May 7, 2015

MEMORANDUM TO: Shana R. Helton, Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

FROM: Martha Barillas, Project Manager ***/RA/***
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

SUBJECT: SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1 – VERBAL AUTHORIZATION OF RELIEF REQUEST I3R-15, REVISION 2, FOR REACTOR VESSEL CLOSURE HEAD PENETRATION NOZZLE REPAIR TECHNIQUE, INSERVICE INSPECTION PROGRAM – THIRD 10-YEAR INTERVAL (TAC NO. MF6053)

By letter dated April 15, 2015 (Agencywide Documents Access and Management System Accession No. (ADAMS) ML15105A521), as supplemented by letters dated April 24, 2015, and April 29, 2015 (ADAMS Accession Nos. ML15114A480 and ML15120A406, respectively), Duke Energy Progress, Inc. (the licensee) submitted Relief Request I3R-15, Revision 2, Reactor Vessel Closure Head Nozzle Repair Technique, Inservice Inspection Program – Third 10-Year Interval for Shearon Harris Nuclear Power Plant, Unit 1. Pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.55a, the licensee requested the U.S. Nuclear Regulatory Commission (NRC) approval of an alternative for the repair examination requirements of the American Society of Mechanical Engineers (ASME) Code associated with a reactor vessel closure head penetration nozzle numbers 14, 18, and 23.

The licensee proposed to use the alternatives in ASME Code, Section XI, Code Case N-638-1, and Code Case N-729-1, to complete the repair procedures and nondestructive evaluation examinations.

The NRC staff reviewed the licensee's submittal and determined that the proposed alternative will provide an acceptable level of quality and safety. During a conference call with the licensee on May 4, 2015, the NRC staff granted a verbal authorization on the use of Relief Request I3R-15, Revision 2, in accordance with 10 CFR 50.55a(z)(1). The script for the verbal authorization is enclosed.

NRC Participants:		Licensee Participants:	
B. Beasley	C. Pfefferkorn	B. Waldrep	D. Brewer
A. Hon		J. Dufner	D. Corlett
J. Tsao		D. Hayes	J. Caves
D. Alley		S. O'Connor	

Docket No. 50-400

Enclosure:
Verbal Authorization Script

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Docket No. 50-400

Enclosure:
Verbal Authorization Script

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DATE	5/6/15	5/6/15	5/6/15	5/7/15	5/7/15

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VERBAL AUTHORIZATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

FOR RELIEF REQUEST I3R-15, REVISION 2

ALTERNATE REPAIR OF REACTOR VESSEL CLOSURE HEAD PENETRATION NOZZLES

DUKE ENERGY PROGRESS, INC.

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1

DOCKET NO. 50-400

Technical Evaluation Read by David Alley, Chief of the Component Performance, Non-Destructive Examination, and Testing Branch, Office of Nuclear Reactor Regulation

By letter to the U.S. Nuclear Regulatory Commission (NRC) dated April 15, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15105A521), as supplemented by letters dated April 24, 2015, and April 29, 2015 (ADAMS Accession Nos. ML15114A480 and ML15120A406-nonproprietary, respectively), Duke Energy Progress, Inc. (the licensee), submitted Relief Request I3R-15, Revision 2, for the repair of degraded reactor vessel closure head penetration nozzle numbers 14, 18, and 23 for the Shearon Harris Nuclear Power Plant, Unit 1. In Relief Request I3R-15, Revision 2, the licensee proposed to use the inside diameter temper bead welding method to repair reactor vessel closure head nozzles in accordance with American Society of Mechanical Engineers (ASME) Code Cases N-638-1 and N-729-1 in lieu of requirements of the ASME, Sections III and XI, and original Construction Code.

The NRC staff reviewed the half nozzle repair procedures, including examinations; the evaluation of a postulated flaw in the J-groove weld that propagates into the reactor vessel head; the evaluation of a postulated flaw at the triple point; the evaluation of loose parts from the degraded J-groove weld falling into the reactor vessel; the corrosion evaluation of the bore of the reactor vessel head penetration exposing to primary coolant; available reinforcement area calculations; and the flaw evaluation of primary water stress corrosion cracking in the remnant nozzle, without considering the abrasive water jet machining remediation.

The NRC staff noted that the licensee derived a design life of 2.2 effective full power years for the repaired reactor vessel closure head nozzles without the abrasive water jet machining remediation. The licensee is required to examine all nozzles during every subsequent refueling outage, which is every 18 months, in accordance with ASME Code Case N-729-1 as conditioned in Title 10 of the *Code of Federal Regulations*, Part 50, Section 50.55a(g)(6)(ii)(D). The NRC staff finds that the licensee's examination frequency is sufficient to monitor the condition of repaired reactor vessel head penetration nozzle numbers 14, 18, and 23. The NRC staff further finds that the licensee's flaw evaluations provide assurance that should flaws occur, the structural integrity of the repaired nozzles and reactor vessel head will be maintained.

The NRC staff has determined that the proposed repair will restore the primary system pressure boundary and provide reasonable assurance that the structural integrity of the repaired reactor vessel closure head penetration nozzle numbers 14, 18, and 23 will be maintained for a period

of time that exceeds the inspection interval mandated by ASME Code Case N-729-1 as conditioned in 10 CFR 50.55a(g)(6)(ii)(D).

NRC Staff Conclusion Read by Benjamin Beasley, Deputy Director (Acting), Office of Nuclear Reactor Regulation

As Deputy Director of the Office of Nuclear Reactor Regulation, I concur with the Component Performance, Non-Destructive Examination, and Testing Branch's determinations.

The NRC staff concludes that Relief Request I3R-15, Revision 2, will provide an acceptable level of quality and safety for the repair of reactor vessel head penetration nozzle numbers 14, 18, and 23. Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(z)(1) and is in compliance with the requirements of the ASME Code, Section XI, ASME Code Case N-638-1 as conditioned in Regulatory Guide 1.147, and ASME Code Case N-729-1, as conditioned by 10 CFR 50.55a(g)(6)(ii)(D). Therefore, as of May 4, 2015, the NRC authorizes the use of Relief Request I3R-15, Revision 2, at Shearon Harris Nuclear Power Plant, Unit 1, for the remaining period of the third 10-year inservice inspection interval, which ends on May 1, 2017.

All other requirements of ASME Code, Section XI, and 10 CFR 50.55a(g)(6)(ii)(D) for which relief was not specifically requested and authorized by the NRC staff remain applicable, including the third party review by the Authorized Nuclear Inservice Inspector.

This verbal authorization does not preclude the NRC staff from asking additional clarification questions regarding Relief Request I3R-15, Revision 2, while preparing the subsequent written safety evaluation.