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Docket Nos.: 50-348 50-424
50-425

NL-06-1305

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

Joseph M. Farley Nuclear Plant – Unit 1
Vogtle Electric Generating Plant
Inservice Inspection Alternatives for Reactor Pressure Vessel Examinations

Ladies and Gentlemen:

Southern Nuclear Operating Company (SNC) is requesting two Inservice Inspection (ISI) Alternatives (ISI-GEN-ALT-06-01 and -02) for the Reactor Pressure Vessel (RPV) Examinations scheduled for the Farley Nuclear Plant (FNP) 3rd ISI Interval extending from December 1, 1997 through November 30, 2007 and for the Vogtle Electric Generating Plant (VEGP) 2nd ISI Interval extending from May 31, 1997 through May 30, 2007. One alternative is related to the RPV shell to flange weld and proposes that this weld be examined using Appendix VIII instead of Article 4 of ASME Section V. The second alternative is related to the examination of the safe-end welds in the reactor coolant piping and proposes to use Code Case N-696.

Approval is requested by September 1, 2006 to support scheduled examinations performed during the planned Unit 1 outage at VEGP beginning September 2006, the Unit 2 outage at VEGP beginning March 2007, and the Unit 1 outage at FNP beginning October 2007.

This letter contains no NRC commitments. If you have any questions, please advise.

Sincerely,

A handwritten signature in black ink, appearing to read "D. E. Grissette", written in a cursive style.

D. E. Grissette

DEG/JLS/sdl

Enclosures: 1. Request for Alternative - ISI-GEN-ALT-06-01 - RPV Flange Welds
2. Request for Alternative - ISI-GEN-ALT-06-02 - RPV Dissimilar Welds

U. S. Nuclear Regulatory Commission

NL-06-1305

Page 2

cc: Southern Nuclear Operating Company
Mr. J. T. Gasser, Executive Vice President
Mr. H. L. Sumner, Vice President – Plant Farley
Mr. J. R. Johnson, General Manager – Plant Farley
Mr. T. E. Tynan, General Manager – Plant Vogtle
RType: CFA04.054; CVC7000; LC# 14444

U. S. Nuclear Regulatory Commission
Dr. W. D. Travers, Regional Administrator
Mr. R. E. Martin, NRR Project Manager – Farley
Mr. C. Gratton, NRR Project Manager – Vogtle
Mr. C. A. Patterson, Senior Resident Inspector – Farley
Mr. G. J. McCoy, Senior Resident Inspector – Vogtle

Enclosure 1

Request for Alternative - ISI-GEN-ALT-06-01 - RPV Flange Welds

- Plant Site-Unit:** Vogtle Electric Generating Plant (VEGP) Units 1 and 2 and Joseph M. Farley Nuclear Plant (FNP) - Unit 1.
- Interval Dates:** VEGP 1 & 2
2nd Inservice Inspection (ISI) Interval extending from May 31, 1997 through May 30, 2007 and

FNP 1
3rd ISI Interval extending from December 1, 1997 through November 30, 2007.
- Requested Date for Approval :** Approval is requested by September 1, 2006 to support scheduled examinations performed during VEGP 1R13 (September 2006), VEGP 2R12 (March 2007) and FNP 1R21 (October 2007).
- ASME Code Components Affected:** *Category B-A, Item B1.30, Reactor Pressure Vessel (RPV) shell-to-flange welds*
- 11201-V6-001-W03 (Vogtle 1)
 - 21201-V6-001-W03 (Vogtle 2)
 - ALA1-1100-1 (Farley 1)
- Applicable Code Edition and Addenda:** The Vogtle and Farley Units are in their 2nd and 3rd inspection intervals, respectively. The applicable Code edition and addenda is ASME Section XI, "Rules for Inservice Inspection of Nuclear Power Plant components," 1989 Edition with no addenda. In addition, as required by 10 CFR 50.55a, ASME Section XI, 1995 Edition through 1996 Addenda is used for Appendix VIII, "Performance Demonstration for Ultrasonic Examinations."
- Applicable Code Requirements:** Per requirements of the 1989 Edition of ASME Section XI, Article I, these weld examinations are conducted in accordance with Article 4 of Section V. Article 4 requires the volume of the weld and adjacent base material (volume on either side of the weld seam) to be examined by straight (0°) and angle beams (45°, 60° and 70°). Wherever feasible, the examination shall be carried out from both sides of the weld from the same surface. The examination volume shall be scanned with angle beam search units directed both at right angles to the weld axis and along the weld axis. All angle beam reflectors producing a response greater than 20% distance amplitude correction are required to be recorded and evaluated. FNP and VEGP have also committed to follow Regulatory Guide 1.150, Revision 1, "Ultrasonic Testing of Reactor Vessel Welds During Preservice and Inservice Examinations," which augments the ultrasonic testing (UT) of RPV welds. In addition, 1989 ASME Section XI allows partial inspection of the vessel to flange weld from the flange face with the remainder to be completed at the end of the ISI interval.

Reason for Request:

10 CFR 50.55a requires that ASME Section XI, Appendix VIII, Supplement 4, "Qualification Requirements For The Clad/Base Metal Interface of Reactor Vessel," and Supplement 6, "Qualification Requirements For Reactor Vessel Welds Other Than Clad/Base Metal Interface," be implemented for most of the RPV welds by November 22, 2000. However, the RPV shell-to-flange weld examinations were not included in this requirement. This alternative will allow the use of Performance Demonstration Initiative (PDI) qualified procedures to perform the examination of these welds in accordance with ASME Section XI, Division 1, 1995 Edition through the 1996 Addenda. Appendix VIII Supplement 4 and 6 as amended by 10 CFR 50.55a will be used in lieu of ASME Section V, Article 4, which includes examinations performed from the flange surface.

Proposed Alternative and Basis for Use:**Proposed Alternative:**

In lieu of the Article 4 of Section V angle beam examination, SNC proposes to use an angle beam examination that will be performed using applicable examination procedures, personnel, and equipment qualified in accordance with Appendix VIII, Supplements 4 and 6, as amended by the conditions set forth in 10 CFR 50.55a.

The Section XI required examination volume will be scanned by a remote mechanized system for flaws using procedures and techniques that have been qualified for Appendix VIII.

The RPV welds are clad. Therefore, the requirements of Supplements 4 and 6 of ASME Section XI Appendix VIII, 1995 Edition with 1996 Addenda will apply. (To demonstrate equivalency to two sided examinations, the demonstration must be performed to the requirements of Appendix VIII as modified by this paragraph and 10 CFR 50.55a(b)(2)(xv)(B) through (G), on specimens containing flaws with non-optimum sound energy reflecting characteristics or flaws similar to those in the vessel being examined.) Examination of the Section XI required volume will be performed as follows:

Per 10 CFR 50.55a(b)(2)(xv)(G)(1), the clad to base metal interface, including a minimum of 15 percent T (measured from the clad to base metal interface), shall be examined from four orthogonal directions using procedures and personnel qualified in accordance with Supplement 4 to Appendix VIII. The flange weld will have geometric limitations due to configuration. However, the welds will be examined to the specified requirements to the fullest extent possible (i.e., scanning from both directions when achievable).

Per 10 CFR 50.55a(b)(2)(xv)(G)(2), if the clad-to-base-metal-interface procedure demonstrates detectability of flaws with a tilt angle relative to the weld centerline of at least 45 degrees, the remainder of the examination volume is considered fully examined if coverage is obtained in one parallel and one perpendicular direction. This must be accomplished using a procedure and personnel qualified for single-side examination in accordance with Supplement 6. Subsequent examinations of this volume may be performed using examination techniques qualified for a tilt angle of at least 10 degrees.

Per 10 CFR 50.55a(b)(2)(xv)(G)(3), the examination volume not addressed by 50.55a(b)(2)(xv)(G)(1) is considered fully examined if coverage is obtained in one parallel and one perpendicular direction, using a procedure and personnel qualified for single sided examination when the provisions of § 50.55a(b)(2)(xv)(G)(2) are met.

Basis for Use:

The referenced welds were excluded in the requirement for examination in accordance with the requirements of ASME Section XI, Appendix VIII, as mandated by 10 CFR 50.55a with the issuance of the rule change shown in the Federal Register Notice 64 FR 51370, dated September 22, 1999. This rule change mandated the use of ASME Section XI, Appendix VIII, Supplements 4 and 6 for the conduct of most RPV examinations.

Appendix VIII requirements were developed to ensure the effectiveness of UT examinations within the nuclear industry by means of a rigorous, item-specific performance demonstration. The performance demonstration (through PDI) was conducted on RPV mockups containing flaws of various size and allocations. The demonstration established the capability of equipment, procedures, and personnel to find flaws that could be detrimental to the integrity of the RPV. The performance demonstration showed that for the detection of flaws in RPV welds, the UT techniques were equal to or surpassed the requirements of Section V, Article 4 of the ASME Code. Additionally, the PDI qualified sizing techniques are considered to be more accurate than the techniques used in Article 4 of Section V.

The EPRI Report NP-6273, "Accuracy of Ultrasonic Flaw Sizing Techniques for Reactor Vessels," dated March 1989, established that UT sizing techniques based on tip diffraction are the most accurate. The qualified prescriptive-based UT procedures of ASME Section V, Article 4 have been applied in a controlled process with mockups of RPVs which contained real flaws and the results statistically analyzed according to the screening criteria in Appendix VIII of ASME Section XI. The results show that the procedures in Section V, Article 4, are less effective in detecting flaws than procedures qualified in accordance with Appendix VIII, as administered by the PDI processes. Appendix VIII/PDI qualification procedures use the tip diffraction techniques for flaw sizing. The proposed alternative Appendix VIII/PDI UT methodology uses analysis tools based upon the echo dynamic motion and tip diffraction criteria which has been validated, and is considered more accurate than the Section V, Article 4 processes.

It has been recently stated in coordination meetings between PDI committee members and NRC staff representatives, that the NRC Staff expectations are that licenses should submit alternatives to use the more technically advanced Appendix VIII/PDI process for RPV flange weld exams, in lieu of Section XI Appendix I and its associated Section V, Article 4 processes.

Although Appendix VIII is not required for the RPV shell-to-flange weld, the use of Appendix VIII criteria for detection and sizing of flaws in these welds will be equal to, or will exceed the requirements established by Article 4 of Section V. Therefore, the use of this proposed alternative will continue to provide an acceptable level of quality

and safety, and approval is requested pursuant to 10 CFR 50.55a(a)(3)(i).

Duration of Proposed Alternative: The proposed alternative is applicable for the remaining 2nd Inservice Inspection Interval for VEGP and remaining 3rd Inservice Inspection Interval for FNP Unit 1.

Precedents: This alternative is similar to and closely follows the content and statements made in the Duke Energy Company request for Oconee, McGuire, and Catawba Nuclear Stations, submitted initially in a letter to the NRC dated July 14, 2004 and approved by the staff in a letter dated October 20, 2004. In addition, this alternative is similar to and closely follows the content and statements made by TVA's request for Browns Ferry, Sequoyah and Watts Bar Nuclear Plants, submitted initially in a letter to the NRC dated February 23, 2005 and approved by the staff in a letter dated August 2, 2005.

References: None

Status: Awaiting NRC approval.

Enclosure 2

Request for Alternative - ISI-GEN-ALT-06-02 - RPV Dissimilar Welds

Plant Site-Unit: Vogtle Electric Generating Plant (VEGP) Units 1 and 2 and Joseph M. Farley Nuclear Plant (FNP) - Unit 1.

Interval Dates: VEGP 1 & 2
2nd Inservice Inspection (ISI) Interval extending from May 31, 1997 through May 30, 2007 and

FNP 1
3rd ISI Interval extending from December 1, 1997 through November 30, 2007.

Requested Date for Approval : Approval is requested by September 1, 2006 to support scheduled examinations performed during VEGP 1R13 (September 2006), VEGP 2R12 (March 2007) and FNP 1R21 (October 2007).

ASME Code Components Affected: *Category R-A, Item R1.15; Reactor Pressure Vessel (RPV) nozzle to safe-end dissimilar metal butt welds (Farley and Vogtle have both implemented risk-informed ISI):*

- 11201-V6-001-W33, W34, W35, W36, W37, W38, W39 & W40 (Vogtle 1)
- 21201-V6-001-W33, W34, W35, W36, W37, W38, W39 & W40 (Vogtle 2)
- ALA1-4100-1DM, 14DM, 4200-1DM, 14DM and 4300-1DM, 14DM (Farley 1)

Applicable Code Edition and Addenda: The Vogtle and Farley Units are in their 2nd and 3rd inspection intervals, respectively. The applicable Code edition and addenda is ASME Section XI, "Rules for Inservice Inspection of Nuclear Power Plant components," 1989 Edition with no addenda. In addition, as required by 10 CFR 50.55a, ASME Section XI, 1995 Edition through 1996 Addenda is used for Appendix VIII, Performance Demonstration for Ultrasonic Examinations.

Applicable Code Requirements: *Category R-A, Item R1.15; RPV nozzle to safe-end dissimilar metal butt welds (Farley and Vogtle have both implemented risk-informed ISI):*
Per the requirements of 10 CFR 50.55a, these examinations are required to be conducted in accordance with ASME Section XI, Appendix VIII, 1995 Edition with 1996 addenda.

Reason for Request: It is requested to use an alternative to Appendix VIII, Supplements 2, 3, and 10 for the reactor coolant welds near the reactor vessel nozzles that are examined with the remote automated vessel examination tool. Code Case N-696 provides alternate depth sizing criteria for combined qualifications of Supplements 2, 3, and 10 when the examinations are conducted from the inside surface.

Proposed Alternative and Basis for Use: **Proposed Alternative:**
Utilize Code Case N-696 which provides alternate depth sizing criteria for combined

qualifications of Supplements 2, 3, and 10 when the examinations are conducted from the inside surface.

Basis for Use:

ASME Code Case N-696, "Qualification Requirements for Appendix VIII Piping Examinations Conducted From the Inside Surface, Section XI, Division 1," was passed by the ASME Main Committee on May 21, 2003, but has not yet been addressed in the published Regulatory Guides or drafts. Code Case N-696 addresses the combined qualification for Supplement 10 in conjunction with Supplements 2 and 3 when examinations are conducted from the inside surface. To date, although examination vendors have qualified for detection and length sizing on these welds, no examination vendors have met the established 0.125-inch root mean square error (RMSE) for depth sizing.

Should indications be detected which require depth sizing, SNC's vendor shall apply the difference in allowable depth sizing tolerance from that actually demonstrated to the flaw depths measured, compensating for the variance.

Use of Code Case N-696 with the stated compensation for depth sizing tolerance provides an acceptable level of quality and safety in accordance with 10 CFR 50.55a(a)(3)(i).

Duration of Proposed Alternative:

The proposed alternative is applicable for the remaining 2nd Inservice Inspection Interval for VEGP and remaining 3rd Inservice Inspection Interval for FNP Unit 1.

Precedents:

Use of the combined qualification requirements for Supplements 2, 3, and 10 prior to availability of Code Case N-696, and the concept of adding the difference between the required RMSE value and the demonstrated RMSE value to the measured indication depth, were separately approved for V.C. Summer Station by NRC letter dated February 3, 2004.

This alternative is similar to and closely follows the content and statements made in the Diablo Canyon request submitted initially in a letter to the NRC dated April 1, 2005 and approved by the staff in a letter dated October 26, 2005.

References:

None

Status:

Awaiting NRC approval.