



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

February 7, 2013

Mr. C. R. Pierce
Regulatory Affairs Director
Southern Nuclear Operating Company, Inc.
Post Office Box 1295 / Bin 038
Birmingham, AL 35201-1295

SUBJECT: VOGTLE ELECTRIC GENERATING PLANT, UNIT 1 - SAFETY EVALUATION
OF RELIEF REQUEST VEGP-ISI-ALT-08, VERSION 1.0, REGARDING
INSTALLATION OF A MECHANICAL CLAMP ON A CLASS 1 VALVE –
FOURTH 10-YEAR INTERVAL (TAC NO. ME9850)

Dear Mr. Pierce:

By letter to the U.S. Nuclear Regulatory Commission (NRC), dated October 25, 2012, as supplemented by letter dated October 29, 2012, Southern Nuclear Operating Company, Inc. (SNC, the licensee) proposed an alternative (VEGP-ISI-ALT-08, Version 1.0) to Appendix IX of Section XI of the American Society of Mechanical Engineer's Boiler and Pressure Vessel (ASME) Code to allow installation of a mechanical clamp on a non-pressure boundary leak from a Class 1 Chemical and Volume Control valve 1-1208-U4-A11 for the Vogtle Electric Generating Plant, Unit 1(VEGP-1).

On November 1, 2012, pursuant to Title 10 *Code of Federal Regulations*, Part 50, Section 50.55a(a)(3)(ii), the NRC staff verbally authorized the use of the Alternative VEGP-ISI-ALT-08, Version 1.0. This safety evaluation documents the technical basis of the verbal authorization.

The NRC staff determines that the proposed alternative provides reasonable assurance of structural integrity and leak tightness of the subject components and that complying with the specified requirement would result in a hardship or unusual difficulty without a compensating increase in the level of quality and safety. Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(a)(3)(ii), and is in compliance with requirements of the ASME Code, Section XI for which relief was not requested. Therefore, in accordance with 10 CFR 50.55a(a)(3)(ii) the NRC authorizes use of the licensee's proposed alternative, VEGP-ISI-ALT-08, Version 1.0, at VEGP-1 until the 1R18 refueling outage in the spring of 2014.

C. Pierce

- 2 -

All other requirements in ASME Code, Section XI, and 10 CFR 50.55a for which relief was not specifically requested and approved in this RR remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

Sincerely,

A handwritten signature in black ink, appearing to read "R. Pascarelli".

Robert Pascarelli, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-424

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 VEGP-ISI-ALT-08, VERSION 1.0, REGARDING INSTALLATION
OF A MECHANICAL CLAMP ON A CLASS 1 VALVE – FOURTH 10-YEAR INTERVAL
SOUTHERN NUCLEAR OPERATING COMPANY, INC.
VOGTLE ELECTRIC GENERATING PLANT, UNIT 1
DOCKET NO. 50-424

1.0 INTRODUCTION

By letter dated October 25, 2012 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12299A244), as supplemented by letter dated October 29, 2012 (ADAMS Accession No. ML12305A421), Southern Nuclear Operating Company, Inc., the licensee, proposed an alternative (VEGP-ISI-ALT-08, Version 1.0) to Appendix IX of Section XI of the American Society of Mechanical Engineer's Boiler and Pressure Vessel (ASME) Code to allow installation of a mechanical clamp on a non-pressure boundary leak from a Class 1 Chemical and Volume Control valve 1-1208-U4-A11. The licensee proposes this alternative during the current 2012 operating cycle at the Vogtle Electric Generating Plant, Unit 1 (VEGP-1).

The licensee states that the mechanical clamp will only be in place until the 1R18 refueling outage in the spring of 2014 or until an outage of sufficient duration to allow VEGP-1 to perform either a permanent repair to the affected valve or replace the valve. The licensee also provided information on the hardship involved with performing a plant shutdown and cooldown to Mode 5, which the licensee assessed as an option. Therefore the licensee requested authorization of their proposed alternative under the requirements of Title 10 of the *Code of Federal Regulations*, Part 50 (10 CFR 50) 50.55a(a)(3)(ii).

On November 1, 2012, pursuant to 10 CFR 50.55a(a)(3)(ii), the NRC staff verbally authorized the use of the Alternative VEGP-ISI-ALT-08, Version 1.0 (ADAMS Accession No. ML12307A411). This safety evaluation documents the technical basis of the verbal authorization.

2.0 REGULATORY EVALUATION

In this relief request the licensee requests authorization of an alternative to the requirements ASME Code, Section XI, Appendix IX pursuant to 10 CFR 50.55a(a)(3)(ii).

Section 50.55a(g)(4) of 10 CFR, states that ASME Code Class 1, 2, and 3 components (including supports) shall meet the requirements, except the design and access provisions and preservice examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that ISI of components and system pressure tests conducted during the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b) twelve months prior to the start of the 120-month interval, subject to the conditions listed therein.

Section 50.55a(a)(3) states, in part, that alternatives to the requirements of paragraph (g) of 10 CFR 50.55a may be used, when authorized by the NRC, if the licensee demonstrates (i) the proposed alternatives would provide an acceptable level of quality and safety or (ii) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Based on the above analysis, the staff finds that regulatory authority to authorize an alternative to the ASME Code requirement, as requested by the licensee, exists.

3.0 TECHNICAL EVALUATION

3.1 Applicable Code Edition and Addenda

The applicable ASME Code, Section XI of record for the third 10-year ISI interval at VEGP-1 is the 2001 Edition through 2003 Addenda.

3.2 Reason for Request

On October 7, 2012, while performing the VEGP-1 Class 1 leakage test during start-up from the 1R17 refueling outage, a steam leak was observed on the Kerotest valve 1-1208-U4-A11 on the 2-inch pressurizer auxiliary spray line. The steam leak emanated from a pinhole on the seal weld between the threaded connection joining the valve body and bonnet. Because the leakage was occurring at the seal weld, it was determined that the leakage was operational leakage and not reactor coolant pressure boundary leakage. SNC realized that actions would need to be taken to address the leakage. In order to stop steam from escaping through the pinhole in the seal weld a mechanical clamp with sealant was installed on October 13, 2012. Subsequently, steam leakage was re-identified on October 22, 2012. Discussions with the vendor determined that the most likely cause of the recurrence of the leakage was that the sealant had been injected at a temperature lower than that required to ensure proper curing of the material. Replacement of the clamp with a similar clamp and reinjection of the sealant is desired to prevent leakage until a permanent solution can be implemented.

3.3 Licensee's Proposed Alternative

Section XI, Appendix IX provides rules for the installation of mechanical clamps on Class 2 and 3 pressure boundary leakage. The licensee proposed to use the rules of Appendix IX as guidance for installation of a mechanical clamp on the Class 1 non-pressure boundary leakage. The replacement clamp is the same design as the original clamp except with a relocated sealant injection port. The clamp and the sealant will encapsulate the leak and will replace the seal

weld's function. In lieu of the Appendix IX, Article IX-6000 required ongoing volumetric examination to monitor adjacent piping throughout the operating cycle the licensee proposed ongoing remote video camera observations and VT-2 examinations for leakage.

3.4 NRC Staff's Evaluation

The staff evaluated the technical aspects of proposed Alternative VEGP-ISI-ALT-08, Version 1.0 against the criteria contained in 10 CFR 50.55a(3)(ii), the existence of a hardship or unusual difficulty without a compensating increase in quality or safety. The staff finds the first criterion, hardship or unusual difficulty, to be met if the licensee can demonstrate the requirement would necessitate things such as a need to enter multiple Technical Specification action statements, radiation ALARA concerns, hardware changes, or creating significant hazards to plant equipment or personnel, etc. The staff finds that the second criterion can be met if the proposed alternative provides reasonable assurance of structural integrity and leak tightness of the subject components.

Without the proposed alternative, the licensee stated that in order to stop the leakage they would need to return the plant to Mode 5. The licensee stated the activities associated with the shutdown and startup processes would cause an additional estimated radiation dose of approximately 400-500 mREM. The licensee also cited the inherent risk associated with a shutdown transient and the extra cycles of thermal and pressure stresses for plant components. The unit startup and shutdown activities also present otherwise unnecessary challenges to personnel safety. The staff finds the radiological dose and risk associated with these startup and shutdown evolutions, to be significantly larger than that expected to be associated with the installation of the mechanical clamping device to resolve the non-pressure boundary leakage concern associated with valve 1-1208-U4-A11. Therefore the staff finds the licensee has identified sufficient hardship under 10 CFR 50.55a(a)(3)(ii).

The licensee proposed to install a mechanical clamp at the degraded body to bonnet seal weld on valve 1-1208-U4-A11 to encapsulate the steam leak. The mechanical clamp is designed using Appendix IX of the ASME Code, Section XI, as guidance with two exceptions, use of the device on a Class 1 valve under Article IX-1000(c)(1) and monitoring requirements under Article IX-6000(a). The staff reviewed the licensee's Minor Design Change 439341 and its associated worksheets, and found the licensee's design meets the requirements of Appendix IX in that all of the calculated stresses were below the code allowable stresses. The licensee had a piping analysis done to demonstrate that the piping system would continue to operate safely with the additional weight of a clamp on Valve 1-1208-U4-A11. The licensee performed calculation X4CPS0351 which concluded the new loading conditions are still acceptable and there is adequate inherent reserve margin to accommodate the increased loads from the clamp. Therefore, the staff finds the licensee's design will provide reasonable assurance of structural integrity.

To support the leakage integrity of the degraded seal weld, the licensee proposed to inject a sealant into the mechanical clamp enclosure to minimize the leakage. The licensee stated that the sealant is approved for use on a Class 1 system. The staff finds that the use of a sealant that has low concentration of halogens along with the temporary nature of the application will limit the potential for stress corrosion cracking of the stainless steel piping and valve, and is therefore acceptable in this time limited application.

The licensee proposed not to perform ultrasonic examination of the clamp area in accordance with Article IX-6000(a). In this specific case, the NRC staff finds this deviation acceptable based on the configuration of the valve and the clamp installation. Due to the temporary nature of this application and its conservative design, the staff finds the required ultrasonic examination is not necessary as any potential degradation mechanism should not affect the structural integrity of the system and clamping device. In addition, the licensee has committed to perform visual monitoring of the valve and the temporary clamp for leakage on a daily basis for seven days. If after the initial seven days no leakage is observed, a monitoring schedule of weekly remote observations along with monthly VT-2 visual examinations will be implemented to ensure the structural and leakage integrity of the temporary repair.

On the basis of the above evaluation, the NRC staff finds that the proposed alternative will provide reasonable assurance that the structural integrity and leakage integrity of the degraded seal weld on valve 1-1208-U4-A11 will be maintained until the next refueling outage.

Therefore, given the hardship presented by the licensee, the temporary nature of the proposed alternative, and the staff's review of the design of the mechanical clamping device, the NRC staff concludes that the licensee has provided sufficient technical basis to find that compliance with the limitation of Appendix IX Article XI-1000(c)(1) and required exams of Article IX-6000(a) would cause an unnecessary hardship without a compensating increase in the level of quality and safety

4.0 CONCLUSIONS

As set forth above, the NRC staff determines that the proposed alternative provides reasonable assurance of structural integrity and leak tightness of the subject components and that complying with the specified requirement would result in a hardship or unusual difficulty without a compensating increase in the level of quality and safety. Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(a)(3)(ii), and is in compliance with requirements of the ASME Code, Section XI for which relief was not requested. Therefore, in accordance with 10 CFR 50.55a(a)(3)(ii) the NRC authorizes use of the licensee's proposed alternative, VEGP-ISI-ALT-08, Version 1.0, at Vogtle Electric Generating Plant, Unit 1, until the 1R18 refueling outage in the spring of 2014.

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

Principal Contributor: Keith M. Hoffman

Date: February 7, 2013

C. Pierce

- 2 -

All other requirements in ASME Code, Section XI, and 10 CFR 50.55a for which relief was not specifically requested and approved in this RR remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

Sincerely,

/RA/

Robert Pascarelli, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-424

Enclosure: Safety Evaluation

cc w/encl: Distribution via Listserv

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