



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

May 6, 2016

Mr. George A. Lippard, III
Vice President, Nuclear Operations
South Carolina Electric & Gas Company
Virgil C. Summer Nuclear Station
P.O. Box 88, Mail Code 800
Jenkinsville, SC 29065

SUBJECT: VIRGIL C. SUMMER NUCLEAR STATION, UNIT NO. 1 – RELIEF FROM THE
REQUIREMENTS OF THE ASME CODE (CAC NO. MF7085)

Dear Mr. Lippard:

By letter dated November 10, 2015, as supplemented by letter dated March 18, 2016, South Carolina Electric & Gas Company (SCE&G, the licensee) submitted Relief Request RR-III-12, to the U.S. Nuclear Regulatory Commission (NRC) for the third 10-year inservice inspection (ISI) interval of the Virgil C. Summer Nuclear Station, Unit No. 1. The licensee requested relief from the examination requirements of Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (B&PV Code) applicable to ASME Code Class 1 piping welds and ASME Code Class 2 vessel welds. The scope of this approval is for the two ASME Code Class 2 vessel welds, CGE-2-1110-1B/1 and CGE-2-1110-1B/2, in the residual heat removal heat exchanger shell. The four remaining ASME Code Class 1 piping welds submitted in the November 10, 2015, application will be addressed in separate correspondence under CAC No. MF7098.

The application was submitted pursuant to Title 10 of the *Code of Federal Regulations* 50.55a(g)(5)(iii). The licensee requested relief and to use alternative requirements (if necessary), for ISI on the basis that the B&PV Code requirement is impractical.

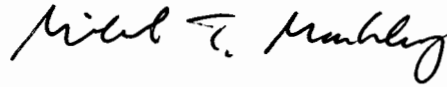
The NRC staff has reviewed the subject request and concludes, as set forth in the enclosed safety evaluation, that SCE&G has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(g)(6)(i) and, therefore, authorizes the proposed alternative for the two ASME Code Class 2 vessel welds, CGE-2-1110-1B/1 and CGE-2-1110-1B/2.

G. Lippard, III

- 2 -

If you have any questions, please contact the Project Manager, Shawn Williams, at 301-415-1009 or Shawn.Williams@nrc.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael T. Markley". The signature is fluid and cursive, with a large, stylized "M" and "K".

Michael T. Markley, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-395

Enclosure:
Safety Evaluation

cc w/encl: Distribution via Listserv



UNITED STATES
NUCLEAR REGULATORY COMMISSION
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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELIEF REQUEST RR-III-12 REGARDING ASME CODE CLASS 2 VESSEL WELDS

CGE-2-1110-1B/1 AND CGE-2-1110-1B/2

SOUTH CAROLINA ELECTRIC & GAS COMPANY

SOUTH CAROLINA PUBLIC SERVICE AUTHORITY

VIRGIL C. SUMMER NUCLEAR STATION, UNIT NO. 1

DOCKET NO. 50-395

1.0 INTRODUCTION

By letter dated November 10, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15316A556), as supplemented by letter dated March 18, 2016 (ADAMS Accession No. ML16083A214), South Carolina Electric & Gas Company (the licensee) submitted Relief Request RR-III-12 to the U.S. Nuclear Regulatory Commission (NRC) for the third 10-year inservice inspection (ISI) interval of the Virgil C. Summer Nuclear Station, Unit 1 (Summer). In Relief Request RR-III-12, the licensee requested relief from the examination requirements of Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (B&PV Code) applicable to ASME Code Class 1 piping welds and ASME Code Class 2 vessel welds. The scope of this review is for the two ASME Code Class 2 vessel welds, CGE-2-1110-1B/1 and CGE-2-1110-1B/2, in the residual heat removal (RHR) heat exchanger shell identified in the licensee's submittal. These two welds are ASME Code, Section XI, Examination Category C-A welds, Item No. C1.20.

The application was submitted pursuant to Title 10 of the *Code of Federal Regulations* 50.55a(g)(5)(iii). The licensee requested relief and to use alternative requirements (if necessary), for ISI on the basis that the B&PV Code requirement is impractical.

2.0 REGULATORY EVALUATION

The ISI of ASME Code Class 1, 2, and 3 components is performed in accordance with Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," of the B&PV Code and applicable edition and addenda, as required by 10 CFR 50.55a(g). When conformance to these requirements is determined to be impractical, relief may be granted by the NRC pursuant to 10 CFR 50.55a(g)(6)(i). Additionally, pursuant to 10 CFR 50.55a(g)(6)(i), the NRC may impose such alternative requirements, as it determines are authorized by law, that will not endanger life or property or the common defense and security, and are otherwise in the public interest, giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

Enclosure

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) shall meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI, to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that inservice examination of components and system pressure tests conducted during the first 10-year interval and subsequent intervals complies with the requirements in the latest edition and addenda of Section XI of the ASME Code, incorporated by reference in 10 CFR 50.55a(a), 12 months prior to the start of the 120-month interval, subject to the conditions in 10 CFR 50.55a(b)(2). The code of record for Summer for the third 10-year ISI interval is the 2000 Addenda to the 1998 Edition of the ASME Code, Section XI.

The regulation in 10 CFR 50.55a(g)(5)(iii) states, in part, that determinations of impracticability in accordance with this section must be based on the demonstrated limitations experienced when attempting to comply with the ASME Code requirements during the ISI interval for which the request is being submitted. Requests for relief made in accordance with this section must be submitted to the NRC no later than 12 months after the expiration of the initial or subsequent 120-month inspection interval for which relief is sought. The licensee submitted Relief Request RR-III-12 on August 10, 2015, for the third 10-year ISI interval of Summer, which ended on December 31, 2013. As indicated in the submittal, in accordance with the ASME Code, Section XI, paragraph IWA-2430(c)(1), the licensee extended the third ISI 10-year interval of Summer to end on December 31, 2014.

3.0 TECHNICAL EVALUATION

The information provided by the licensee in support of Relief Request RR-III-12 regarding welds CGE-2-1110-1B/1 and CGE-2-1110-1B/2 has been evaluated, and the bases for disposition are documented below.

ASME Code Component Identification

ASME Code Class:	ASME Code, Section XI, Class 2
Examination Category:	C-A
Item Number:	C1.20, Pressure Retaining Welds in Pressure Vessels
Component:	RHR Heat Exchanger
Weld Numbers:	CGE-2-1110-1B/1 and CGE-2-1110-1B/2

ASME Code Requirements

The applicable examination requirement for welds CGE-2-1110-1B/1 and CGE-2-1110-1B/2 is essentially 100 percent volumetric examination of the weld length, as specified in Table IWC-2500-1, "Examination Categories," of the ASME Code, Section XI, Examination Category C-A, Item No. C1.20. When 100 percent of the required volume cannot be examined due to interferences, obstructions, or geometrical configuration, ASME Code Case N-460, "Alternative Examination Coverage for Class 1 and Class 2 Welds," allows reduction of the examination volume to 90 percent of the required volume. ASME Code Case N-460 has been approved for use by the NRC in Regulatory Guide 1.147, Revision 17, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1."

Licensee's Relief Request

The licensee achieved less than 90 percent coverage of the required examination volume due to the geometric configuration and obstructions inherent in the design of the RHR heat exchanger. The licensee achieved 43.9 percent coverage of the required examination volume for weld CGE-2-1110-1B/1 due to the flange on the upstream side of the weld and the two saddle plates attached to the RHR heat exchanger shell. For weld CGE-2-1110-1B/2, the licensee achieved 87.8 percent coverage of the required examination volume due to the two saddle plates attached to the RHR heat exchanger shell. These limitations, inherent in the design of the RHR heat exchanger in the region of the subject welds, make the ASME Code-required examination coverage impractical. Plant modifications or replacement of components to allow for complete coverage would be needed to meet the ASME Code requirements.

Licensee's Proposed Alternative (as stated by the licensee)

Examination of welds/components was conducted using personnel, equipment, and procedures qualified in accordance with ASME Section XI, 1998 Edition through 2000 Addenda. Summer has examined the subject welds to the maximum extent possible utilizing approved examination techniques and equipment. Based on the limited coverage achieved by the examinations performed, it is the position of the station that the limited examinations provide a reasonable assurance of quality and safety.

NRC Staff Evaluation

The licensee achieved 43.9 percent coverage of the required examination volume for weld CGE-2-1110-1B/1 due to the flange on the upstream side of the weld and the two saddle plates attached to the RHR heat exchanger shell. Weld CGE-2-1110-1B/2 achieved 87.8 percent coverage of the required examination volume due to the two saddle plates attached to the RHR heat exchanger shell. As such, obtaining the ASME Code-required examination volumes for these two welds would require significant modification of the RHR heat exchanger shell, which imposes a burden upon the licensee.

The licensee stated that the examination was performed with ultrasonic examination procedure SCANA-UT-98-13. By NRC letter dated February 18, 2016 (ADAMS Accession No. ML16042A471), the staff requested the licensee in Request for Additional Information (RAI) No. 1 to discuss the ASME Code Section XI, Appendix I, requirement on which procedure SCANA-UT-98-13 is based. By letter dated March 18, 2016, the licensee stated that the requirement of Subarticle I-2200 of Appendix I to Section XI of the ASME Code is applicable to procedure SCANA-UT-98-13. Subarticle I-2200 of Appendix I to Section XI of the ASME Code states that ultrasonic examination of vessels not greater than 2 inches in thickness shall be performed in accordance with Appendix III to Section XI of the ASME Code, with the applicable supplements in Table I-2000-1 "Required Supplements," of Appendix I to Section XI of the ASME Code. The staff verified that the thickness of the RHR heat exchanger shell applicable to welds CGE-2-1110-1B/1 and CGE-2-1110-1B/2 is less than 2 inches. Based on the above, the NRC staff concludes the licensee's response to RAI No. 1 is acceptable.

Welds CGE-2-1110-1B/1 and CGE-2-1110-1B/2 were examined to the maximum extent possible, using 45-degree shear wave search units, scanning both parallel and perpendicular to the weld. Weld CGE-2-1110-1B/1 is limited to scanning only one side of the weld due to the flange configuration on the other side of the weld. Weld CGE-2-1110-1B/2 was scanned on both sides of the weld. The examined volumes of both welds included the weld and base material near the inside surface of the weld joint, which are regions of high stress, and where one would expect degradation to be manifested, should it occur.

During the ultrasonic examinations of welds CGE-2-1110-1B/1 and CGE-2-1110-1B/2, the licensee detected inside surface geometries that were previously recorded and verified at similar locations and similar search unit amplitudes. The staff confirmed that these inside surface geometries were recorded in the previous (second) 10-year ISI interval submittal (SCE&G letter dated September 16, 2003, ADAMS Accession No. ML032690223).

By NRC letter dated February 18, 2016, in RAI No. 2, the staff requested the licensee to discuss any plant-specific operating experience regarding potential degradation in welds CGE-2-1110-1B/1 and CGE-2-1110-1B/2. By letter dated March 18, 2016, in its response to the staff's RAI No. 2, the licensee stated that there is no plant-specific operating experience regarding potential degradation in welds CGE-2-1110-1B/1 and CGE-2-1110-1B/2. Therefore, the NRC staff concludes that the response to RAI No. 2 is acceptable. Based on the examination coverage obtained for the subject weld, if significant service-induced degradation were occurring, the NRC staff concludes there is reasonable assurance that evidence of degradation would be detected by the examination coverage achieved.

Based on the above, the NRC staff determined that obtaining the ASME Code-required examination volume is impractical because it would impose a burden upon the licensee. The staff also determined that the volumetric ultrasonic examination performed to the maximum extent possible provides reasonable assurance of the structural integrity of welds CGE-2-1110-1B/1 and CGE-2-1110-1B/2 in Relief Request RR-III-12.

4.0 CONCLUSION

As set forth above, the staff has determined that with respect to welds CGE-2-1110-1B/1 and CGE-2-1110-1B/2, granting relief pursuant to 10 CFR 50.55a(g)(6)(i) is authorized by law and will not endanger life or property, or the common defense and security, and is otherwise in the public interest, given due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility. Furthermore, the staff concludes that the licensee's examinations were performed to the maximum extent possible and that they provide reasonable assurance of the structural integrity of the subject RHR heat exchanger shell welds. Accordingly, the staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(g)(6)(i). Therefore, the staff grants relief from the ASME Code examination requirements for welds CGE-2-1110-1B/1 and CGE-2-1110-1B/2 in the RHR heat exchanger included in Relief Request RR-III-12 for the Summer third 10-year ISI interval.

All other requirements of Section XI of the ASME Code for which relief was not specifically requested and approved in the subject relief request remain applicable, including third party review by the Authorized Nuclear Inservice Inspector.

Principal Contributor: David Dijamco

Date: May 6, 2016

G. Lippard, III

- 2 -

If you have any questions, please contact the Project Manager, Shawn Williams, at 301-415-1009 or Shawn.Williams@nrc.gov.

Sincerely,

/RA/

Michael T. Markley, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-395

Enclosure:
Safety Evaluation

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***Internal Package ML16124A008**

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NAME	SWilliams	LRonewicz	JMcHale	MMarkley
DATE	5/4/16	5/4/16	5/2/16	5/6/16

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