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Docket Nos.: 50-348
50-364

NL-11-0941

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

**Joseph M. Farley Nuclear Plant, Units 1 and 2
NRC Request for Addition Information for
Risk-Informed ISI Alternative FNP-ISI-ALT-12, Version 2.0**

Ladies and Gentlemen:

By letter dated January 5, 2011, Southern Nuclear Operating Company Inc. (SNC) submitted alternative FNP-ISI-ALT-12, Version 2.0, for U.S. Nuclear Regulatory Commission (NRC) review and approval. Subsequently, by letter dated April 27, 2011 (ADAMS Accession Number ML11094A008) the NRC submitted a request for additional information (RAI) to enable completion of the review. The responses to the NRC RAIs are provided in the Enclosure.

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

Sincerely,

A handwritten signature in black ink that reads "Mark J. Ajluni". The signature is written in a cursive, flowing style.

M. J. Ajluni
Nuclear Licensing Director

MJA/LWW/lac

Enclosure: Farley Nuclear Plant – Units 1 and 2, FNP-ISI-ALT-12, Version 2.0,
RAI Responses

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. G. Boyle, NRR Project Manager

**Joseph M. Farley Nuclear Plant, Units 1 and 2
NRC Request for Addition Information for
Risk-Informed ISI Alternative FNP-ISI-ALT-12, Version 2.0**

Enclosure

**Farley Nuclear Plant – Units 1 and 2, FNP-ISI-ALT-12, Version 2.0,
RAI Responses**

By letter dated January 5, 2011 (Agencywide Documents Access and Management System (ADAMS), Accession No. ML110060173), Southern Nuclear Operating Company, Inc. (SNC) submitted Relief Request (RR) FNP-ISI-ALT-12, Version 2.0, for U.S. Nuclear Regulatory Commission (NRC) review and approval, which requests the use of alternative risk-informed inservice inspection (RI-ISI) selection and examination criteria for Category B-F, B-J, C-F-1, and C-F-2 pressure retaining piping welds. To enable completion of the review, the NRC staff requests additional information as follows:

1. NRC RAI

In Enclosure 1, Section 2.2 of the RR, under the fourth bullet, the FNP examination program for dissimilar metal butt welds is discussed. The second paragraph's first sentence states, "Even though Code Case N-716 only considers the RPV [reactor pressure vessel] hot leg nozzle Alloy 82/182 weld locations to be susceptible to PWSCC [primary water stress corrosion cracking], SNC has selected all six welds to be ultrasonically examined for PWSCC within the scope of Code Case N-716." The third sentence of this paragraph states, "However, the examination frequency of these eight welds is currently based on the frequencies established by the requirements of Materials Reliability Program (MRP)-139, Revision 1." Clarify this discrepancy in the number of welds considered to be susceptible to PWSCC and examined in accordance with MRP-139.

SNC Response

The sentence should read, "However, the examination frequency of these six welds is currently based on the frequencies established by the requirements of Materials Reliability Program (MRP)-139, Revision 1."

2. NRC RAI

In Enclosure 1, Section 3.1 (5) of the RR, SNC states that, "During the review, it was determined that in order to reduce the flooding scenario frequencies due to the postulated rupture of fire protection piping in the auxiliary building areas (210, 211, 228, and 234 for Unit 1 and 2210, 2211, 2228, and 2234 for Unit 2) that supplementary visual inspection of the associated fire protection piping is required every quarter. With these inspections, no piping segments with a contribution to CDF [core damage frequency] greater than 1E-06 (1E-07 for LERF [large early release frequency]) were identified."

This appears to be a deviation from the methodology of Code Case N-716 which would apply high safety significance to the segments with a contribution to CDF greater than 1E-6 and require additional volumetric examinations. Please provide justification for this approach. Discuss how the quarterly visual exams reduce the flooding frequencies. Were the degradation mechanisms applicable to the fire protection piping evaluated? Discuss the classification results if the quarterly visual examinations are not performed.

SNC Response

The core damage and large early release frequencies for this postulated flooding event are approximately $1E-6$ if quarterly visual examinations are not performed. Therefore, without performing the visual examinations, the piping would be classified as high safety significant. The visual examination is credited in the internal flooding analysis to adjust the pipe rupture frequency. The credit is based on the application of revised EPRI methodology (Pipe Rupture Frequencies for Internal Flooding Probabilistic Risk Assessments, EPRI, Palo Alto, CA: 2006. 1021086 Draft Revision 2, May 2010) which results in less than an order of magnitude reduction in the pipe rupture frequency for fire protection piping identified in NRC RAI 2 by incorporating a quarterly visual inspection. The reduction is based on the 0.9 probability of detection for finding a leak in the piping where there is an easy accessibility of the piping, as discussed below. The Code Case N-716 requirement is for those piping segments that are found to be high safety significant (HSS) per a realistic internal flooding analysis where risk reducing credits, such as visual inspections, are already included in the assessment. Therefore, it was judged that Code Case N-716 requirements for additional volumetric examinations did not apply to the subject fire protection piping. The following paragraph presents additional information which provides reasonable assurance that applying the EPRI methodology recommended pipe-rupture frequency correction was justified for the subject fire protection piping.

The subject fire protection piping material is A106 GR. B carbon steel and the nominal wall thickness is Schedule 40 with welded joint construction. The fire protection system utilizes untreated well water as the primary water source, with a service water backup. The Farley-specific experience is that indoor fire protection lines of similar construction will exhibit detectable leakage well in advance of an overall integrity concern. For carbon steel piping, with untreated well water, the postulated degradation mechanism is wall loss due to pitting (or possibly microbiological induced corrosion). The subject piping is generally located just overhead in the auxiliary building areas (210, 211, 228, and 234 for Unit 1 and 2210, 2211, 2228, and 2234 for Unit 2) and is easily accessible for visual examinations. Therefore, leakage should be detected well before the piping is degraded to the extent that it would break and create the flooding scenario.

Additionally, and as an added level of assurance, since the January 5, 2011 submittal to the NRC, SNC has been performing additional evaluations of the subject piping. This includes walkdowns of the subject piping to better define the scope and to evaluate the fabrication requirements. The walkdowns indicated that Farley Unit 1 has approximately 56 welds and Farley Unit 2 has approximately 75 welds in the scope. The piping includes 8" diameter headers, plus 2.5" and 4" diameter branch lines. The piping was fabricated and erected per American National Standards Institute (ANSI) B31.1, Class III requirements. During construction, the welds were only required to receive a visual examination; therefore, the weld crowns were not prepped and were left in an "as-welded" configuration.

Even though the use of the visual examinations, as described above, reduced the failure frequencies and subsequently lowered the Code Case N-716

classification from high to low safety significance, SNC has determined that the subject welds will be categorized as Category R-A, Item R1.17, HSS welds. Item R1.17 welds are those welds that are subject to localized corrosion and a volumetric examination is required to verify the minimum wall thickness. During a ten-year inservice inspection interval, six Farley Unit 1 welds and eight Farley Unit 2 welds will be examined to verify that the wall thickness meets minimum wall requirements. Performance of these thickness measurements, along with the previously discussed visual examinations, will provide reasonable assurance that the structural integrity of the subject fire protection piping is being maintained.