

**From:** Wengert, Thomas  
**Sent:** Wednesday, November 13, 2019 4:06 PM  
**To:** Arnold, Timothy  
**Cc:** BICE, DAVID B (ANO); Dixon-Herrity, Jennifer; Mitchell, Matthew; Taylor, Nick; Collins, Jay; Tsao, John; Braisted, Jonathan  
**Subject:** Arkansas Nuclear One, Unit 1 - Verbal Authorization of Relief Request ANO1-  
ISI-033 (EPID L-2019-LLR-0100)  
**Attachments:** Verbal Authorization for RR ANO1-ISI-033 dated 11-13-19.pdf

By telephone conversation on November 13, 2019, the U.S. Nuclear Regulatory Commission (NRC) staff provided a verbal authorization to Entergy Operations, Inc. (Entergy, the licensee) for the proposed alternative ANO1-ISI-033 to the requirements of Title 10 of the *Code of Federal Regulations* Part 50 (10 CFR 50) 55a(g)(6)(ii)(D), which requires American Society of Mechanical Engineer's Boiler and Pressure Vessel (ASME) Code Case N-729-4 for inspection of the reactor vessel closure head (RVCH) at Arkansas Nuclear One, Unit 1 (ANO-1). The licensee had submitted Relief Request ANO1-ISI-033 for NRC review and approval, proposing an alternative to perform a visual examination of the bare metal RVCH during the next refueling outage (1R29), in accordance with the latest revision of Code Case N-729 in 10 CFR 50.55a. The NRC staff's evaluation and verbal authorization is repeated in the attachment to this e-mail.

The following NRC and licensee personnel participated in the conference call:

#### NRC

Jennifer Dixon-Herrity - Chief, Plant Licensing Branch 4 (LPL4)  
Matthew Mitchell - Chief, Piping and Head Penetrations Branch (NPHP)  
Nick Taylor - Chief, Region 4, Engineering Branch 2  
Jay Collins – Senior Materials Engineer (NPHP)  
John Tsao – Senior Materials Engineer (NPHP)  
Jonathan Braisted – Senior Project Engineer, Region 4, Division of Reactor Projects, Branch D  
Tom Wengert - Project Manager (LPL4)

#### Entergy

Ron Gaston – Director, Regulatory Compliance  
Grant Flynn – Director, Engineering  
Brian Adkison – Supv Eng Programs  
Ryan (Andy) Nettles – ISI Engineer  
Andrew Osborn – Project Manager  
Dale Stringer – ISI contract  
Ken Panther – ISI contract  
Tim Arnold – Manager, Regulatory Assurance  
David Bice – Regulatory Assurance

Please contact me if you have any questions.

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VERBAL AUTHORIZATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELIEF REQUEST ANO1-ISI-033  
ALTERNATE EXAMINATION OF REACTOR VESSEL CLOSURE HEAD  
PENETRATION NOZZLES  
ARKANSAS NUCLEAR ONE, UNIT 1  
ENTERGY OPERATIONS, INC  
DOCKET NUMBER 50-313  
NOVEMBER 13, 2019

**Technical Evaluation read by Matthew Mitchell, Chief of the Piping and Head Penetrations Branch, Office of Nuclear Reactor Regulation**

By letter to the U.S. Nuclear Regulatory Commission [(NRC)] dated October 31, 2019 [(Agencywide Documents Access and Management System (ADAMS) Accession No. ML19304A290)], as supplemented by letter dated November 7, 2019 [(ADAMS Accession No. ML19311C822)], Entergy Operations, Inc. (the licensee) proposed alternative ANO1-ISI-033 to the requirements of Title 10 of the *Code of Federal Regulations* Part 50 (10 CFR 50) 55a(g)(6)(ii)(D), which requires American Society of Mechanical Engineer's Boiler and Pressure Vessel (ASME) Code Case N-729-4 for inspection of the reactor vessel closure head (RVCH) at Arkansas Nuclear One, Unit 1 (ANO-1). The licensee proposes this alternative during the current fall 2019 refueling outage. The licensee requested authorization of their proposed alternative under the requirements of 10 CFR 50.55a(z)(2) on the basis that compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

During the current outage at ANO-1 (1R28), the licensee performed a RVCH visual examination (VE). The licensee discovered that an Intermediate Cooling Water (ICW) system leak following refueling outage 1R27 left deposits on the RVCH which masked approximately half of the examination surface area of the RVCH. The licensee stated that the deposits around the nozzle penetrations limited the effectiveness of the VE for some nozzles. Therefore, the licensee proposed an alternative to perform a VE of the bare metal RVCH during the next refueling outage, 1R29, in accordance with the latest revision of Code Case N-729 in 10 CFR 50.55a. This was based on having completed a best effort VE of the RVCH this outage, taking chemistry samples of deposits on the RVCH to evaluate the source of the deposits, and performing a second VE after the RVCH had been cleaned to verify no corrosion on the RVCH.

The NRC staff reviewed photographs of leakage trails and confirmed that the deposits found on the RVCH could have been from the ICW system leak. Further, the NRC staff reviewed the chemistry sample analysis results and found that in the areas taken, the deposits are consistent with those found in the ICW system. The NRC staff also confirmed that the licensee has performed a second VE during the current refueling outage, which confirmed that there was no significant corrosion of the low alloy steel RVCH surface. While these actions were insufficient to disposition all the nozzles as being free from reactor coolant pressure boundary leakage, they support a conclusion that no significant degradation of the RVCH is likely to be currently occurring.

In addition, the NRC staff notes that the licensee's RVCH nozzles and attachment welds are fabricated from Alloy 690/52/152 materials, which are less susceptible to the initiation and growth of primary water stress corrosion cracking flaws. This contributes to the staff finding reasonable assurance that structural integrity of the RVCH will be maintained over the next operating cycle. The NRC staff then finds that the licensee's proposed alternative to perform a VE of the bare metal RVCH in accordance with N-729-4 during the next refueling outage will be able to either confirm no leakage from the reactor vessel pressure boundary is occurring or identify any possible leakage before it could challenge the structural integrity of the RVCH at ANO-1.

Without the proposed alternative, in accordance with ASME Code Case N-729-4, Paragraph 3142.1(c), the licensee would be required to perform supplemental volumetric and/or surface examinations to disposition any nozzles for which an absence of reactor coolant pressure boundary leakage had not been demonstrated. This activity would require additional work in a high radiation area that was not previously planned for this refueling outage. Therefore, the staff finds the licensee's identified hardship is acceptable, as required by 10 CFR 50.55a(z)(2).

Therefore, based on the above evaluation, the NRC staff finds that the licensee's proposed alternative meets the requirements for authorization under 10 CFR 50.55a(z)(2) and provides reasonable assurance of structural integrity of the RVCH at ANO-1 until the next refueling outage, 1R29.

**Authorization read by Jennifer Dixon-Herrity, Chief of Plant Licensing Branch IV, Office of Nuclear Reactor Regulation**

As Chief of Plant Licensing Branch IV, Office of Nuclear Reactor Regulation, I concur with the conclusions of the Piping and Head Penetrations Branch.

The NRC staff determines that the licensee has demonstrated that the proposed alternative in Relief Request ANO1-ISI-033 provides reasonable assurance of structural integrity of the subject components and that complying with the specified ASME Code requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. Accordingly, the NRC staff concludes that the licensee has adequately addressed the regulatory requirements set forth in 10 CFR 50.55a(z)(2). Therefore, on November 13, 2019, the NRC staff authorizes the use of Relief Request ANO1-ISI-033 at ANO-1 for one cycle of operation, until refueling outage 1R29, which is currently scheduled to complete in May 2021.

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

This verbal authorization does not preclude the NRC staff from requesting additional clarification information regarding the proposed alternative, while preparing the subsequent written safety evaluation.