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50-425

NL-10-1663

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555-0001

Vogtle Electric Generating Plant – Units 1 and 2
VEGP-ISI-ALT-03, Version 3, Proposed Alternative for the Third ISI Interval

Ladies and Gentlemen:

By letter to the U.S. Nuclear Regulatory Commission (NRC) dated April 7, 2010, Southern Nuclear Operating Company, Inc. (SNC), submitted request for relief VEGP-ISI-ALT-03, Version 2.0. This alternative requested relief from certain examination qualification requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI. SNC proposed the use of alternate root mean square error (RMSE) values.

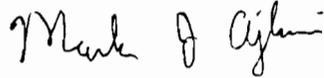
On July 30, 2010, SNC received a request for additional information letter from the NRC. This letter stated that the 2007 Edition of the ASME Code with 2009 Addenda, no longer permits the use of IWB-3514 for pressurized-water reactors with nickel alloy welds that are susceptible to primary water stress corrosion cracking (PWSCC) for planar, surface-connected flaws that are in contact with the reactor coolant environment during normal operation.

The current code of record for the Vogtle Electric Generating Plant (VEGP), 2001 Edition of the ASME Code with 2003 Addenda, requires the use of IWB-3514 acceptance criteria. While not clearly stated in Version 2 of VEGP-ISI-ALT-03, SNC's implementation of MRP-139 will dictate the performance of an IWB-3600 evaluation for any flaw attributed to PWSCC, regardless of depth per MRP-139 Section 7, Evaluation Methodologies.

SNC has revised VEGP-ISI-ALT-03 to provide clarification of acceptance criteria for internal surface connected flaws attributed to PWSCC. VEGP-ISI-ALT-03, Version 3, is provided in the enclosure.

This letter contains no NRC commitments. If you have any questions, please contact Jack Stringfellow at (205) 992-7037.

Respectfully submitted,



M. J. Ajluni
Nuclear Licensing Director

MJA/TAH/lac

Enclosure: 1. Proposed Alternative VEGP-ISI-ALT-03 Version 3.0, in Accordance with 10 CFR 50.55a(a)(3)(i)

cc: Southern Nuclear Operating Company
Mr. J. T. Gasser, Executive Vice President
Mr. T. E. Tynan, Vice President – Vogtle
Ms. P. M. Marino, Vice President – Engineering
RType: CVC7000

U. S. Nuclear Regulatory Commission
Mr. L. A. Reyes, Regional Administrator
Mr. R. E. Martin, NRR Project Manager – Vogtle
Mr. M. Cain, Senior Resident Inspector – Vogtle
Mr. P.G. Boyle, NRR Project Manager

**Vogtle Electric Generating Plant – Units 1 & 2
VEGP-ISI-ALT-03, Version 3, Proposed Alternative for the Third ISI Interval**

Enclosure 1

**Proposed Alternative VEGP-ISI-ALT-03 Version 3.0,
in Accordance with 10 CFR 50.55a(a)(3)(i)**

Enclosure 1

Proposed Alternative VEGP-ISI-ALT-03 Version 3.0 in Accordance with 10 CFR 50.55a(a)(3)(i)

Plant Site-Unit:	Vogtle Electric Generating Plant (VEGP) – Units 1 & 2.
Interval Dates:	3rd ISI Interval – May 31, 2007 through May 30, 2017.
Requested Date for Approval :	Approval is requested by February 4, 2011 to support scheduled examinations performed during Vogtle 1R16 (March 2011).
ASME Code Components Affected:	<p>The affected components are the Class 1, Category R-A, Item R1.15, Reactor Pressure Vessel (RPV) nozzle to safe-end dissimilar metal (DSM) butt welds and the adjacent Category R-A, Item R1.20, austenitic safe-end welds. Lists of welds are provided in Figures 1 and 2.</p> <p>By SNC Letter NL-09-0332 dated April 15, 2009, Vogtle submitted an ISI alternative (VEGP-ISI-ALT-02, Version 1.0) for the implementation of risk-informed/safety based inservice inspection (RIS_B ISI) for ASME Code categories B-F, B-J, C-F-1, and C-F-2 piping welds in accordance with Code Case N-716, "Alternative Piping Classification and Examination Requirements". Vogtle received approval of the RIS_B ISI alternative on March 3, 2010 (ML100610470).</p>
Applicable Code Edition and Addenda:	The applicable Code edition and addenda is ASME Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," 2001 Edition through the 2003 addenda. In addition, as required by 10 CFR 50.55a, ASME Section XI, 2001 Edition is used for Appendix VIII, "Performance Demonstration for Ultrasonic Examination Systems."
Applicable Code Requirements:	<p>Examination Category R-A, Item R1.15, "RPV nozzle to safe-end DSM butt welds" and Examination Category R-A, Item R1.20, "austenitic safe-end welds" specify volumetric examination. IWA-2232 requires that ultrasonic (UT) examinations be performed per Appendix I. Appendix I, I-2220 requires that ultrasonic examination procedures, equipment, and personnel be qualified by performance demonstration in accordance with Appendix VIII. Instead of the Appendix VIII qualification requirements, Southern Nuclear Operating Company (SNC) is using NRC approved Code Case N-695, "Qualification Requirements for Dissimilar Metal Piping Welds" and NRC approved Code Case N-696, "Qualification Requirements for Appendix VIII Piping Examinations Conducted From the Inside Surface."</p> <p>Code Case N-695 provides an alternative to the Appendix VIII, Supplement 10 requirements for the qualification requirements of DSM welds. Paragraph 3.3(c) indicates examination procedures, equipment, and personnel are qualified for depth-sizing when the Root Mean Square (RMS) error of the flaw depth measurements, as compared with the true depths, does not exceed 0.125 inches.</p>

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Code Case N-696 provides an alternative to the Appendix VIII, Supplement 2 and 10 qualification requirements for piping welds that are conducted from the inside surface. Paragraph 3.3(d) indicates examination procedures, equipment, and personnel are qualified for depth-sizing when the RMS error of the flaw depth measurements, as compared to the true depths, does not exceed 0.125 inches.

Reason for Request:

This alternative is needed because:

1. To date, the examination vendor for Vogtle has not met the required root mean square error (RMSE) of 0.125 inches for depth sizing.
2. The examination vendor for the VEGP reactor vessel nozzle examinations has qualified for detection of axial flaws in accordance with Appendix VIII, Supplements 10 and 2, as demonstrated through the Electric Power Research Institute (EPRI) Performance Demonstration Initiative (PDI) Program, for DSM nozzle-to-safe-end and austenitic safe-end welds examined from the inside diameter (ID) surface provided the surface is machined or ground smooth with no exposed root reinforcement or counter-bore. However, surface roughness may be present that could call into question the UT qualifications demonstrated for detection of axial flaws.

Note: The examination vendor has qualified for detection of circumferential flaws in accordance with Appendix VIII, Supplements 10 and 2, as demonstrated through the EPRI PDI Program, for DSM nozzle-to-safe end and austenitic safe-end welds examined from the ID surface.

Proposed Alternative

(1) Variation to 0.125 RMSE

SNC proposes to use a RMSE of 0.189 inches instead of the 0.125 inches required for Supplement 10 and a RMSE of 0.245 inches instead of the 0.125 inches required for Supplements 10 and 2 combined. In the event an indication is detected that requires depth sizing, the difference between the required RMSE and the demonstrated RMSE will be added to the measured through-wall extent for comparison with applicable ASME Section XI acceptance criteria. If the examination vendor demonstrates an improved depth sizing RMSE prior to the examination, the excess of that improved RMSE over the 0.125 inch RMSE requirement, if any, will be added to the measured value for comparison with applicable acceptance criteria.

(2) Inside Diameter UT Examinations Supplemented by Eddy-Current

SNC proposes using surface geometry profiling software (profilometry) in conjunction with a focused immersion ultrasonic transducer positioned to permit accurate profile data across the examination volume, to help the examiner confirm locations where the raw data indicates lack of transducer

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contact due to problematic surface geometry. Subsequently, eddy current examination will be used to supplement ultrasonic examination where there is sufficient surface roughness to call into question the applicability of the ultrasonic examination qualification to detect axial flaws. The ultrasonic examinations, supplemented by eddy current examinations and profilometry, will be conducted to the maximum extent practical and are subject to third party review by the Authorized Nuclear Inservice Inspector. It is anticipated that all DSM nozzle-to-safe-end welds and all safe-end welds could be examined using this process.

The following eddy current techniques will be utilized:

- Up to two plus point probes applied circumferentially on the inside surface in scan increments of 0.08 inches circumferentially (for axial flaws) and 0.25 inches axially.
- Automated systems for data collection and analysis.

The target flaw size for the eddy current procedure is 0.28 inches long, well within the ASME Code linear flaw acceptance standards of 0.45 inches for austenitic material, and 0.625 inches for ferritic material (defined for the outside surface in the Code Tables).

The examinations are scheduled to be performed during VEGP 1R16 outage (March 2011) and VEGP 2R15 outage (September 2011).

Basis for Use:

(1) Variation to 0.125 RMSE

The proposed alternative assures that the DSM nozzle-to-safe-end welds and the subject austenitic safe-end welds will be fully examined by procedures, personnel and equipment qualified by demonstration in all aspects except depth sizing. In the event that an indication is detected that requires depth sizing, a process will be used where the difference between the required RMSE and vendor demonstrated RMSE will be added to the measured through-wall depth. This amended through-wall depth will then be used to determine the acceptability of the indication. For planar indications that are not connected to the inside surface, the amended through-wall depth will be compared with the Section IWB-3500 acceptance criteria. For planar indications that are connected to the inside surface, an IWB-3600 evaluation will be performed per Section 7 of MRP-139, Revision 1 (or per future NRC rule making which supersedes MRP-139 requirements). This process will assure that there is reasonable assurance of structural integrity and thus, will provide an acceptable level of quality and safety. Permission is requested to use this process in accordance with 10 CFR 50.55a(a)(3)(i).

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(2) Inside Diameter UT Examinations Supplemented by Eddy-Current

The eddy current technique was first used in the V. C. Summer reactor vessel primary nozzle examinations of 2000. The procedure was refined by applying it to the V. C. Summer hot leg dissimilar metal weld section removed from service. The removed section had a number of primary water stress corrosion cracking flaws along with non-relevant indications resulting from metallurgical interface and surface geometry. Using these actual flaws and geometric conditions in the removed section to refine the technique, the vendor developed reliable flaw-screening criteria which allowed for the successful use of the procedure in the V. C. Summer 2002 and 2003 examinations.

Subsequently, the technique was successfully blind tested for the Swedish authority SQC Kvalificeringscentrum AB (SQC NDT Qualification Center) under the program, "Qualification of Equipment, Procedure and Personnel for Detection, Characterization and Sizing of Defects in Areas in Nozzle to Safe End Welds at Ringhals Unit 3 and 4," Hakan Soderstrand 7-10-03. The important qualification parameters for eddy current in the SQC blind tests (Ref. SQC Qualification Report No. 019AN03) were as follows:

- Defect types: fatigue and stress corrosion cracks, surface initiated
- Tilt: +/-10 degrees; Skew: +/-10 degrees
- Detection target size: IDSCC 6mm (0.25 inches) long
- Flaw Location: within 10mm (13/32 inch)
- Length of the planar flaw within a 70% confidence interval: +/- (3/8 inch)
- False call rate: less than or equal to 20% for the personnel qualification tests

As noted in the Precedents section below, Comanche Peak submitted and received approval for this technique.

The use of ultrasonic profilometry and eddy current examination, with procedures and personnel qualified through the SQC blind tests to supplement Appendix VIII qualified ultrasonic procedures and personnel, provides additional assurance that surface-breaking flaws (that may be present) will be detected in the presence of potential surface roughness. This process will assure that there is reasonable assurance of structural integrity and thus, will provide an acceptable level of quality and safety. Permission is requested to use this process in accordance with 10 CFR 50.55a(a)(3)(i).

**Duration of
Proposed
Alternative:**

The proposed alternative is applicable for the third Inservice Inspection Interval for VEGP Units 1 & 2.

Precedents:

Use of the combined qualification requirements for Supplements 2 and 10 prior to availability of Code Case N-696, and the concept of adding the difference between the required RMS error value and the demonstrated RMS error value to the measured indication depth, were separately approved for

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V.C. Summer Station by NRC letter dated February 3, 2004.

The proposed alternative was approved for profilometry and eddy current for the V. C. Summer Station by NRC letter dated November 21, 2006.

This alternative is similar to and closely follows the content and statements made in the Comanche Peak Nuclear Power Plant request submitted initially in a letter to the NRC dated July 10, 2008 and approved by the staff in a letter dated September 18, 2008. In addition, this alternative is based on the NRC Safety Evaluations for the Donald C. Cook Plant and the Seabrook Station.

Farley-2 submitted a similar alternative on April 22, 2009 per SNC letter NL-09-0410. The Farley alternative was revised per SNC letter NL-10-0266 on February 23, 2010. Farley received NRC approval on March 2, 2010. The revised Farley alternative is essentially identical to the Vogtle alternative.

References:

The referenced ADAMS numbers for the V. C. Summer Station are ML040340450 (2004 SER) and ML063070540 (2006 SER).

The referenced ADAMS number for the Comanche Peak Nuclear Plant is ML082490050.

The referenced ADAMS numbers for the Donald C. Cook Plant and the Seabrook Station are ML083540071 and ML090850504, respectively.

The referenced ADAMS number for Farley is ML100560334.

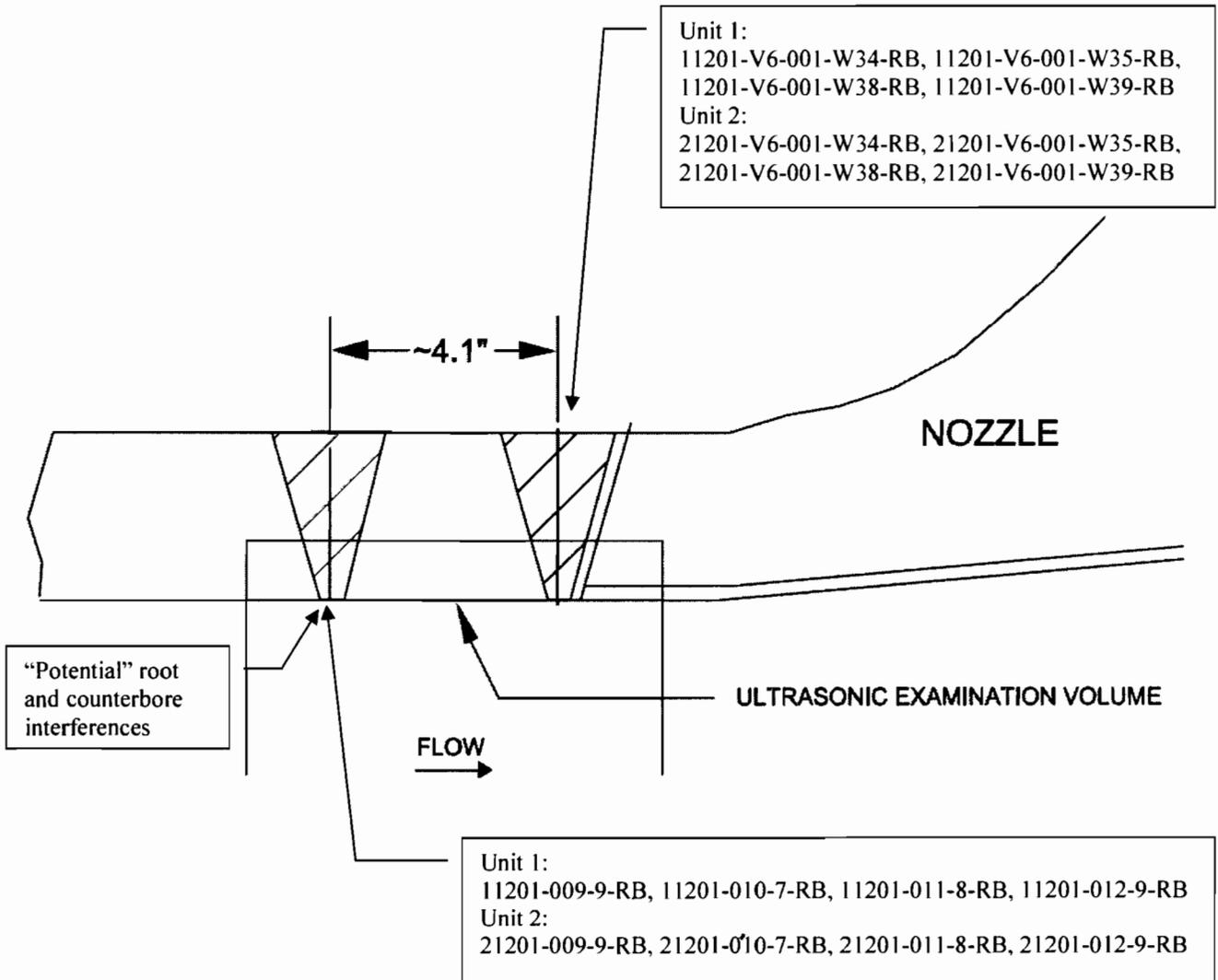
Status:

Awaiting NRC approval.

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FIGURE 1
VOGTLE-1 & 2 INLET NOZZLE WELDS



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FIGURE 2
VOGTLE-1 & 2 OUTLET NOZZLE WELDS

