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SOUTHERN COMPANY

March 28, 2011

Docket Nos.: 50-348

NL-11-0463

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

Joseph M. Farley Nuclear Plant Unit 1
Proposed Relief Request for the Fourth ISI Interval
(FNP-ISI-RR-01)

Ladies and Gentlemen:

Pursuant to 10 CFR 50.55a(g)(5)(iii), Southern Nuclear Operating Company (SNC) requests approval to use an alternate depth-sizing qualification for volumetric examinations of the reactor pressure vessel (RPV) nozzle-to-safe end dissimilar metal (DSM) welds from the inside surface. Specifically, SNC proposes to use a root mean square error criterion for sizing flaws that is greater than that allowed by the ASME Code. This relief request is similar to Seabrook Station's (Unit 1) request for use of an alternate depth-sizing qualification that was approved by the NRC in letter (TAC No. ME3623) dated November 22, 2010.

The basis for the proposed relief request for Farley Nuclear Plant Unit 1 is provided in the Enclosure to this letter.

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

Sincerely,

M. J. Ajluni
Nuclear Licensing Director

MJA/LPH/lac

Enclosure: Proposed Relief Request FNP-ISI-RR-01, Version 1.0,
Per 10 CFR 50.55a(g)(5)(iii)

cc: Southern Nuclear Operating Company
Mr. J. T. Gasser, Executive Vice President
Mr. L. M. Stinson, Vice President – Farley
Ms. P. M. Marino, Vice President – Engineering
RTYPE: CFA04.054

U. S. Nuclear Regulatory Commission
Mr. V.M. McCree, Regional Administrator
Mr. R. E. Martin, NRR Project Manager – Farley
Mr. E. L. Crowe, Senior Resident Inspector – Farley
Mr. P. Boyle, NRR Project Manager

**Joseph M. Farley Nuclear Plant – Unit 1**
**Proposed Relief Request for the Fourth ISI Interval**

**Enclosure 1**

**Proposed Relief Request FNP-ISI-RR-01, Version 1.0,**
**Per 10 CFR 50.55a(g)(5)(iii)**

**Enclosure 1**
**Proposed Relief Request FNP-ISI-RR-01, Version 1.0,**
**Per 10 CFR 50.55a(g)(5)(iii)**

**Plant Site-Unit:** Joseph M. Farley Nuclear Plant (FNP) - Unit 1.

**Interval Dates:** 4th ISI Interval – December 1, 2007 through November 30, 2017.

**Requested Date for Approval:** Approval is requested by January 3, 2012 to support scheduled examinations performed during FNP 1R24 (March 2012).

**ASME Code Components Affected:** The affected components are the Class 1, Category B-F, Item B5.10, Reactor Pressure Vessel (RPV) nozzle to safe-end dissimilar metal (DSM) butt welds, as follows:

| | |
|---|---|
| ALA1-4100-1DM | Loop 1 Outlet Nozzle To Safe-End |
| ALA1-4200-1DM | Loop 2 Outlet Nozzle To Safe-End |
| ALA1-4300-1DM | Loop 3 Outlet Nozzle To Safe-End |
| ALA1-4100-14DM | Loop 1 Safe-End To Inlet Nozzle |
| ALA1-4200-14DM | Loop 2 Safe-End To Inlet Nozzle |
| ALA1-4300-14DM | Loop 3 Safe-End To Inlet Nozzle |

**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:** The volumetric examination specified by Examination Category B-F, Item B5.10, "RPV nozzle to safe-end DSM butt welds" will be performed using the ultrasonic (UT) examination method as described in IWA-2232 and 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."

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.

**Enclosure 1**
**Proposed Relief Request FNP-ISI-RR-01, Version 1.0,**
**Per 10 CFR 50.55a(g)(5)(iii)**

**Impracticality of Compliance:**

Southern Nuclear Operating Company will be performing volumetric examinations of the RPV nozzle-to-safe end dissimilar metal welds from the inside surface during the upcoming 1R24 outage (March 2012) and will implement the alternative requirements of ASME Code Case N-695. Code Case N-695 requires that qualified procedures and personnel shall demonstrate a flaw depth-sizing error less than or equal to 0.125 inch RMS. This relief request is being submitted due to the impracticality of meeting the required 0.125 inch RMS value required by Code Case N-695. The nuclear power industry has attempted to qualify personnel and procedures for depth-sizing examinations performed from the inside surface of dissimilar metal welds since November 2002. To date, no domestic inspection vendor has met RMS error requirements of Code Case N-695.

The inability of examination procedures to achieve the required RMS error value is primarily due to a combination of factors such as surface condition (e.g., roughness), scan access, base materials, and the dendritic structure in the welds themselves. The combination of these factors has proven too difficult for vendors to achieve an RMS error value that meets the established requirements.

**Burden Caused by Compliance:**

The most recent attempt at achieving 0.125 inch RMS error was in early 2008. This attempt, as well as previous attempts, did not achieve the required RMS error value. The qualification attempts have been substantial. The attempts have involved multiple vendors, ultrasonic instruments, personnel, and flaw depth-sizing methodologies, all of which have been incapable of achieving the 0.125 inch RMS error value.

The process of qualification for this type of flaw sizing is well established. The cost and effort involved to perform a successful demonstration is quantifiable when a capable technique is available. However, when a capable technique is not available, the costs and effort required for a successful demonstration cannot be easily quantified.

**Proposed Alternative and Basis for Use:**

SNC proposes using an alternative depth-sizing RMS error value greater than the 0.125 inch RMS error value stated in ASME Code Case N-695 for the examination of welds listed above. SNC proposes to use a RMS error of 0.189 inches (based on the results achieved by SNC's examination vendor) instead of the 0.125 inches required for Code Case N-695. In the event an indication is detected that requires depth-sizing, the difference between the required RMS error and the demonstrated RMS error 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 RMS error prior to the examination, the excess of that improved RMS error over the 0.125 inch RMS error requirement, if any, will be added to the measured value for comparison with applicable acceptance criteria. In the event that an indication is detected that requires depth-sizing, a process will

be used where the difference between the required RMS error and vendor demonstrated RMS error 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, as follows:

- 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 (such as the expedited implementation of Code Case N-770) which will supersede MRP-139 requirements.

The proposed alternative assures that the DSM nozzle-to-safe-end welds will be fully examined by procedures, personnel and equipment qualified by demonstration in all aspects except depth-sizing. Therefore, it will assure that there is reasonable assurance of structural integrity and thus, will provide an acceptable level of quality and safety. Pursuant to 10 CFR 50.55a(g)(5)(iii), relief is requested to use this alternative depth-sizing error due to impracticality.

**Duration of Proposed Relief Request:** The proposed relief request is applicable for the 4th Inservice Inspection Interval for FNP Unit 1.

**Precedents:** Seabrook Station Unit No. 1 has received approval of a similar relief request.

**References:** Seabrook submitted their relief request by letter dated March 25, 2010 (ML100890436) as supplemented by letter dated August 31, 2010 (ML102500268). NRC approval was granted by letter dated November 22, 2010 (ML103190139).

**Status:** Awaiting NRC approval.