



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

SAFETY EVALUATION BY THE OFFICE OF NEW REACTORS

RELATED TO REQUEST FOR VEGP 3&4-PSI/ISI-ALT-10

REGARDING REQUEST FOR ALTERNATIVE:

ALTERNATIVE REQUIREMENTS FOR PRESERVICE EXAMINATION VOLUMETRIC

SURFACE CONFIGURATION REQUIREMENTS

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 July 26, 2018, as revised by letter dated August 30, 2018 (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML18207A736 and ML18242A431), Southern Nuclear Operating Company, Inc. (SNC), requested U.S. Nuclear Regulatory Commission (NRC) approval of an alternative, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(z), to the requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section III, Subsubparagraph NB-4424.2(a) for the preservice inspection at Vogtle Electric Generating Plant (VEGP) Units 3 and 4. The proposed alternative would allow SNC to use alternative surface configurations that will not meet the surface finish distance requirements in ASME Code, Section III, Subsubparagraph NB-4424.2(a) and Figures NB-4250-2 and NB-4250-3 for ASME Code Class 1 piping and component welds subject to preservice ultrasonic examination.

2.0 REGULATORY EVALUATION

The regulations in 10 CFR 50.55a(c)(1) require components that are part of the reactor coolant pressure boundary to meet the requirements for Class 1 components in Section III of the ASME Code, except as provided in paragraphs (c)(2) through (4) of 10 CFR 50.55a.

Section 50.55a(g)(2)(i) of 10 CFR requires that components (including supports) that are classified as ASME Code Class 1 must be designed and be provided with the access necessary to perform the required preservice and inservice examinations set forth in the editions and addenda of Section III or Section XI of the ASME Code incorporated by reference in paragraph (a)(1) of 10 CFR 50.55a.

Section 50.55a(g)(3)(ii) of 10 CFR requires that ASME Code Class 1 components (including their supports) in nuclear power facilities whose construction permits were issued after 1974 meet the preservice examination requirements set forth in either the edition and addenda of Section III or Section XI of the ASME Code that was applied to the construction of the component, or in subsequent editions and addenda that have been incorporated by reference into 10 CFR 50.55a.

Per 10 CFR 50.55a(z), alternatives to the requirements of paragraphs (b) through (h) of 10 CFR 50.55a or portions thereof may be used when authorized by the Director, Office of New Reactors. In proposing alternatives, the licensee must demonstrate that: (1) the proposed alternative would provide an acceptable level of quality and safety; or (2) compliance would result in hardship or unusual difficulty without a compensating increase in quality and safety.

3.0 TECHNICAL EVALUATION

3.1 SNC's Alternative

The components affected by this request are ASME Code Class 1 piping and component welds subject to preservice ultrasonic examination at VEGP Units 3 and 4 where the surface finish distance requirements in ASME Code, Section III, Subsubparagraph NB-4424.2(a) and Figures NB-4250-2 and NB-4250-3 cannot be met due to interferences within the required surface finish distance.

The ASME Code of Record for the construction of VEGP Units 3 and 4 is the 1998 Edition, including the 2000 Addenda, of ASME Code, Section III. The applicable ASME Code, Section III requirements are as follows.

ASME Code, Section III, Subsubparagraph NB-4424.2(a) states that:

The surface finish shall be 6.3 Ra or better for a distance of at least $2t$ [where t equals the nominal wall thickness] plus 4 in. or 6 in., whichever is greater (Fig. NB-4250-2 or Fig. NB-4250-3), from the edge of the weld crown on at least one side of the weld where an ultrasonic examination is required.

ASME Code, Section III, Figures NB-4250-2 and NB-4250-3 illustrate that the surface finish distance of $2t$ plus 4 in. or 6 in., whichever is greater, in ASME Code, Section III, Subsubparagraph NB-4424.2(a) is required to be free of interferences (e.g., hanger, attachment, etc.).

ASME Code, Section III, Subsubarticle NCA-3360, "Certification of the Construction Specification, Design Drawings, and Design Report," states that:

(a) The Construction Specification, Design Drawings, and Design Report shall be reviewed and certified to be correct and in accordance with the Design Specification and this Section by one or more Registered Professional Engineers competent in the field of design of concrete components and qualified in accordance with the requirements of Appendix XXIII of Section III Appendices. These Registered Professional Engineers are not required to be independent of the organization designing the component. Distribution of Construction Specification, Design Drawings, and the Design Report is shown in Table NCA-3200-1.

(b) In order for the Designer to certify the Construction Specification and Design Drawings, it is necessary that the Design Specification has been certified. For the Constructor or Fabricator to do work in accordance with Construction Specifications and Design Drawings, it is necessary that these documents have been certified.

ASME Code, Section III, Subsubarticle NCA-3370, "Revision of Design Drawings and Construction Specification," states that:

Design Documents issued for use in construction shall be revised to reflect any change in the Design. Changes to Design Documents shall be reviewed and certified in accordance with NCA-3360.

SNC proposed to use alternative surface configurations that will not meet the surface finish distance requirements in ASME Code, Section III, Subsubparagraph NB-4424.2(a) and Figures NB-4250-2 and NB-4250-3 for ASME Code Class 1 piping and component welds subject to preservice ultrasonic examination. Specifically, the proposed alternative would apply in instances where there is less distance than the required surface finish distance of $2t$ plus 4 in. or 6 in., whichever is greater, due to interferences within the required surface finish distance. SNC stated that they requested the proposed alternative because there are instances at VEGP Units 3 and 4 where they cannot meet the surface finish distance requirement due to the presence of interferences within the required surface finish distance. SNC noted a VEGP Units 3 and 4 specific example where instrumentation bosses near the steam generator hot leg safe end-to-pipe welds are within the required surface finish distance. SNC provided, for the VEGP Units 3 and 4 specific example, a figure showing that the required examination volume may be achieved by positioning the ultrasonic examination probe within shorter distances than the surface finish distance requirements in ASME Code, Section III, Subsubparagraph NB-4424.2(a) and Figures NB-4250-2 and NB-4250-3. SNC stated that the required surface finish of 6.3 Ra or better in ASME Code, Section III, Subsubparagraph NB-4424.2(a) will continue to be met up to the interference within the required surface finish distance. Therefore, SNC is not requesting approval for alternative surface finishes.

SNC stated that, in instances where there is less distance than the required surface finish distance of $2t$ plus 4 in. or 6 in., whichever is greater, an inspectability evaluation will be conducted to ensure adequate examinations can be performed. An inspectability report will document the percent coverage that can be obtained and will conclude that essentially 100 percent of the ASME Code, Section XI inspection volume can be obtained. SNC further stated that if essentially 100 percent of the ASME Code, Section XI inspection volume cannot be

examined with an alternative surface configuration, then the proposed alternative will not apply. SNC also stated that the Certificate Holder shall (with agreement of the Owner or Owner Designee) verify and document that the required preservice inspection can be performed within the distance to the interference.

SNC stated that alternative surface configurations will meet ASME Code, Section III, Figure NB-4250-1. SNC stated that a description of the allowed distance to the interference will be documented in the Owner's Design Specification. SNC further stated that use of alternative surface configurations will be documented in the applicable VEGP Units 3 and 4 Design Specifications and N-5 Data Reports.

SNC stated that the purpose of the surface finish distance requirements in ASME Code, Section III, Subsubparagraph NB-4424.2(a) and Figures NB-4250-2 and NB-4250-3 is to ensure the examination area is adequate to perform a volumetric examination of component and pipe welds from the outside diameter. SNC asserted that there are other examination configurations that would allow an adequate examination in accordance with ASME Code, Section XI. SNC stated that the proposed alternative provides an acceptable level of quality and safety in accordance with 10 CFR 50.55a(z)(1) because it ensures essentially 100 percent of the ASME Code, Section XI preservice inspection volume can be examined and future inservice inspection coverage requirements will be met.

3.2 NRC Staff Evaluation

Section 50.55a of 10 CFR requires that components of nuclear power plants meet the requirements of the ASME Code, except where alternatives have been authorized by the Director, Office of New Reactors, pursuant to 10 CFR 50.55a(z). Pursuant to 10 CFR 50.55a(z)(1), SNC requested approval to use alternative surface configurations that will not meet the surface finish distance requirements in ASME Code, Section III, Subsubparagraph NB-4424.2(a) and Figures NB-4250-2 and NB-4250-3 for ASME Code Class 1 piping and component welds subject to preservice ultrasonic examination. SNC is not requesting alternative surface finishes, therefore, the required surface finish of 6.3 Ra or better in ASME Code, Section III, Subsubparagraph NB-4424.2(a) will continue to be met up to the interference.

Staff finds SNC's proposal to use alternative surface configurations acceptable because the preservice examinations specified in the ASME Code, and required by 10 CFR 50.55a, will continue to be performed on essentially 100 percent of the required examination volume. Staff notes that ASME Code, Section XI, Subarticle IWA-2200, "Examination Methods," is still applicable and states that: "Essentially 100 percent coverage is achieved when the applicable examination coverage is greater than 90 percent; however, in no case shall the examination be terminated when greater than 90 percent coverage is achieved, if additional coverage of the required examination surface or volume is practical."

Staff finds it acceptable that alternative surface configurations will meet the requirements in ASME Code, Section III, Figure NB-4250-1 because ASME Code, Section III, Subsubarticle NB-4250 states that any weld end transition which lies entirely within the envelope shown in Figure NB-4250-1 is acceptable provided that Subsubparagraphs NB-4250(a), (b), and (c) are met. SNC's alternative request does not propose an alternative to ASME Code, Section III, Subsubparagraphs NB-4250(a), (b), or (c) therefore, alternative surface configurations are required to meet Subsubparagraphs NB-4250(a), (b), or (c) in ASME Code, Section III.

In addition, staff finds that alternative surface configurations will be documented appropriately in the applicable VEGP Units 3 and 4 Design Specifications and N-5 Data Reports because ASME Code, Section III, Subsubarticle NCA-3370 requires that changes to design documents issued for use in construction be reviewed and certified in accordance with ASME Code, Section III, Subsubarticle NCA-3360.

In summary, staff reviewed the information provided and finds that SNC has demonstrated that the proposed alternative provides an acceptable level of quality and safety because the alternative surface configurations will:

1. Ensure that the required preservice volumetric examinations can be performed on essentially 100 percent of the required examination volume, which satisfies the intent for why the surface finish and surface finish distance requirements in Subsubparagraph NB-4424.2(a) and Figures NB-4250-2 and NB-4250-3 were added to the ASME Code;
2. Meet the required surface finish of 6.3 Ra or better in ASME Code, Section III, Subsubparagraph NB-4424.2(a) up to the interference;
3. Meet the configuration requirements in ASME Code, Section III, Figure NB-4250-1; and
4. Be appropriately documented in the applicable VEGP Units 3 and 4 Design Specifications and N-5 Data Reports.

4.0 CONCLUSION

As set forth above, staff determines that the proposed alternative to the requirements of the 1998 Edition, including the 2000 Addenda, of ASME Code, Section III, Subsubparagraph NB-4424.2(a) and Figures NB-4250-2 and NB-4250-3 provides an acceptable level of quality and safety. Accordingly, staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(z)(1), and is in compliance with the ASME Code requirements. Therefore, staff authorizes PSI/ISI-ALT-10 for the preservice inspection at VEGP Units 3 and 4. All other requirements of ASME Code, Sections III and XI, and 10 CFR 50.55a, for which an alternative has not been specifically requested and authorized, remain applicable.

5.0 REFERENCES

1. VEGP 3&4-PSI/ISI-ALT-10, "Request for Alternative: Alternative Requirements for Preservice Examination Volumetric Surface Configuration Requirements," dated July 26, 2018 (ADAMS Accession No. ML18207A736).
2. VEGP 3&4-PSI/ISI-ALT-10R1, "Revision to Request for Alternative: Alternative Requirements for Preservice Examination Volumetric Surface Configuration Requirements," dated August 30, 2018 (ADAMS Accession No. ML18242A431).
3. Vogtle Electric Generating Plant Units 3 and 4, Updated Final Safety Analysis Report, dated August 11, 2017 (ADAMS Accession No. ML17172A218).