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

November 26, 2012

MEMORANDUM TO: Robert J. Pascarelli, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

FROM: John P. Boska, Senior Project Manager
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

SUBJECT: VIRGIL C. SUMMER NUCLEAR STATION, UNIT NO. 1, VERBAL APPROVAL OF ALTERNATIVE FOR OVERLAY REPAIR OF REACTOR VESSEL HEAD PENETRATIONS (TAC NO. ME9851)

On November 19, 2012, the U.S. Nuclear Regulatory staff from the Office of Nuclear Reactor Regulation (NRR) granted verbal approval for an alternative to Title 10 of the *Code of Federal Regulations*, Part 50, Section 50.55a, to allow the licensee to perform overlay repairs to reactor vessel head penetrations. The details of the verbal approval are in the enclosure to this memo. This memo documents the verbal approval as required by the NRR Office Instruction LIC-102.

Docket No. 50-395

Enclosure:
Verbal Approval Statement

cc w/ encl: Distribution via Listserv

U.S. NUCLEAR REGULATORY COMMISSION

VERBAL APPROVAL OF ALTERNATIVE FOR

OVERLAY REPAIR OF

REACTOR VESSEL HEAD PENETRATIONS

VIRGIL C. SUMMER NUCLEAR STATION, UNIT NO. 1

DOCKET NO. 50-395

Piping and NDE Branch Chief (Tim Lupold)

By letter dated October 30, 2012, as revised and supplemented by letters dated November 5, 2012 , November 14, 2012 and November 16, 2012, South Carolina Electric & Gas Company (the licensee), submitted proposed alternative Relief Request (RR)-III-09, "Alternative Weld Repair for Reactor Vessel Head Penetration," for U.S. Nuclear Regulatory Commission (NRC) review and authorization. Specifically, the licensee requested relief from American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, paragraph IWA-4420, "Defect Removal Requirements," that requires that defects be removed or mitigated. The licensee is proposing to use the provisions of Westinghouse Topical Report WCAP-15987-P-A, Revision 2, for performing an embedded flaw repair of the indications found in control rod drive mechanism (CRDM) penetration nozzle tubes 19, 31, 37, and 52 at Virgil C. Summer Nuclear Station, Unit 1 (Summer). The licensee has submitted the proposed alternative on the basis that the proposed alternative provides an acceptable level of quality and safety, in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Section 50.55, Paragraph 50.55a(a)(3)(i).

The licensee states that their proposed alternative, as described by Section 5.1 of the submittal, will use the methodology of the NRC approved WCAP-15987-P-A with modifications. The NRC staff reviewed Section 5.1 to ensure the licensee's proposed actions would meet the requirements of WCAP-15987-P-A, and that any modifications would be acceptable. As part of this review the NRC staff identified the following technical changes:

1. Cracks in the Alloy 600 penetration nozzle tube material will be embedded with two weld layers of Alloy 52 rather than three layers specified in WCAP-15987-P-A.

2. A single layer consisting of at least 3 beads of stainless steel 309L will be installed on the reactor vessel head clad surface 360 degrees around at a distance of approximately 0.5 inches from the toe of the J-groove weld prior to deposition of the first Alloy 52 layer.

Enclosure

3. Nondestructive examination of the repair will be performed in accordance with ASME Code Case N-729-1, as conditioned by 10 CFR 50.55a(g)(6)(ii)(D). The staff has reviewed each of these technical changes and finds that the proposed alternative meets the methodology approved by the NRC for an effective embedded flaw repair.

The staff has reviewed the plant-specific Westinghouse Technical Basis document LTR-PAFM-12-137-NP, Revision 2, which calculates the fatigue lifetime of the repair. The staff compared the lifetime calculations to those for plants with similar construction and notes that the present evaluation predicts a fatigue life time in excess of 20 years, as compared to at least 10 years of service life for similar plants. By letter dated November 16, 2012, the licensee described the reasons for the differences. The staff accepts the licensee's explanation of the plant-specific differences and finds that the present 20-year life time prediction calculation is acceptable.

The Piping and Non-Destructive Examinations Branch staff concludes that the proposed alternative provides an acceptable level of quality and safety in accordance with 10 CFR 50.55a(a)(3)(i).

DORL Branch Chief (Robert Pascarelli)

On the basis of the above evaluation, the NRC finds that the proposed alternative for repair of indications found on control rod drive mechanism penetration tubes numbers 19, 31, 37, and 52 will provide an acceptable level of quality and safety. The NRC therefore concludes that the regulatory requirements of 10 CFR 50.55a(a)(3)(i) have been fulfilled and authorizes use of the proposed alternative at Summer for the remainder of the third 10-year inservice inspection interval which ends December 31, 2013.

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

Dated: November 19, 2012

November 26, 2012

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