




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

April 30, 2018

MEMORANDUM TO: Brian W. Tindell, Acting Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

FROM: Martha Barillas, Project Manager 
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 I4R-18, FOR REACTOR
VESSEL CLOSURE HEAD PENETRATION NOZZLE REPAIR
TECHNIQUE, INSERVICE INSPECTION PROGRAM – FOURTH
10-YEAR INTERVAL (EPID L-2018-LLR-0053)

By letter dated April 18, 2018 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML18108A094), as supplemented by letter dated April 20, 2018 (ADAMS Accession Nos. ML18110A292), Duke Energy Progress, LLC (the licensee) submitted Relief Request I4R-18, Reactor Vessel Closure Head Nozzle Repair Technique, Inservice Inspection Program – Fourth 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 and examination requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) associated with Reactor Vessel Closure Head Penetration Nozzle Number 33.

The licensee proposed to use the alternatives in ASME Code, Section XI, Code Case N-638-6, "Similar and Dissimilar Metal Welding Using Ambient temperature Machine GTAW Temper Bead Technique," and Code Case N-729-4, "Alternative Examination Requirements for PWR [Pressurized-Water Reactor] Reactor Vessel Upper Heads With Nozzles Having Pressure-Retaining Partial-Penetration Welds Section XI, Division 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 April 26, 2018, the NRC staff granted a verbal authorization on the use of Relief Request I4R-18, in accordance with 10 CFR 50.55a(z)(1). The script for the verbal authorization is enclosed.

NRC Participants	Licensee Participants
B. Tindell	T. Hamilton
M. Barillas	S. McDaniel
J. Tsao	F. Dean
R. Davis	J. Terrell
S. Rose	K. Miller
A. Butcavage	H. Willetts

Docket No. 50-400

Enclosure:
Verbal Authorization Script

cc: Listserv

VERBAL AUTHORIZATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

FOR RELIEF REQUEST I4R-18

ALTERNATE REPAIR OF REACTOR VESSEL CLOSURE HEAD PENETRATION NOZZLE

DUKE ENERGY PROGRESS, LLC

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1

DOCKET NO. 50-400

1.0 Technical Evaluation Read by Robert Davis, Acting Chief of the Component Performance, Non-Destructive Examination, and Testing Branch, Office of Nuclear Reactor Regulation

By letter dated April 18, 2018 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML18108A094), as supplemented by letter dated April 20, 2018 (ADAMS Accession No. ML18110A292), Duke Energy Progress, Inc. (the licensee) requested relief from certain requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, related to the alternate repair of degraded reactor vessel closure head (RVCH) penetration Nozzle Number 33 at Shearon Harris Nuclear Power Plant, Unit 1 (Harris). The licensee submitted relief request I4R-18 for the alternate repair for the fourth 10-year Inservice Inspection interval, which is scheduled to end on September 8, 2027.

The licensee made this request in accordance with the requirements of 10 CFR 50.55a(z)(1) [Title 10, Code of Federal Regulations, Part 50, Section 55a(z)(1)] on the basis that the proposed alternative repair will provide an acceptable level of quality and safety.

In its submittal, the licensee proposed a repair method and examinations. The licensee submitted the following analyses in support of the proposed alternative: 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 exposed to primary coolant; available reinforcement area calculations; and the flaw evaluation of primary water stress corrosion cracking in the remnant nozzle.

The U. S. Nuclear Regulatory Commission (NRC) staff noted that the licensee's evaluation supports an inspection interval of 2.2 effective full-power years. However, the licensee is required to examine all nozzles, including Nozzle Number 33, during every subsequent refueling outage, which is every 18 months, in accordance with ASME Code Case N-729-4 as conditioned in Title 10 of the *Code of Federal Regulations*, Part 50, Section 55a(g)(6)(ii)(D). Given that the required inspection interval is less than the interval supported by the licensee's analyses, the NRC finds the licensee's proposed alternative and supporting analyses to be acceptable.

Enclosure

The NRC staff finds that the licensee's examination interval of the repaired nozzle is shorter than the design life, therefore, is acceptable to adequately monitor the condition of the repaired nozzle. The NRC staff further finds that the licensee's flaw evaluation provides assurance that should flaws occur, the structural integrity of the repaired nozzle and reactor vessel head will be maintained. The NRC staff determines 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 and repaired Nozzle Number 33 will be maintained for a period of time that exceeds the inspection interval mandated by ASME Code Case N-729-4 as conditioned in 10 CFR 50.55a(g)(6)(ii)(D).

2.0 NRC Staff Conclusion Read by Brian Tindell, Acting Branch Chief, Plant Licensing Branch II-2, Office of Nuclear Reactor Regulation

As Acting Chief of Plant Licensing Branch II-2, I concur with the Piping and Head Penetrations Branch's determinations.

The NRC staff concludes that Relief Request I4R-18 will provide an acceptable level of quality and safety for the reactor vessel head and repaired Nozzle Number 33. 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-638-6 as conditioned in Regulatory Guide 1.147, and ASME Code Case N-729-4, as conditioned by 10 CFR 50.55a(g)(6)(ii)(D). Therefore, as of April 26, 2018, the NRC authorizes the use of Relief Request I4R-18 for Nozzle Number 33 at Shearon Harris Nuclear Power Plant, Unit 1, for the remaining period of the fourth 10-year Inservice Inspection interval, which ends on September 8, 2027.

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 questions and clarifications regarding Relief Request I4R-18 while preparing the subsequent written safety evaluation.

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CLOSURE HEAD PENETRATION NOZZLE REPAIR TECHNIQUE, INSERVICE
INSPECTION PROGRAM – FOURTH 10-YEAR INTERVAL
(EPID L-2018-LLR-0053) DATED APRIL 30, 2018.

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