

**From:** Sujata Goetz  
**Sent:** Tuesday, May 9, 2023 12:32 PM  
**To:** Lashley, Phil H  
**Cc:** Beck, Andrew; Sujata Goetz  
**Subject:** Beaver Valley Unit 2 - Verbal Authorization of Alternative Request, 2-TYP-4-RV-06 (EPID: L-2023-LLR-0021)  
**Attachments:** Final Beaver Valley U2 Verbal script .docx

Mr. Lashley,

In accordance with NRR Office Instruction LIC-102, "Review of Relief Requests, Proposed Alternatives, and Requests to Use Later Code Editions and Addenda," Agencywide Documents Access and Management System (ADAMS) Accession No. ML18351A218) the NRR staff has provided verbal authorization for Beaver Valley Power Station, Unit 2 to use proposed alternative, 2-TYP-4-RV-06, as described in Energy Harbor Nuclear Corp (Energy Harbor, the licensee) letter dated April 28, 2023 (ML23118A381). The proposed alternative, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(z)(2), requested to use an alternative to the requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Code Case N-638-10, "Similar and Dissimilar Metal Welding Using Ambient Temperature Machine GTAW [Gas Tungsten Arc Welding] Temper Bead Technique."

The script for the verbal authorization of the alternative request that was provided at approximately 1:30pm EDT on May 8, 2023, by Matthew Mitchell and Hipolito Gonzalez, is attached. As was communicated during the call, the NRC staff finds that the licensee's proposed alternative will provide an acceptable level of quality and safety in accordance with 10 CFR 50.55a(z)(2). Accordingly, the NRC staff concludes that the licensee has adequately addressed all the regulatory requirements set forth in 10 CFR 50.55a(z)(2). Therefore, as of May 8, 2023, the NRC authorizes the use proposed alternative, 2-TYP-4-RV-06.

This e-mail communication will be added to ADAMS as a publicly available official agency record, documenting the staff's approval. The NRC staff's formal safety evaluation will be transmitted via separate correspondence within approximately 150 days.

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

#### NRC

Sujata Goetz – Project Manager for Beaver Valley  
Hipolito Gonzalez – Chief, Plant Licensing Branch 1  
Matt Mitchell – Chief, Piping and Head Penetrations Branch  
Omar Kahn - Materials Engineer for Piping and Head Penetration Branch  
Matt Young – Chief, Region 1, Branch 2  
Andrey Turilin – Reactor Inspector, Engineering Branch 1  
Brian Towne - Senior Resident Inspector, Beaver Valley

#### Beaver Valley

Phil Lashley – Manager, Fleet Licensing  
Andrew Beck – Beaver Valley Fleet Licensing Representative  
Josh Goodman – Fleet Licensing

William Cothen – Director of Site Engineering  
Daniel Patten – Manager, Fleet Engineering  
Kevin Allen - Fleet Engineer  
Brandon Padgett – Programs Engineer  
Andrew Scott – Assistant. Nuclear Operations Shift Manager  
Julie Hartig - Supervisor, Nuclear Compliance  
Dave Barton - Fellow Welding Engineer at Westinghouse.

**Sujata Goetz**  
**Project Manager, Calvert Cliffs**

**Nuclear Regulatory Commission**  
**11555 Rockville Pike**  
**Office of the Nuclear Reactor Regulation**  
**NRC/NRR/DORL/LPL1**  
**Office O8F2**  
**Mailroom O8-B1A**  
**Rockville, MD 20852-2738**  
**Washington, DC 20555-0001**

**(o) 301.415.8004**  
**(f) 301.415.3313**

**Hearing Identifier:** NRR\_DRMA  
**Email Number:** 2085

**Mail Envelope Properties** (MN2PR09MB5467224781A6F797A56114A380769)

**Subject:** Beaver Valley Unit 2 - Verbal Authorization of Alternative Request,  
2-TYP-4-RV-06 (EPID L-2023-LLR-0021)  
**Sent Date:** 5/9/2023 12:32:04 PM  
**Received Date:** 5/9/2023 12:32:00 PM  
**From:** Sujata Goetz

**Created By:** Sujata.Goetz@nrc.gov

**Recipients:**

"Beck, Andrew" <abeck@energyharbor.com>  
Tracking Status: None  
"Sujata Goetz" <Sujata.Goetz@nrc.gov>  
Tracking Status: None  
"Lashley, Phil H" <phlashley@energyharbor.com>  
Tracking Status: None

**Post Office:** MN2PR09MB5467.namprd09.prod.outlook.com

<b>Files</b>	<b>Size</b>	<b>Date &amp; Time</b>
MESSAGE	2996	5/9/2023 12:32:00 PM
Final Beaver Valley U2 Verbal script .docx		35129

**Options**

**Priority:** Normal  
**Return Notification:** No  
**Reply Requested:** No  
**Sensitivity:** Normal  
**Expiration Date:**

VERBAL AUTHORIZATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

PROPOSED ALTERNATIVE 2-TYP-4-RV-06

ALTERNATIVE REPAIR METHODS FOR REACTOR VESSEL HEAD VENT

PENETRATION TUBE AND ASSOCIATED WELD

BEAVER VALLEY POWER STATION, UNIT NO. 2

ENERGY HARBOR NUCLEAR CORP.

DOCKET NO. 50-412

**Technical Evaluation read by Matthew Mitchell, Chief of the Piping and Head Penetrations Branch, Division of New and Renewed Licenses, NRR**

By letter dated April 28, 2023, (Agencywide Documents Access and Management System (ADAMS) Accession No. ML23118A381), and supplemented by letter dated May 5, 2023 (ML23125A290), Energy Harbor Nuclear Corp. (the licensee) requested an alternative to the requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Code Case N-638-10, "Similar and Dissimilar Metal Welding Using Ambient Temperature Machine GTAW [Gas Tungsten Arc Welding] Temper Bead Technique."

The licensee submitted a proposed alternative, 2-TYP-4-RV-06, for U.S. Nuclear Regulatory Commission (NRC) review and approval to support repair of two unacceptable flaw indications in the reactor vessel head (RVH) vent penetration tube material and associated weld at Beaver Valley Power Station, Unit No. 2 (BVPS2). The licensee stated that its repair will be in accordance with ASME Code, Section XI, IWA-4311 and ASME Code Case N-638-10, with two exceptions to N-638-10 to eliminate the 48 hour hold time for final examination after the completion of temper bead welding and to allow use of progressive liquid penetrant tests in lieu of volumetric examination. Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(z)(2), the licensee submitted the proposed alternative 2-TYP-4-RV-06 on the basis that complying with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. The licensee requested approval of this proposed alternative until the RVH is replaced.

During the spring 2023 refueling outage at Beaver Valley Unit 2, the licensee identified two unacceptable flaw indications in the head vent penetration tube material and its J-groove attachment weld. The licensee determined that the indications would be repaired in accordance with ASME Code Case N-638-10. However, the licensee identified that Code Case N-638-10, Section 4, paragraph (a)(2) requires that the austenitic weld shall be examined by volumetric and surface examination after three layers of temper bead welding have been in place for at least 48 hours. The licensee explained the hardship associated with this requirement was due to the limited geometry of the repair cavity. As such meaningful volumetric examination results could not be obtained and alternative methods, such as eddy current examination, were not readily available. The NRC staff finds the licensee's assessment of limited geometry meets the hardship requirement of 10 CFR 50.55a(z)(2).

The NRC staff reviewed the level of quality and safety of the licensee's proposed alternative. The NRC staff notes, as explained by the licensee, that the NRC has previously approved liquid penetrant examination in lieu of volumetric examination for temper bead welding applications (e.g., ML23073A156). NRC-approved 2019 Edition of ASME Code, Section III allows progressive surface examination for temper bead repairs to partial penetration welds in lieu of volumetric examination if meaningful results cannot be obtained. Therefore, the NRC staff finds the licensee's proposed alternative for progressive liquid penetrant tests in lieu of volumetric examination to be acceptable.

The NRC staff reviewed the licensee's technical justification to eliminate the 48 hour hold time when using austenitic filler materials in the temper bead welding process for P-1 and P-3 ferritic materials. The NRC staff found the licensee's basis for the proposed repair to be consistent with previous NRC approvals for the elimination of the 48 hour hold time (e.g., ML23090A130). The NRC staff is also unaware of any instances of hydrogen induced cracking, the primary concern for the 48 hour hold time, in the hundreds of welds that have been completed by the nuclear industry using various revisions of ASME Code Case N-638. Given this basis, the staff finds the elimination of the 48 hour hold time requirements of ASME Code Case N-638-10 to be acceptable.

The NRC staff reviewed the licensee's proposed future examinations of the vent line penetration nozzle and associated weld. The NRC staff finds the licensee's current understanding of the requirements to perform a surface examination of the head vent penetration inside diameter combined with a surface examination of the attaching J-groove weld adequate. Given these examinations, including the bare metal visual examinations of the RVH each refueling outage, the NRC staff finds reasonable assurance of the continued monitoring of the structural integrity of this component for the remaining life of the current RVH at BVPS2.

Based on the above evaluation, the NRC staff finds that the licensee's proposed alternative 2-TYP-4-RV-06 provides reasonable assurance of structural integrity of the RVH vent line and associated weld for the duration of the proposed alternative. Given the hardship, the NRC staff finds that the complying with the current volumetric examination requirement and 48 hour hold time requirement to be in compliance with ASME Code Case N-638-10 would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety in accordance with 10 CFR 50.55a(z)(2).

**Authorization read by Hipolito Gonzalez, Chief of Plant Licensing Branch I, Division of Operating Reactor Licensing, NRR**

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

As set forth above, the NRC staff has determined that complying with the specified requirements described in the licensee's request referenced above would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. The NRC staff finds that the proposed alternative provides reasonable assurance of structural integrity of the reactor vessel head vent line penetration nozzle and associated weld at BVPS2. Accordingly, the NRC staff concludes that the licensee has adequately addressed the regulatory requirements set forth in 10 CFR 50.55a(z)(2).

Therefore, effective May 8, 2023, the NRC staff authorizes the use of proposed alternative 2-TYP-4-RV-06 at BVPS2 for the for the remaining life of the reactor pressure vessel head.

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

This verbal authorization does not preclude the NRC staff from asking additional clarification question(s) regarding the proposed alternative while preparing the subsequent written safety evaluation.