(1) of this section, except that Subarticle NB-3200 in the 2004 Edition through the 2008 Addenda may be used by applicants and licensees, subject to the condition in paragraph (b)(1)(iii)(A) of this section. Applicants or licensees may use Subarticles NB-3600, NC-3600, and ND-3600 for the seismic design of piping in the 2006 Addenda through the 2008 Addenda, subject to the conditions of this paragraph corresponding to those subarticles.

10 CFR 50.55a paragraph (b)(1)(iii)(A) “Seismic design of piping: First provision” requires that when applying Note (1) of Figure NB-3222-1 for Level B service limits, the calculation of Pb stresses must include reversing dynamic loads (including inertia earthquake effects) if evaluation of these loads is required by NB-3223(b).

The AP1000 piping design and Design Certification use the ASME Section III 1998 Edition, 2000 Addenda. The staff noticed that there is the restriction for the use of ASME Section III, Code Editions for the AP1000 seismic piping design, as stated in 10 CFR 50.55a, paragraph (b)(1)(iii)(A). Therefore, in Request for Additional Information Transmittal for Vogtle Electric Generating Plant Units 3 and 4, Use of ASME NB-3200 for Piping Component Analysis (LAR-17-035), January 19, 2018 (ADAMS Accession No. ML18019A277), the staff requested SNC to discuss whether the ASME Section III Subarticle NB-3200 in the 2004 Edition through the 2008 Addenda will be used, and that the condition 10 CFR 50.55a paragraph (b)(1)(iii)(A) of this section is applied.

In the supplemental information provided on January 19, 2018, SNC stated that the NRC condition in 10 CFR 50.55a paragraph (b)(1)(iii)(A) for seismic design of piping is addressed by utilizing the 1989 Edition, 1989 Addenda of ASME Code, Section III for dynamic loads. As noted in UFSAR Subsection 5.2.1.1, “...the treatment of dynamic loads, including seismic loads, in pipe stress analysis will satisfy the requirements of the ASME Code, Section III, Subarticles NB-3210, NB-3220, NB-3620, NB-3650, NC-3620, NC-3650, ND-3620, and ND-3650 1989 Edition, 1989 Addenda...” Approval is not requested for alternate treatment of dynamic loads, as SNC will continue to utilize the 1989 Edition, 1989 Addenda of ASME Code, Section III for treatment of dynamic loads. The staff finds SNC’s response acceptable, since SNC uses the 1989 Edition of the ASME Code, Section III which is in accordance with the requirements of 10 CFR 50.55a(b) and the associated modifications in 10 CFR 50.55a(b)(1)(iii).

The existing licensing basis, UFSAR Subsections 3.9.3, 3C.5, and 5.2.1.1 provide Tier 2* information for the analysis of AP1000 piping design that, in order to perform the piping analysis, ASME Section III, Subsection NB-3640 and NB-3650 requirements shall be satisfied.

SNC proposed to use ASME Section III, Subsection NB-3200 "Design by Analysis" requirements for Class 1 piping stress and functional analysis methods. Because SNC will continue to use ASME Code editions that are approved in 10 CFR 50.55a, including meeting the conditions applied under 10 CFR 50.55a(b) to the specific ASME Code editions, quality standards for the design, fabrication, erection, and testing of SSCs commensurate with the importance of the function they perform will continue to be used. Therefore, the staff finds that GDC 1 will continue to be met.

Additionally, SNC will continue to use ASME Code editions that the NRC has accepted to design the SSCs to accommodate the effects of and to be compatible with the environmental conditions associated with normal operation, maintenance, testing, and postulated accidents, including loss-of-coolant accidents. Therefore, the staff finds that GDC 4 will continue to be met. The staff evaluates the changes of Tier 2* information in the following:

1. Tier 2* Table 3.9-6 title and notes are revised to add Note 9:

"9. When the simplified requirements of ASME Section III, NB-3640 and NB-3650 are not satisfied, the more detailed methods of NB-3200 may be used as stated in NB-3630."

The staff finds that the use of ASME Section III, NB-3600 including ASME Section III, NB-3200 does not adversely impact the ability to meet GDC 1 and 4. The more detailed methods of NB-3200 are acceptable to be used for Class 1 piping stress and functional analysis. Therefore, the staff finds this proposed change of Tier 2* information acceptable.

2. Tier 2* Table 3.9-9, "Piping" column and notes are revised to add Note i:

"i. When the simplified requirements of ASME Section III, NB-3640 and NB-3650 are not satisfied, the more detailed methods of NB-3200 may be used as stated in NB-3630."

The staff finds that the use of ASME Section III, NB-3600 including ASME Section III, NB-3200 does not adversely impact the ability to meet GDC 1 and 4. The more detailed methods of NB-3200 are acceptable to be used for Class 1 piping stress and functional analysis. Therefore, the staff finds this proposed change of Tier 2* information acceptable.

3. Tier 2* Table 3.9-11, Note 2 is revised to add:

"When the simplified requirements of ASME Section III, NB-3640 and NB-3650 are not satisfied, the more detailed methods of NB-3200 may be used to calculate stress. The allowable listed above shall be met."

The staff finds that the use of ASME Section III, NB-3600 including ASME Section III, NB-3200 does not adversely impact the ability to meet GDC 1 and 4. The more detailed methods of NB-3200 are acceptable to be used for Class 1 piping stress and functional analysis. Therefore, the staff finds this proposed change of Tier 2* information acceptable.

4. Tier 2* Section 3C.5 is revised to add:

“When the simplified requirements of ASME Section III, NB-3640 and NB-3650 are not satisfied, the more detailed methods of NB-3200 may be used as stated in NB-3630.”

The staff finds that the use of ASME Section III, NB-3600 including ASME Section III, NB-3200 does not adversely impact the ability to meet GDC 1 and 4. The more detailed methods of NB-3200 are acceptable to be used for Class 1 piping stress and functional analysis. Therefore, the staff finds this proposed change of Tier 2* information acceptable.

5. Tier 2* Subsection 5.2.1.1, paragraph 5 is revised to add “NB-3630” to the list of ASME Code, Section III, Subarticles that the piping stress analysis will satisfy.

The staff finds that the ASME Section III, NB-3630 is included in the list of ASME Code, Section III, Subarticles acceptable, since NB-3630 correctly referenced NB-3200 methods to be used for Class 1 piping stress and functional analysis. ASME Section III, NB-3200 does not adversely impact the ability to meet GDC 1 and 4. Therefore, the staff finds this proposed change of Tier 2* information acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations in 10 CFR 50.91(b)(2), on February 2, 2018, the Georgia State official was consulted. 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, “Standards for Protection Against Radiation.” The NRC staff finds 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 (82 FR 49241, published on October 24, 2017). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Under 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

6.0 CONCLUSION

The NRC staff has reviewed SNC's analysis provided in LAR 17-035, dated September 22, 2017, as supplemented by letter dated January 19, 2018, and finds that:

- (1) The proposed changes do not adversely affect the existing safety standard.
- (2) The proposed changes provide additional clarity to existing DCD Tier 2* information.

Based on these findings, the staff concludes that there is reasonable assurance that the requirements of GDC 1, GDC 4; 10 CFR 50.55a, and Appendix D to 10 CFR Part 52 continue to

be met with the changes described in LAR 17-035. Therefore, there is reasonable assurance that: (1) the health and safety of the public will not be endangered by construction and 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 staff finds the proposed changes provided in LAR 17-035 to be acceptable.

7.0 REFERENCES

1. Vogtle Electric Generating Plant Units 3 and 4 – Request for License Amendment RE: Use of ASME NB-3200 for Piping Component Analysis (LAR-17-035), September 22, 2017 (ADAMS Accession No. ML17265A787).
2. Vogtle Units 3 and 4 Updated Final Safety Analysis Report, Revision 6 and Tier 1, Revision 5 dated March 12, 2017 (ADAMS Accession No. ML17172A218).
3. AP1000 Design Control Document, Revision 19, June 13, 2011 (ADAMS Accession No. ML11171A500).
4. NUREG-2124, Volume 1, "Final Safety Evaluation Report Related to the Combined Licenses for Vogtle Electric Generating Plant, Units 3 and 4," September 30, 2012 (ADAMS Accession No. ML12271A045).
5. NUREG-1793, Volume 1, "Final Safety Evaluation Report Related to Certification of the AP1000 Standard Plant Design," September, 2004 (ADAMS Accession No. ML043450344).
6. NUREG-1793, Supplement 1, "Final Safety Evaluation Report Related to Certification of the AP1000 Standard Plant Design," dated December 31, 2005 (ADAMS Accession No. ML060330557).
7. NUREG-1793, Volume 1, Supplement 2, "Final Safety Evaluation Report Related to Certification of the AP1000 Standard Plant Design," dated August 5, 2011 (ADAMS Accession No. ML11293A120).
8. Summary of Public Meeting with SNC on January 18, 2018 (ADAMS Accession No. ML18023A251).
9. Request for Additional Information Transmittal for Vogtle Electric Generating Plant Units 3 and 4, Use of ASME NB-3200 for Piping Component Analysis (LAR-17-035), January 19, 2018 (ADAMS Accession No. ML18019A277).
10. Southern Nuclear Operating Company Letter ND-18-0071, Vogtle Electric Generating Plant Units 3 and 4 Supplement to Request for License Amendment Regarding: Use of ASME NB-3200 for Piping Component Analysis (LAR-17-035S1), January 19, 2018 (ADAMS Accession No. ML18019A880).