



Orano TN
7160 Riverwood Drive
Suite 200
Columbia, MD 21046
USA
Tel: 410-910-6900
Fax: 434-260-8480

November 19, 2021
E-59930

U. S. Nuclear Regulatory Commission
Director of the Office of Nuclear Material Safety and Safeguards
Attn: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville, MD 20852

Subject: Response to Request for Additional Information - Proposed Alternative to the ASME Code, NG-4230 Tack Welds for Renewed Certificate of Compliance No. CoC 1004, Amendment Nos. 13, 14, 15, 16 and 17 (Docket No. 72-1004, CAC No. 001028, EPID:L-2021-LLR-0069)

Reference: Letter from Christian Jacobs (NRC) to Prakash Narayanan (TN Americas LLC), Proposed Alternative to the ASME Code, NG-4230 Tack Welds for Renewed Certificate of Compliance No. CoC 1004, Amendment Nos. 13, 14, 15, 16 and 17 (Docket No. 72-1004, CAC No. 001028, EPID:L-2021-LLR-0069) – Request for Additional Information, dated November 3, 2021

TN Americas LLC (TN) hereby submits our response to the Request for Additional Information (RAI) forwarded by the letter referenced above. Enclosure 1, herein, provides the responses to the RAI. Enclosure 2 provides an updated proposed code alternative table entry as a result of our RAI responses.

Should you have any questions regarding this submittal, please do not hesitate to contact Mr. Douglas Yates at 434-832-3101 or me at 410-910-6859.

Sincerely,

A handwritten signature in black ink that reads "A. Prakash" with a small "o" and "o" below the "sh".

Prakash Narayanan
Chief Technical Officer

cc: Christian Jacobs (NRC-DFM)

Enclosure 1: RAIs and Responses
Enclosure 2: Proposed Code Alternative Table Entry

Materials RAIs:**RAI-1:**

Provide additional information on how the mockup coupons will adequately represent the production welding set-up and how the applicant will account for variation in tack weld profiles, root opening, and defect orientation.

The applicant states that tack welds are used during fit-up and alignment of the welded components of the R45 transition rails and use of tack welds is standard practice for keeping parts closely together while completing the first pass or the root pass of a production weld. The NRC staff is unclear how the length of the Procedure Qualification Record (PQR) mockup coupons with respect to length of the actual transition rail component will adequately represent production welding (i.e., number of tack welds, size of tack welds, and gap between the tack welds.)

The applicant states that three coupons will be produced for each joint geometry to account for variations in joint design and a tack will be broken to prepare the coupon for PQR. Since the tacks weld are made manually, there will be variation in the tack welds from welder to welder. In addition, there will be variations in the defect orientations. The staff is unclear how the applicant will account for these variations in their mockup coupons.

The applicant states that an additional PQR shall be prepared in accordance with ASME Section IX with coupons that were produced with three broken tack welds per coupon at fit-up. The staff is unclear about the intent of this PQR and its applicability.

This information is needed to determine if it meets the requirements of Part 72 of Title 10 of the *Code of Federal Regulations* (10 CFR) 72.236(b) and 72.158.

Response to RAI-1:

The intent of introducing defective tack welds in PQR coupons is to demonstrate that the mechanical strength of the welding process continues to be acceptable by destructively testing the coupons per American Society of Mechanical Engineers (ASME) Section IX requirements. TN Americas LLC (TN) does not see the need to complete a mockup that is the full length of the R45 transition rail, as there is no practical means to destructively test a full length R45 transition rail. For this reason, TN is proposing to mechanically test coupons.

The NRC is correct that variation exists from welder to welder, and the tack welds will have some variation. However, TN believes that simulating a fully broken tack weld will provide the bounding defect for the welding process to repair during the root pass. The welding process must demonstrate that it has sufficient depth of penetration to re-fuse through the entire tack, and thus any variation in how each welder's tack weld may contain defects will not challenge the demonstration.

TN is proposing to use the standard qualification requirements from ASME Section IX for establishing the testing requirements of the coupons with broken tack welds. The intent of these PQRs is to establish and qualify the controlling parameters of the Welding Procedure Specification (WPS) that ensure the acceptable mechanical properties are met during production welding.

Impact:

No change as a result of this RAI.

RAI-2:

Please provide additional information on the process of addressing defective tack welds for removal or repair.

The applicant states that defective tack welds shall either be removed or repaired in the process of fit-up and alignment. The staff is unclear if repairs are done by manual tack welding independent of the automated welding or mechanized welding process.

In addition, the staff is unclear how the defective tack welds are tracked for removal or repair, and the process that is followed to address the defective tack welds before the component is deemed ready for the root/first pass using an automated/mechanized welding process. A defect found by a qualified visual inspector is generally tracked and reexamined post removal and/or repair. Such repairs may be documented, and that area of the weld should be scrutinized with additional nondestructive examination (NDE) after the final weld is completed.

This information is needed to determine if it meets the requirements of 10 CFR 72.236(b) and 72.158.

Response to RAI-2:

In the context of this request for R45 transition rails, currently the tack welds are made by a manual process only. TN believes that any future fabricators of the R45 transition rails would also use a manual process for tack welding the parts together. The ASME code does not prohibit tack welding by an automated or mechanized welding system, but from a practicality standpoint tack welding is typically performed by a manual process.

Travelers (work instructions) for the manufacturing of the R45 transition rails have an operation for a qualified inspector to perform the visual test (VT) of the tack welds prior to the start of the root pass by the operator. The qualified inspector is required to issue a VT report to document the results of the inspection. The inspector generates a nonconformance report (NCR) for defective tack welds and the condition is processed in accordance with TN's control of nonconforming condition procedures. The weld operator is not permitted to start the root pass until the NCR is closed and the inspector has closed the preceding operation of the traveler.

Impact:

No change as a result of this RAI.

RAI-3:

Please provide additional details for the acceptance criteria for the visual examination to be performed by the welder and or welding supervisor. In addition, please provide additional details on how the visual inspection of the welds will be documented.

The applicant proposed alternative allows a non-qualified inspector (welder or weld supervisor) to check the tack welds for defects. However, it is unclear what acceptance criteria will be used for this visual examination. In addition, it is unclear if inspection of the welds will be documented to verify quality.

This information is needed to determine if it meets the requirements of 10 CFR 72.236(b), 72.158, and 72.168.

Response to RAI-3:

The acceptance criteria used by the welder and/or welding supervisor would be the same. Paragraph NG-4231.1 requires tack welds to be visually examined in accordance with NG-5261 and defective tack welds to be removed. Paragraph NG-5361 provides acceptance standards (a) and (b) shown below.

- (a) Weld reinforcement, underfill, undercut, and overlap shall not exceed the allowable limits of this Subsection.
- (b) The examined surface shall be free of abrupt irregularities.

The acceptance of the tack welds by the welder and/or welding supervisor shall be documented by the completion of an operation in the manufacturing traveler. No visual testing (VT) report will be generated.

Impact:

The Proposed Code Alternative Table Entry has been updated as a result of this RAI. The first sentence in the 2nd paragraph of the last column has been clarified regarding omitting the use of a qualified inspector. Additional requirements item 1 was also revised to refer to NG-4231.1.

RAI-4:

Please provide additional information to add clarity for the applicability for NB-4123 and NB-4423.

Applicant's request for a code alternative pertains to subsection NG. In Subsection NG, NG-4123 and NG-4423 are similar to NB-4123 and NB-4423 respectively. The staff is unclear the applicability of the reference to NB-4123 and NB-4423.

This information is needed to determine if it meets the requirements of 10 CFR 72.236(b).

Response to RAI-4:

TN's intent of citing NB-4123 and NB-4423 was to show that portions of the ASME code have already eliminated the need for qualified inspectors performing VT examinations of tack welds. The paragraphs have no applicability to the R45 transition rails, as the R45 transition rails are classified as NG components. The information was provided to justify the code alternative only.

Impact:

No change as a result of this RAI.

Proposed Code Alternative Table Entry

Reference ASME Code Section/Article	Code Requirement	Alternatives, Justification and Compensatory Measures
NG-4231.1	<p><i>Tack welds used to secure alignment shall either be removed completely, when they have served their purpose, or their stopping and starting ends shall be properly prepared by grinding or other suitable means so that they may be satisfactorily incorporated into the final weld. Tacks welds shall be made by qualified welders using qualified welding procedures. When tack welds are to become part of finished weld, they shall be visually examined in accordance with NG-5261 and defective tack welds shall be removed</i></p>	<p>Along with the option to full comply with NG-4231.1, if practicable, the proposed alternative option to Paragraph NG-4231.1 is as follows:</p> <p>The use of a qualified inspector to perform the VT examination required by NG-4231.1 may be omitted for the welds of R45 Transition Rails of the NUHOMS® 61BTH Type 2 DSC when the following additional requirements are met:</p> <ol style="list-style-type: none"> 1. The welder or weld supervisor shall check the tack welds for defects per NG-4231.1 and shall either remove or repair the defective tack welds in the process of fit-up and alignment. 2. The welding procedure specification (WPS) and procedure qualification record (PQR) of the production welds shall contain the following additional qualification requirements for each joint geometry: <ol style="list-style-type: none"> A. Three coupons shall be prepared that simulate the joint geometry that will be used in production. A tack weld shall be completed and broken. B. The weld shall be completed with parameters that result in the minimum weld filler deposition rate allowed by the WPS. C. The coupons shall be cross-sectioned, etched, and verified under magnification that the weld has satisfactorily incorporated the tack weld and the defect has been removed. 3. An additional PQR shall be prepared in accordance with ASME Section IX with coupons that were produced with three broken tack welds per coupon at fit-up. The coupons shall pass all applicable testing requirements of ASME Section IX. 4. Production welds shall be made by either an automated welding or mechanized welding process. Only the tack weld may be completed by a manual process.