Date Distributed: January 5, 2022

THE NATIONAL BOARD
OF BOILER AND PRESSURE VESSEL INSPECTORS

NATIONAL BOARD INSPECTION CODE SUBCOMMITTEE REPAIRS & ALTERATIONS

AGENDA

Meeting of January 19th, 2022
San Diego, CA

The National Board of Boiler & Pressure Vessel Inspectors 1055 Crupper Avenue
Columbus, Ohio 43229-1183
Phone: (614)888-8320
FAX: (614)847-1828

1. **Call to Order**
   8:00 AM Pacific Time. For those attending in person, the meeting will be held in Versailles Ballroom on the second floor of the hotel.

2. **Introduction of Members and Visitors**

3. **Check for a Quorum**

4. **Awards/Special Recognition**

5. **Announcements**
   - The National Board will be hosting a reception on Wednesday evening from 5:30pm to 7:30pm at The Smoking Gun.

   - The National Board will be hosting breakfast and lunch on Thursday. Breakfast will be served from 7:00am to 8:00am, and lunch will be served from 11:30am to 12:30pm. Both meals will be served at the hotel in Le Fontainebleau.

   - A coffee station will be provided outside of the meeting rooms on each floor.

6. **Adoption of the Agenda**

7. **Approval of the Minutes of the July 14th, 2021 Meeting**
   The minutes are available for review on the National Board website, www.nationalboard.org.

8. **Review of Rosters (Attachment 1)**
   a. **Membership Nominations**
      i. Mr. Raymond Spuhl would like to be considered for Subgroup R&A membership/ He is currently a member of the NR Task Group.

   b. **Membership Reappointments**
      i. The following Subcommittee R&A memberships will expire prior to the July 2022 NBIC meeting: Mr. Craig Hopkins, Mr. Linn Moedinger, Mr. Ben Schaefer.

   c. **Officer Nominations**

9. Errata

NBIC Location of Error: Part 3, Table 2.3	**Attachment Page 2**
General Description: Inadvertent omission of two SWPSs in 2021 NBIC Part 3, Table 2.3 **Task Group:** T. Hellman **Explanation of Need:** During the publication process, the SWPSs B2.1-1-207 and B2.1-1/8-228 were deleted from the table. Both SWPSs should still be in Table 2.3 as none of the approved Table 2.3 action items for the 2021 NBIC removed these SWPSs. **January 2022 Meeting Action:**	

10. Interpretations

Item Number: 20-78	**NBIC Location: Part 3, 3.3.3 s) & 3.4.4 d)**	**No Attachment**
General Description: Repairs and Alterations of Tube Bundles **Subgroup:** Repairs and Alterations **Task Group:** Paul Shanks **Explanation of Need:** Submission is for R Certificate Holders we provide Repair Inspection services for. NBIC Part 3, 3.3.3 s) seems to allow to be a repair, but under 3.4.4 d) where the dimensions change it might be classified as an alteration.) **INT TG Action:** Progress Report – Discussion of this Item (20-78) and Item 20-54 dealing with 3.4 .4 d) resulted in P. Becker opening a new Item (21-12) to better clarify the definition and examples of "Repairs" and "Alterations" **SC ACTION:** Mr. Shanks presented a **Progress Report**. **July INT TG Action:** P. Shanks presented that this is still being held back. Progress Report till 21-12 is resolved. **Meeting Action:** P. Shanks presented that this is still being held back. **Progress Report** till 21-12 is resolved.		

Item Number: 21-28	NBIC Location: Part 3, 1.5.1 & 3.3.3 c)	No Attachment

General Description: Subcontracted Weld-Overlay Repair

Subgroup: Repairs and Alterations

Task Group: Walter Sperko

Explanation of Need:
(1) To clarify whether it is permitted for an "R" Certificate of Authorization Holder to subcontract weld-overlay repair to another company who does not possess an "R" Certificate.
(2) To clarify whether a subcontractor's shop used on a regular basis may be considered as a field location to allow welding by and under the control of the "R" Certificate Holder at that shop.

Meeting Action: Trevor Seime presented a **PR**

Item Number: 21-32	NBIC Location: Part 3, 4.2	No Attachment

General Description: NDE requirements when repairing defects in original weld metal

Subgroup: Repairs and Alterations

Task Group: R. Troutt (PM), M. Toth

Explanation of Need:
This provision will help clarify to "R" Stamp Certificate holders and owners of pressure vessels that are in need of minor repairs to existing welds. Due to the ambiguous wording of this clause any welding on a head to shell joint may be interpreted to require volumetric inspection when the name plate is stamped RT4.

July INT TG Action: R. Troutt presented – R. Underwood's submitted comment and P. Shanks discussion was considered. Proposal revised and unanimously approved.

Meeting Action: R. Troutt presented, but after much discussion Marty Toth was added to the TG, but the proposal was to be taken back for more work. This was a **PR**.

New Interpretation Requests:

Item Number: 21-39	NBIC Location: Part 3, 3.3.2 e)	Attachment Page 3

General Description: Routine repair scope

Subgroup: Repairs and Alterations

Task Group: None assigned

Explanation of Need:
Some R-certificate holders and AIAs are making huge (100 square feet) weld metal buildup type routine repairs on the basis that the components being built up are only 5" tubes and 3.3.2 e) 1) says welded repairs to 5" tubes are routine. As 3.3.2 e) includes "shall be limited to" shouldn't exceeding any one of the listed limitations preclude the routine repair approach.

January 2022 Meeting Action:

Item Number: 21-57	NBIC Location: Part 3, 3.3.2 a)	Attachment Page 4

General Description: Routine Repairs of Section VIII Div 1 built to Appdx 46

Subgroup: Repairs and Alterations

Task Group: T. Seime (PM)

Explanation of Need:
Routine Repairs are not allowed for ASME Sect. VIII Div. 2 or 3 vessels. Routine Repairs should not be allowed for Div. 1 vessels built using the design considerations of Division 2 to establish the thickness and other design details of a component for a Section VIII, Division 1 pressure vessel.

January 2022 Meeting Action:

Item Number: 21-60	NBIC Location: Part 3, 3.4.5.1 b)	Attachment Page 5

General Description: UDS requirements for repairs and alterations for Divisions 2 & 3

Subgroup: Repairs and Alterations

Task Group: G. Galanes (PM)

Explanation of Need:
Is it the intent of interpretation 19-14 to prohibit the R-Certificate holder from recreating a UDS while still allowing the user to create the UDS? If yes, could the R-Certificate holder serve as the user's designated agent to recreate the UDS? Although this interpretation applies specifically to alterations, would this interpretation also be applicable to performing repairs (see 3.3.5.2(a))?

January 2022 Meeting Action:

Item Number: 21-64	NBIC Location: Part 3, 1.3.1	Attachment Page 6

General Description: Repair or Alteration activity allowed prior to Certification

Subgroup: Repairs and Alterations

Task Group: M. Toth (PM)

Explanation of Need:
Applicants for the "R" Certificate are unclear if the NBIC allows for any activities to be performed prior to certification, especially since ASME does allow it.

January 2022 Meeting Action:

Item Number: 21-74	NBIC Location: Part 3, 1.3.1	Attachment Page 7

General Description: ASME Sect VIII, Div 1 Design Personnel Requirements and NBIC Repairs/Alts

Subgroup: Repairs and Alterations

Task Group: T. McBee (PM)

Explanation of Need:
Many have asked what, if any, impact the new ASME VIII-1 Appendix 47 design personnel requirements will have on NBIC repairs and alterations.

January 2022 Meeting Action:

Item Number: 21-75	NBIC Location: Part 3, 3.3.2 e) 1)	Attachment Page 8

General Description: Routine Repairs

Subgroup: Repairs and Alterations

Task Group: None assigned

Explanation of Need:
The wording "but does not include nozzles to pressure-retaining items" could lead into interpreting the nozzle as a whole including the joint attaching the nozzle to the PRI.

January 2022 Meeting Action:

Item Number: 21-79	NBIC Location: Part 3, 3.3.3 h)	Attachment Page 9

General Description: Mechanical Replacement of Shell or Head

Subgroup: Repairs and Alterations

Task Group: None assigned

Explanation of Need:
This interpretation and corresponding Code revision would provide clarity to NBIC users and address whether mechanical replacement of these components is considered a repair.

January 2022 Meeting Action:

Item Number: 21-81	NBIC Location: Part 3, 3.3.6	Attachment Page 10

General Description: Repairs/Alterations of Impact Tested Vessels (Intent Interp)

Subgroup: Repairs and Alterations

Task Group: None assigned

Explanation of Need:
There is an urgent need to address these concerns as the repair firms cannot comply with the existing wording in 3.3.6. The purpose of this Intent Interpretation is to take the approved revisions to the 2023 NBIC Part 3 and provide immediate guidance to users involved in the repair and alteration activities of impact tested vessels.

January 2022 Meeting Action:

11. Action Items

a. Task Group Graphite

Item Number: NB15-2208	NBIC Location: Part 3	No Attachment

General Description: Develop supplement for repairs and alterations based on international construction standards

Subgroup: Graphite
Task Group: Greg Becherer (PM)

Meeting Action: No members of the Graphite Task Group were present to discuss the item. This was a **Progress Report**. If no members of the Graphite TG attend the next meeting, this Item will be Closed with No Action.

Meeting Action: PR - The Graphite Task Group is still developing a proposal for this item.

Item Number: 17-167	NBIC Location: Part 3, S3.2 d)	No Attachment

General Description: Clarify repair inspection requirements for machined only graphite parts.

Subgroup: Graphite
Task Group: Aaron Viet (PM)

Meeting Action: No members of the Graphite Task Group were present to discuss the item. This was a **Progress Report**. If no members of the Graphite TG attend the next meeting, this Item will be Closed with No Action.

Meeting Action: PR - The Graphite Task Group is still developing a proposal for this item.

Item Number: 18-94	NBIC Location: Part 3, S3.2 f), h); S3.4 a), b), c) etc.	No Attachment

General Description: G-mark Requirements for Various Repairs/Alteration to Graphite

Subgroup: Graphite

Task Group: C. Cary (PM)

Meeting Action: No members of the Graphite Task Group were present to discuss the item. This was a **Progress Report**. If no members of the Graphite TG attend the next meeting, this Item will be Closed with No Action.

Meeting Action: PR - The Graphite Task Group is still developing a proposal for this item.

Item Number: 19-73	NBIC Location: Part 3, S3	No Attachment

General Description: Requirements for who can make hole plugging repairs on graphite blocks

Subgroup: Graphite

Task Group: C. Cary (PM), A. Viet, A. Stupica

Explanation of Need: Performing hole plugging repairs in graphite blocks is a common repair for graphite pressure vessels, but the NBIC currently has no formal requirements for this type of repair.

Meeting Action: No members of the Graphite Task Group were present to discuss the item. This was a **Progress Report**. If no members of the Graphite TG attend the next meeting, this Item will be Closed with No Action.

Meeting Action: PR - The Graphite Task Group is still developing a proposal for this item.

Item Number: 19-74	NBIC Location: Part 3, S3.3	No Attachment

General Description: Routine repair requirements for partial nozzle replacement

Subgroup: Graphite

Task Group: A. Stupica (PM), M. Bost

Explanation of Need: Currently only nozzle replacement is addressed as a routine repair. The group is planning on defining the types of partial nozzle replacements and repairs that could be defined as routine.

Meeting Action: No members of the Graphite Task Group were present to discuss the item. This was a **Progress Report**. If no members of the Graphite TG attend the next meeting, this Item will be Closed with No Action.

Meeting Action: PR - The Graphite Task Group is still developing a proposal for this item.

Item Number: 19-79	NBIC Location: Part 3, S3.5.4 h)	No Attachment

General Description: Re-word Part 3, S3.5.4 h) to clarify cementing procedure for plugs

Subgroup: Graphite

Task Group: A. Stupica (PM)

Explanation of Need: Existing language includes unnecessary steps and is clunky to read. Text will be reworded to clarify the full procedure.

Meeting Action: No members of the Graphite Task Group were present to discuss the item. This was a **Progress Report**. If no members of the Graphite TG attend the next meeting, this Item will be Closed with No Action.

Meeting Action: PR - The Graphite Task Group is still developing a proposal for this item.

b. Task Group FRP

There are currently no open FRP items related to Part 3.

c. Task Group Historical

Item Number: 20-25	NBIC Location: Part 3, S2.13	No Attachment

General Description: Repair Procedure for Fire Boxes

Subgroup: SG Historical

Task Group: M. Wahl (PM), Robin Forbes, T. Dillon, & F. Johnson

Explanation of Need: In NBIC Part 3, S2.13.10.3, S2.13.11 do not define what to do at a riveted joint. On the tubesheet, or firedoor sheet, where it is flanged to rivet to the firebox, the repairs are silent on what to do at the riveted joint.

SC ACTION: Mr. Moedinger presented this item is related to Item 20-69. This was a **Progress Report**.

July SG Historical Meeting Action: Progress Report: Now that the item has passed through TG Locomotive, SC R & A, and MC, the TG Historical needs to see how they want to proceed. The TG will work on this item to create a proposal for the January 2022 meeting.

Item Number: 21-09	NBIC Location: Part 3, S2	No Attachment

General Description: Incorporate new repair methods for through and diagonal stays

Subgroup: Historical

Task Group: D. Rose (PM), R. Bryce, R. Forbes, C. Jowett

Explanation of Need: The code is silent on the inspection of through stays and diagonal stays. Additionally new repair methods are available from ASME that can be incorporated.

Historical TG Meeting Action: Progress Report: Mr. Rose stated he is still working on a proposal to show to the group.

Item Number: 21-78	NBIC Location: Part 2, S2.13.9.5 e)	Attachment Page 11

General Description: Alternative Weld Joint For Historical Boiler Barrel Replacement

Subgroup: Historical
Task Group: None assigned

Background: Historical boilers were manufactured with riveted joints, however in many cases it's more practical to use welded joints when restoring historical boilers. However, ASME Section I does not allow fillet welded lap joints when connecting replacement barrels to the wrapper sheet. The strength of a double fillet welded lap joint has proven to be equal, if not greater in strength than riveted joint designs and this proposal will introduce this type of joint as an alternative to riveted lap joints.

January 2022 Action:

d. Task Group Locomotive

Item Number: 21-35	NBIC Location: Part 3, S1.1.3.1	Attachment Page 12

General Description: Part 3, Table S1.1.3.1, Threaded Staybolts and Patch Bolts is incorrect

Subgroup: Locomotive

Task Group: L. Moedinger (PM)

Explanation of Need: The wording in the 2017 NBIC was "Threaded Staybolts and Patch Bolts SA-31 Grade A SA-675 with a tensile strength of 47,000 psi to 65,000 psi inclusive" A change was made for the 2019 Edition to reflect the grades rather than tensile strength. Somehow the wrong grades were used and this was not caught until now.

January 2022 Meeting Action:

Update: This item is currently being balloted to SC R&A.

e. Subgroup Repairs & Alterations

Item Number: 17-134	NBIC Location: Part 3, Section 5	No Attachment

General Description: Proposed Revision for registration of Form R-1 with the National Board containing ASME pressure part data reports attached.

Subgroup: Repairs and Alterations
Task Group: P. Shanks (PM), Rob Troutt, Joel Amato, Kathy Moore, Paul Edwards

July 2020 Meeting Action: Mr. P. Shanks presented a Progress Report.

SG R&A Action: Progress Report

SC ACTION: Mr. Shanks presented a **Progress Report.**

Meeting Action: Paul Shanks proposed that this item be **Closed w/No Action** (Closed w/NA). The proposal was motioned, seconded, and unanimously approved.

Item Number: 19-60	NBIC Location: Part 3, 1.5.1	Attachment 13

General Description: Quality System For Qualification For The National Board "R" Certificate

Subgroup: Repairs and Alterations
Task Group: K. Moore (PM), Paul Davis, B. Boseo, M. Toth, P. Shanks, M. Quisenberry, R. Sturm, T. Seime

Explanation of Need: Part 3, 1.5.1 provides a good outline for a Quality Systems Manual. However, the remaining elements of a Quality System, outside of the one's currently being addressed in Item 19- 47 and 19-4 need to be embellished to provide a more auditable description of each element.

July 2020 Meeting Action: Ms. K. Moore presented a **Progress Report**.

SG R&A Action: Item 20-68 (Certifications) was incorporated into this Item (19-60) and is to be Closed w/No Action. Item 20-92 (Mech. Assembly vs Repair procedures) was added to this Item (19-60) and Closed w/No Action.

SC ACTION: K. Moore presented a **Progress Report**.

Update: This item was approved by Subcommittee R&A by letter ballot 05/21/21 (14-0).

Meeting Action: K. Moore presented. Mr. J. Sekely pointed out that comments made on the last version submitted via LB were not addressed on the current proposal. The item was taken back to make the appropriate revisions. **This was a PR.**

Update: This item is currently being balloted to SC R&A.

Item Number: 19-61	NBIC Location: Part 3, 3.3.4	No Attachment

General Description: Threaded Inserts as Alterations Example

Subgroup: Repairs and Alterations

Task Group: Paul Shanks (PM), J. Walker, T. McBee

Explanation of Need: Threaded insert are being used to fix a bolt that has broken off on certain types of boilers (autoclaves) which hold the heating elements in the water side of the boiler. When this happens, the technician correcting the problem will simply drill out the broken bolt with an over sized bit and inset a metallic insert. NBIC does address this this type of alteration.

SG R&A Action: Progress Report
SC ACTION: Mr. Shanks presented a Progress Report.

Meeting Action: Mr. Shanks presented a **Progress Report**.

Item Number: 20-48	**NBIC Location: Part 3, 1.6**	**No Attachment**

General Description: Review NR Program (1.6) to 2015 NQA-1 Edition

Subgroup: Repairs and Alterations

Task Group: P. Edwards (PM)

Explanation of Need: Latest NQA-1 revision to be compared to NR program (1.6) for consistency.

SG R&A Action: Progress Report

SC ACTION: Mr. Edwards presented a **Progress Report.**

Meeting Action: Mr. Edwards presented a **Progress Report.**

Item Number: 20-52	**NBIC Location: Part 3, 1.6.2 a) 2)**	**No Attachment**

General Description: Rvw NR requirements for ASME Section XI Div. 2 potential applications

Subgroup: Repairs and Alterations

Task Group: T. Roberts (PM), P. Edwards

Explanation of Need: This was created based on discussion from Item 20-47 dealing with ANIA requirements.
SG R&A Action: Progress Report

SC ACTION: Mr. Edwards presented a **Progress Report.**

Meeting Action: Mr. Edwards presented a **Progress Report.**

Item Number: 20-53	**NBIC Location: Part 3, 3.3.5.2 a) & 3.4.5.1 b)**	**No Attachment**

General Description: Certification of Repair or Alteration Plans

Subgroup: Repairs and Alterations

Task Group: S. Chestnut (PM)

Explanation of Need: The Clarification of the Certifying Engineer requirements.
SG R&A Action: Progress Report

SC ACTION: Mr. Chestnut presented a **Progress Report**.

Meeting Action: Scott Chestnut presented a **Progress Report** – Ben Schaefer volunteered forTG. During discussion, B. Underwood stated the 2021 ASME Sect. VIII may address this.

Item Number: 20-60	NBIC Location: Part 3, 3.3.4.8	No Attachment

General Description: Part 3 Supplement for FFS Guidelines

Subgroup: Repairs and Alterations

Task Group: J. Siefert (PM)

Explanation of Need: The NBIC provides little guidance related to FFS activities and repairs in part 3.

SG R&A Action: Progress Report

SC ACTION: Mr. Siefer presented that EPRI will be drafting a FFS Supplement for consideration in the future. This was a **Progress Report**.

Meeting Action: Mr. Siefert presented that EPRI will be drafting a FFS Supplement for consideration in the future. This was a **Progress Report**.

Item Number: 20-67	NBIC Location: Part 3, S6	No Attachment

General Description: Revisions to Part 3, Supplement 6

Subgroup: Repairs and Alterations

Task Group: R. Underwood (PM), T. McBee, G. Galanes

Explanation of Need: Supplement 6 was implemented into the 2007 Edition of the NBIC Part 3 to provide requirements and guidelines for repairs, alterations and modifications to DOT Transport Tanks using the National Board's "TR" Program (which was never implemented). S6 has been revised over the years to remove reference to the "TR" Program, but still contains many requirements that are not correct. This purpose of this proposal is to review the entire Supplement and make appropriate revisions that comply with NBIC Part 3 and DOT requirements.

SG R&A Action: Progress Report

SC ACTION: Mr. Underwood presented a **Progress Report.**

July SG R&A Meeting Action: Mr. Underwood presented a Progress Report.

Meeting Action: Mr. Underwood presented a **Progress Report**.

Item Number: 20-73	NBIC Location: Part 3, 4.4.2 a) 2)	No Attachment

General Description: Pressure Testing of Connecting Welds (Part 3, 4.4.2(a)(2)

Subgroup: Repairs and Alterations

Task Group: R. Underwood (PM)

Explanation of Need: To clarify what the term "replacement part" as used in 4.4.2(a)(2) of Part 3 means.

SG R&A Action: The proposal was revised and Unanimously Approved.

SC ACTION: Mr. Underwood presented a proposal which was motioned, seconded and **Unanimously Approved.**

Update: At the Jan 2021 meeting, Main Committee requested that the task group take the proposal back for further work.

July SG R&A Meeting Action: B. Underwood – PR – Waiting on related Item 21-12 outcome

Meeting Action: B. Underwood presented a **PR**, as he is waiting on related Item 21-12 outcome which may address this revision.

Item Number: 20-83	NBIC Location: Part 3, 1.5.1 s) & 9.1	Attachment 20

General Description: Revision to Part 3, 3.2.2 e)

Subgroup: Repairs and Alterations

Task Group: T. Hellman

Explanation of Need: Action Item 19-60 is proposing revisions/additions to all of 1.5.1. This proposal is to move the definition of "Nonconformance" out of the current 1.5.1 s) paragraph and into the glossary.

SG R&A Action: The proposal was Unanimously Approved and will be sent to Parts 1, 2, 3, and 4 SC as a Rvw and Comment LB
SC ACTION: Mr. Hellman presented and motioned for the proposal **to be sent to all SC (Parts 1, 2, 3, and 4) as a Rvw and Comment LB**. The motion was Unanimously Approved.

Update: SC R&A (8-0) and MC (7-0) Rvw and Comment LB in progress till 07/06

July SG R&A Meeting Action: T. Hellman presented a proposal that was unanimously approved.

Meeting Action: T. Hellman presented a proposal to go to a **Review and Comment LB to all SC (Parts 1-4) and Main Committee**.

Update: The proposal was balloted to SC R&A, PRD, and Installation. The ballot passed Installation and R&A but failed PRD. IT is currently being balloted to Inspection.

Item Number: 21-02	NBIC Location: Part 3, 1.6	No Attachment

General Description: Define "Fuel Loading" as it pertains to NR activities

Subgroup: Repairs and Alterations

Task Group: P. Edwards (PM)

Explanation of Need: The NR TG would like to clarify "Fuel Loading" as used to determine Category 1, 2 or 3 NR activities.

Meeting Action: P. Edwards - PR

Item Number: 21-10	NBIC Location: Part 3, 5.2 &5.4	Attachment 22

General Description: Add a time frame for R forms (for completion of and submittal of forms)

Subgroup: Repairs and Alterations

Task Group: D. Kinney (PM), B. Schaefer, B. McGuire

Explanation of Need: Currently, the NBIC is silent on how much time may go by after work is completed before the applicable R Form is accepted by the inspector after work is completed. The NBIC is also silent on how much time may go by before the applicable R Form is submitted to the NB and Jurisdictions (as applicable).

SG R&A Action: Progress Report – waiting to see outcome of Item 20-15 for Routine Repair stamping

SC ACTION: Mr. Troutt presented a **Progress Report.**

July SG R&A Meeting Action – New TG: D. Kinney (PM), B. Schaefer, B. McGuire, - this was a PR

Meeting Action – With Mr. Troutt stepping down from the SG R&A, a new TG for this item was established with the following volunteers: D. Kinney (PM), B. Schaefer, B. McGuire, - this was a **PR.**

Item Number: 21-06	NBIC Location: Part 3, 4.4.2	No Attachment

General Description: Concessions with pressure testing associated with replacement parts

Subgroup: Repairs and Alterations

Task Group: D. Kinney (PM), R. Miletti, P. Becker, P. Davis, R. Underwood, M. Winters

Explanation of Need: When replacement parts are manufactured and not tested as required by the original code of construction, there needs to be concessions or considerations associated with the pressure testing requirements as to not detrimentally effect the existing pressure retaining item.

Meeting Action: D. Kinney presented - T. Sieme and B. Wielgozinski had several comments and volunteered to join the TG. After discusstion, Mr. Kinney pulled the proposal back for more work. This was a PR

Item Number: 21-07	NBIC Location: Part 3, 1.3.2 a)	Attachment 21

General Description: NBIC Report Form certification clarification.

Subgroup: Repairs and Alterations

Task Group: D. Kinney (PM)

Explanation of Need: The intent is to clarify which Inspector must certify R forms, specifically when there are different AIA's signing the certifications on the R-2 Form.

Meeting Action: D. Kinney presented a **PR**. T. Seime volunteered to join the TG to assist Mr. Kinney on this item.

Item Number: 21-12	NBIC Location: Part 3, 3.3.3, 3.4.4, Section 9	No Attachment

General Description: Clarify the definitions and examples of "Repair" and "Alteration"

Subgroup: Repairs and Alterations

Task Group: P. Becker (PM), K. Moore, P. Shanks, R. Underwood, M. Chestnut, T. Seime

Explanation of Need: Clarify the definitions of "Repair" and "Alteration" in the Glossary and revise the list of examples of each to better define the allowable scope of activities.

History: This Item was created as a result of conversation regarding Interp. Item 20-78 and Action Item 20-54

SG R&A Action: Progress Report

SC ACTION: Ms. Becker presented a **Progress Report**.

Meeting Action: P. Becker presented a presentation (placed on SG R&A Cloud).- This was a PR.

Item Number: 21-14	NBIC Location: Part 3, 3.4.3	No Attachment

General Description: ASME PCC-2 article references are incorrectly formatted

Subgroup: Repairs and Alterations

Task Group: P. Shanks (PM)

Explanation of Need: The 2018 edition of ASME PCC-2 has a different article numbering system than that used in the 2019 NBIC.

July SG R&A Meeting Action – P. Shanks - PR

Meeting Action: P. Shanks presented a **PR**.

Item Number: 21-15 **NBIC Location: Part 3, Section 5** **No Attachment**

General Description: Corrections and revisions to "R" Forms.

Subgroup: Repairs and Alterations

Task Group: D. Kinney (PM)

Explanation of Need: NBIC Part 3 is silent on controls for corrections or revisions to "R" Forms. The NBIC requires quality systems to provide revision controls, and I believe the NBIC should be clear on this as well.

Meeting Action: D. Kinney presented: The proposal was revised and taken back for more work. M. Toth was added to the TG – **This was a PR**

Item Number: 21-27 **NBIC Location: Part 3, 4.2 a)** **Attachment 24**

General Description: Provision of Exemption for original COC NDE requirements

Subgroup: Repairs and Alterations

Task Group: W. Sperko (PM)

Explanation of Need: Repair organizations that perform shop refurbishment and repair of LPG storage tanks (ASME Section VIII Div 1) encounter repetitive, typical defects that require repair. Many of the typical defects requiring repair meet the definition and could be considered Routine Repair. This being the case one of the frequently observed issues requiring weld repair is defects in original manufacturing butt welds at the head to shell joint with defects that include cold lap, and pinholes. The typical repair involves the excavation of the defect and confirmation of removal via PT. Then the excavation is welded with a typical repair length being less than 6" long. While the CoC in many cases in LPG storage tanks requires a spot RT of the head to shell join, performing RT on the minimal amount of welding typically performed on isolated defects serves no practical purpose in enhancing safety especially when the length of deposited weld metal would be less that the length of the length of the radiographic film used capture the image.

Meeting Action: W. Sperko presented. The proposal was revised and will be sent to **Letter Ballot to all SC and MC.**

Update: The proposal was balloted to SC R&A and received several comments that the PM will discuss during the meeting.

Item Number: 21-31	NBIC Location: NBIC Glossary	No Attachment

General Description: Revise definition of "Field"

Subgroup: Repairs and Alterations

Task Group: R. Miletti (PM), P. Gilston, M. Toth, J. Walker

Explanation of Need: A "Field" site under the current definition could be multiple rented or leased spaces used for repairs/alterations, where there is no single or specific customer or job, but rather the locations(s) are used for conducting repair/alteration activities by personnel employed by the Certificate Holder on a continual basis.

July SG R&A Meeting Action: The proposal was revised, and a TG was assigned: R. Miletti (PM), P. Gilston, M. Toth, - PR

Meeting Action: R. Miletti presented that this was a new Item and adding a definition of "shop" may provide more clarity on this. J. Walker volunteered to be on the TG, - This was a **PR**

Item Number: 21-33	NBIC Location: Part 3, 1.2 f)	Attachment 24

General Description: Use of code cases pertaining to repairs and alterations

Subgroup: Repairs and Alterations

Task Group: R. Underwood (PM)

Explanation of Need: The NBIC Part 3 already references code cases in various paragraphs such as NR quality requirements, welding method 7, and R Form instructions, but there is no direct reference to acceptance of their use. I think it's always been an unwritten rule that they are permitted to be used with acceptance of the Inspector and Jurisdiction. This proposal will address this in a new paragraph 1.2(f).

July SG R&A Meeting Action: R. Underwood presented – The proposal was revised and a motion to send to Rvw & Comment LB to SG and SC R&A was UA.

Meeting Action: R. Underwood presented – The proposal will be sent to **Rvw & Comment LB to SG and SC R&A**.

New Items:

Item Number: 21-37	NBIC Location: Part 3, 1.6	No Attachment

General Description: Parts used in NR Activities

Subgroup: Repairs and Alterations

Task Group: B. Wielgoszinski (PM)

Explanation of Need: Clarification that parts used in NR activities are fabricated by NR Certificate Holders and inspected by appropriately endorsed National Board commissioned Inspectors.

January 2022 Meeting Action:

Item Number: 21-43	NBIC Location: Part 3, Glossary	Attachment 26

General Description: Defining and revising "Practicable" and "Practical" within the NBIC

Subgroup: Repairs and Alterations

Task Group: M. Toth (PM)

Explanation of Need: Defining and revising Practicable and Practical within the NBIC and revising where applicable

January 2022 Meeting Action:

Item Number: 21-44	NBIC Location: Part 3, Glossary	Attachment 27

General Description: Defining "De-Rating" within Part 3

Subgroup: Repairs and Alterations

Task Group: M. Toth (PM)

Explanation of Need: Defining de-rating within Part 3

January 2022 Meeting Action:

Item Number: 21-45	NBIC Location: Part 3, Supplements	Attachment 28

General Description: Add a supplement to address oil, gas and chemical repair & alteration scope

Subgroup: Repairs and Alterations

Task Group: R. Underwood (PM)

Explanation of Need: There has been interest from companies operating with the Oil, Gas and Chemical industries to address certain types of repairs that may exist in ASME PCC-2 or API. NBIC does not have many of these repair methods within the book.

January 2022 Meeting Action:

Item Number: 21-53 **NBIC Location: Part 3, S8.5 a)** **Attachment 30**

General Description: Post Repair Inspection of weld repairs to CSEF steels

Subgroup: Repairs and Alterations

Task Group: P. Gilston (PM)

Explanation of Need: The requirement for Inspector involvement in post-repair inspections to CSEF weld repairs is to ensure future safe operation of the boiler. This is a function of the inservice Authorized Inspection Agency, not the Repair Inspector, whose duties end with completion of repair documentation.

January 2022 Meeting Action:

Item Number: 21-67 **NBIC Location: Part 3, 3.4.9** **Attachment 31**

General Description: Add welding requirements to plugging firetubes

Subgroup: Repairs and Alterations

Task Group: None assigned.

Explanation of Need: The current NBIC does not have enough direction or requirements for welding tube plugs in firetubes.

January 2022 Meeting Action:

Item Number: 21-68 **NBIC Location: Part 3, S9** **Attachment 32**

General Description: Removal of "final inspection" date from all Form R Report certifications.

Subgroup: Repairs and Alterations

Task Group: D. Kinney (PM)

Explanation of Need: To remove the unnecessary date requirement and eliminate confusion regarding what is the "final inspection" as it relates to repairs and alterations. The term "final inspection" is not defined in the NBIC, and the corresponding date has no bearing on the act and intent of the form certification.

January 2022 Meeting Action:

Item Number: 21-70 **NBIC Location: Part 3, Table 2.3** **Attachment 62**

General Description: Updating Table 2.3 in Part 3 with newest SWPSs

Subgroup: Repairs and Alterations

Task Group: J. Sekely (PM)

Explanation of Need: 13 SWPSs have been updated and approved by AWS, and the list of SWPSs in Table 2.3 will need to be updated to reflect these changes.

January 2022 Meeting Action:

Item Number: 21-71 **NBIC Location: Part 3, 3.4.9** **Attachment 63**

General Description: Remove the mechanical portion of tube plugging from 3.3.4.9. Only address i

Subgroup: Repairs and Alterations

Task Group: None assigned.

Explanation of Need: Removing the mechanical portion of the text. Many Jurisdictions are having a difficult time enforcing that part of the NBIC

January 2022 Meeting Action:

Item Number: 21-77 **NBIC Location: Part 3, 3.3.6** **Attachment 65**

General Description: Repairs/Alterations of Impact Tested Vessels

Subgroup: Repairs and Alterations

Task Group: None assigned.

Explanation of Need: There is an urgent need to address these concerns as the repair firms cannot comply with the existing wording in 3.3.6. The plan is to incorporate this item into the 2023 Edition of Part 3 and propose a corresponding Intent Interpretation that would provide guidance to NBIC users as soon as possible.

January 2022 Meeting Action:

Item Number: 21-80	NBIC Location: Part 3, 3.3.3 h) 2)	Attachment

General Description: Mechanical Replacement of Shell or Head

Subgroup: Repairs and Alterations

Task Group: None assigned.

Explanation of Need: This Code revision (corresponding to interpretation item 21-79) would provide clarity to NBIC users and address whether mechanical replacement of these components is considered a repair.

January 2022 Meeting Action:

Item Number: 21-82	NBIC Location: Part 3, 3.3.3 s)	Attachment 67

General Description: Examples of Repairs

Subgroup: Repairs and Alterations

Task Group: R. Underwood (PM).

Explanation of Need: Adding "repair" to 3.3.3(s) would then address use of different weld material. Currently 3.3.3(s) only addresses replacement of the part, not repair (Repair is addressed in 3.3.3(r)).

January 2022 Meeting Action:

12. Future Meetings

- July 2022 – TBD
- January 2023 – TBD

13. Adjournment

Respectfully submitted,

Terrence Hellman

Terrence Hellman

SC R&A Secretary

Moore	Kathy	National Board Certificate Holders	Chair	07/30/2024	Details
Toth	Marty	General Interest	Vice Chair	07/30/2024	Details
Hellman	Terrence		Secretary	12/30/2099	Details
Becker	Patricia	National Board Certificate Holders	Member	10/30/2022	Details
Boseo	Brian	General Interest	Member	07/30/2024	Details
Frazier	Steven	Jurisdictional Authorities	Member	07/30/2024	Details
Gilston	Philip	Manufacturers	Member	07/30/2024	Details
Hopkins	Craig	National Board Certificate Holders	Member	01/30/2022	Details
Kinney	Donald	Jurisdictional Authorities	Member	01/30/2024	Details
McBee	Timothy	Authorized Inspection Agencies	Member	10/30/2022	Details
Miletti	Ray	Manufacturers	Member	07/30/2022	Details
Moedinger	Linn	Users	Member	01/30/2022	Details
Morelock	Brian	Users	Member	01/30/2023	Details
Quisenberry	Michael	National Board Certificate Holders	Member	10/30/2022	Details
Schaefer	Benjamin	National Board Certificate Holders	Member	01/30/2022	Details
Seime	Trevor	Jurisdictional Authorities	Member	07/30/2023	Details
Sekely	James	General Interest	Member	07/30/2024	Details
Shanks	Paul	Authorized Inspection Agencies	Member	10/30/2022	Details
Siefert	John	General Interest	Member	10/30/2022	Details
Underwood	Robert	Authorized Inspection Agencies	Member	07/30/2023	Details

GTAW — Gas Tungsten Arc Welding	
Title	**Designation: Year**
Standard Welding Procedure Specification for Gas Tungsten Arc Welding of Carbon Steel, (M-1/P-1, Group 1 or 2), 3/16 in. ~~(5 mm)~~ through 7/8 in. ~~(22 mm)~~ Thick, ER70S-2 and ER70S-3, in the As-Welded Condition, ~~With or Without Backing~~ Primarily Plate and Structural Applications.	B2.1-1-002: 2020~~B2.1-002-90, B2.1-002-90(R2006) and B2.1-1-002-90R~~
Standard Welding Procedure Specification for Gas Tungsten Arc Welding of Carbon Steel (M-1/P-1/S-1, Group 1 or 2), 1/8 in. ~~(3.2 mm)~~ through 1 ½ ~~3/4~~ in. ~~(19 mm)~~ Thick, ER70S-2,	B2.1-1-207: 2019~~B2.1-1-207-96~~
Standard Welding Procedure Specification for Gas Tungsten Arc Welding of Carbon Steel (M-1/P-1/S-1, Group 1 or 2), 1/8 in. ~~(3.2 mm)~~ through 1 ½ in. ~~(38 mm)~~ Thick, ER70S-2, As-Welded or PWHT Condition, Primarily Pipe Application.	B2.1-1-207: 2019~~B2.1-1-207-96 (R2007)~~
Standard Welding Procedure Specification for Gas Tungsten Arc Welding (Consumable Insert) of Carbon Steel (M-1/P-1/S-1, Group 1 or 2), 1/8 in. ~~(3.2 mm)~~ through 1 ½ ~~3/4~~ in. ~~(19 mm)~~ Thick, INMs1 and ER70S-2, As-Welded or PWHT Condition, Primarily Pipe Application.	B2.1-1-210-96
Standard Welding Procedure Specification for Gas Tungsten Arc Welding with Consumable Insert Root of Carbon Steel (M-1/P-1/S-1, Group 1 or 2), 1/8 in. ~~(3.2 mm)~~ through 1-1/2 in. ~~(38 mm)~~ Thick, INMs-1, ER70S-2, As-Welded or PWHT Condition, Primarily Pipe Applications.	B2.1-1-210: 2012~~B2.1-1-210:2001 R2012~~

Combination of Carbon Steel (M-1/P-1 Material) To Austenitic Stainless Steel (M-8/P-8 Material)

SMAW — Shielded Metal Arc Welding	
Title	**Designation: Year**
Standard Welding Procedure Specifications for Shielded Metal Arc Welding of Carbon Steel (M-1/P-1/S-1, Groups 1 or 2) to Austenitic Stainless Steel (M-8/P-8/S-8, Group 1), 1/8 in. ~~(3.2 mm)~~ through 1 ½ in. ~~(38 mm)~~ Thick, E309(L)-15, -16, or -17, As-Welded Condition, Primarily Pipe Applications.	B2.1-8-216: 2012~~B2.1-1/8-228:2002R2013~~

PROPOSED INTERPRETATION

Item No.

21-39

Subject/Title

Routine repair scope

Project Manager and Task Group

Source (Name/Email)

Paul Shanks / paul.shanks@onecis.com

Statement of Need

Some R-certificate holders and AIAs are making huge (100 square feet) weld metal buildup type routine repairs on the basis that the components being built up are only 5" tubes and 3.3.2 e) 1) says welded repairs to 5" tubes are routine. As 3.3.2 e) includes "shall be limited to" shouldn't exceeding any one of the listed limitations preclude the routine repair approach.

Background Information

Repairs that exceed the limit listed in 33.2 e) 3) are being conducted which potentially places the public in harms way.

Proposed Question

Q1, In a boiler water wall which has been subject to wastage and requires weld metal build up, does the fact that the tubes are 5" or smaller mean that said build up is always routine regardless of the area involved? Q2 or if the area of weld build up exceeds 100in2 does the size and nature of the component being repaired become irrelevant?

Proposed Reply

A1, No A2, Yes

Committee's Question 1

Committee's Reply 1

Rationale

Committee's Question 2

Committee's Reply 2

Rationale

PROPOSED INTERPRETATION

Item No.

21-57

Subject/Title

Routine Repairs of Section VIII Div 1 built to Appdx 46

Project Manager and Task Group

Trevor Seime

Source (Name/Email)

Terrence Hellman / thellman@nationalboard.org

Statement of Need

Routine Repairs are not allowed for ASME Sect. VIII Div. 2 or 3 vessels. Routine Repairs should not be allowed for Div. 1 vessels built using the design considerations of Division 2 to establish the thickness and other design details of a component for a Section VIII, Division 1 pressure vessel.

Background Information

None.

Proposed Question

Are routine repairs permitted for ASME Section VIII Div. 1 vessels built in accordance with ASME Sect. VIII Div. 1 Appendix 46?

Proposed Reply

No.

Committee's Question 1

Are routine repairs permitted for ~~ASME Section VIII Div. 1 vessel~~ components ~~built~~ designed in accordance with ASME Sect. VIII, Div. 1, Appendix 46?

Committee's Reply 1

No.

Rationale

Routine Repairs are not allowed for ASME Sect. VIII Div. 2 or 3 vessels; therefore Routine Repairs should not be allowed for Div. 1 vessel components built using the design considerations of Division 2 to establish the thickness and other design details of a component for a Section VIII, Division 1 pressure vessel.

Committee's Question 2

Committee's Reply 2

Rationale

PROPOSED INTERPRETATION

Item No.

21-60

Subject/Title

UDS requirements for repairs and alterations for Divisions 2 & 3

Project Manager and Task Group

Source (Name/Email)

Mark Lower / lowermd@ornl.gov

Statement of Need

Is it the intent of interpretation 19-14 to prohibit the R-Certificate holder from recreating a UDS while still allowing the user to create the UDS? If yes, could the R-Certificate holder serve as the user's designated agent to recreate the UDS? Although this interpretation applies specifically to alterations, would this interpretation also be applicable to performing repairs (see 3.3.5.2(a))?

Background Information

Interpretation 19-14 states a UDS cannot be recreated when lost/destroyed. It is not clear how repair organizations will comply with the requirements of 3.4.5.1(a). However, it appears the user would be allowed to alter an existing UDS based on current parameters as noted in 3.4.5.1(b).

Proposed Question

Q: May a User's Design Specification be generated for the purpose of ASME Section VIII Div 2 or Div 3 vessel repairs or alterations by the user or their designated agent in the event the original UDS was lost/destroyed?

Proposed Reply

A: Yes

Committee's Question 1

Committee's Reply 1

Rationale

Committee's Question 2

Committee's Reply 2

Rationale

PROPOSED INTERPRETATION

Item No.

21-64

Subject/Title

Repair or Alteration activity allowed prior to Certification

Project Manager and Task Group

Source (Name/Email)

Terrence Hellman / thellman@nationalboard.org

Statement of Need

Applicants for the "R" Certificate are unclear if the NBIC allows for any activities to be performed prior to certification, especially since ASME does allow it.

Background Information

Below are references from the NB-415 and 2019 NBIC supporting A1 and A2. Per NB-415: 3.8 When all requirements have been met, a Certificate of Authorization will be issued evidencing permission to use the “R” Symbol Stamp. The Certificate of Authorization shall expire on the triennial anniversary date. Per NBIC: 1.4 ACCREDITATION a) Organizations performing repairs or alterations to pressure-retaining items shall be accredited as described in this section, as appropriate for the scope of work to be performed. 1.4.1 ACCREDITATION PROCESS a) The National Board administers accreditation programs for authorization of organizations performing repairs and alterations to pressure-retaining items in accordance with NB-415, Accreditation of “R” Repair Organizations. b) Any organization may apply to the National Board to obtain a Certificate of Authorization for the requested scope of activities. A review shall be conducted to evaluate the organization’s quality system. The individual assigned to conduct the evaluation shall meet the qualification requirements prescribed by the National Board. Upon completion of the evaluation, any deficiencies within the organization’s quality system will be documented and a recommendation will be made to the National Board regarding issuance of a Certificate of Authorization. c) As part of the accreditation process, an applicant’s quality system is subject to a review. National Board procedures provide for the confidential review resulting in recommendations to issue or not issue a Certificate of Authorization. 1.5.1 OUTLINE OF REQUIREMENTS FOR A QUALITY SYSTEM FOR QUALIFICATION FOR THE NATIONAL BOARD “R” CERTIFICATE OF AUTHORIZATION d) Statement of Authority and Responsibility A dated Statement of Authority and Responsibility, signed by a senior management official of the organization, shall be included in the manual. Further, the Statement shall include: 1) A statement that all repairs or alterations carried out by the organization shall meet the requirements of the NBIC and the Jurisdiction, as applicable; n) Acceptance and Inspection of Repair or Alteration 1) The manual shall specifically indicate that before the work is started, acceptance of the repair/alteration shall be obtained from an Inspector who will make the required inspections and confirm NBIC compliance by signing and dating the applicable NBIC Report Form upon completion of the work.

Proposed Question

Q1 - Can a new applicant's demonstration item be a welded repair to a PRI in accordance with the original code of construction prior to the applicant holding the "R" Certificate of Authorization? Q2 - Can the demonstration item in Q1 be stamped with the "R" Stamp pending a successful review if the Repair/Alteration activity is authorized by and has the required in-process involvement of the company's Repair Inspector?

Proposed Reply

A1 - No. No Repair/Alteration activities can be performed prior to holding an "R" Certificate of Authorization. A2 - No.

Committee's Question 1

Committee's Reply 1

PROPOSED INTERPRETATION

Item No.

21-74

Subject/Title

ASME Sect VIII, Div 1 Design Personnel Requirements and NBIC Repairs/Alts

Project Manager and Task Group

Source (Name/Email)

Luis Ponce / lponce@nationalboard.org

Statement of Need

Many have asked what, if any, impact the new ASME VIII-1 Appendix 47 design personnel requirements will have on NBIC repairs and alterations.

Background Information

Paragraphs 3.3.5 (Repairs to VIII-2 PRIs) and 3.4.5 (Alterations to VIII-2 PRIs) contain the statement that reads in part, "The repair/alteration plan shall be reviewed and certified by an engineer meeting the criteria of ASME Section VIII, Division 2 or 3, as appiicable...". The argument can be made that this would also apply to ASME Section VIII Division 1 alterations too in light of new Appendix 47, but not to repairs because there are no design functions associated with repairs in the NBIC.

Proposed Question

1. Are the 2021 ASME Section VIII, Division 1 Mandatory Appendix 47 design personnel requirements applicable to NBIC alterations to ASME Section VIII, Division 1 PRIs ? 2. Are the 2021 ASME Section VIII, Division 1 Mandatory Appendix 47 design personnel requirements applicable to NBIC repairs to ASME Section VIII, Division 1 PRIs ?

Proposed Reply

1 Yes, same as the NBIC requirements for ASME Secton VIII, Division 2 or 3 alterations. 2 No, there are no design functions associated with repairs.

Committee's Question 1

Committee's Reply 1

Rationale

Committee's Question 2

Committee's Reply 2

Rationale

PROPOSED INTERPRETATION

Item No.

21-75

Subject/Title

Routine Repairs

Project Manager and Task Group

Source (Name/Email)

Logan Somers / lsomers@harder.com

Statement of Need

The wording "but does not include nozzles to pressure-retaining items" could lead onto interpreting the nozzle as a whole including the joint attaching the nozzle to the PRI.

Background Information

When discussing scheduling of repairs this information is used by the owner to determine when the unit may be brought down for repair based on the availability of the Inspector.

Proposed Question

May the identical replacement of a waisted flange at the end of a nozzle off a PRI be considered a routine repair in accordance with the requirements of 3.3.2 when only the flange is replaced and not the joint attaching the nozzle to the PRI?

Proposed Reply

No

Committee's Question 1

May the ~~identical~~ replacement in kind of a ~~waisted~~ flange at the end of a nozzle, NPS 5 (DN 125) in diameter or smaller, ~~off~~ attached to a PRI be considered a routine repair in accordance with ~~the requirements of~~ Part 3 Section 3.3.2 (e) (1) when neither postweld heat treatment nor NDE other than visual is required and only the flange is replaced and not the joint attaching the nozzle to the PRI?

Committee's Reply 1

Yes

Rationale

The replaced flange would be considered a fitting in the category of Part 3 Section 3.3.2 (e) (1).

Committee's Question 2

Committee's Reply 2

Rationale

PROPOSED INTERPRETATION

Item No.

21-79

Subject/Title

Mechanical Replacement of Shell or Head

Project Manager and Task Group

Source (Name/Email)

Robert Underwood / robert_underwood@hsb.com

Statement of Need

This interpretation and corresponding Code revision would provide clarity to NBIC users and address whether mechanical replacement of these components is considered a repair.

Background Information

There are two conflicting NBIC interpretations relating to mechanical replacement of parts. Interpretation 01-29 states that NBIC neither requires nor prohibits documenting mechanical repair installation on a Form R-1. Recently passed interpretation 19-11 states that mechanical replacement of pressure retaining components in ASME Section VIII, Div. 3 vessels are considered a repair activity. 19-11 cites paragraph 3.3.3 which provides examples of repairs. Paragraph 3.3.3(h)(2) specifically states that replacement of head or shell in accordance with the original design. It does not specify whether head was replaced by welding or mechanical attachment.

Proposed Question

Is mechanical replacement of a shell or head of a pressure retaining item considered a repair activity?

Proposed Reply

Yes, see Part 3, 3.3.3(h).

Committee's Question 1

Committee's Reply 1

Rationale

Committee's Question 2

Committee's Reply 2

Rationale

PROPOSED INTERPRETATION

Item No.

21-81

Subject/Title

Repairs/Alterations of Impact Tested Vessels (Intent Interp)

Project Manager and Task Group

Source (Name/Email)

Robert Underwood / robert_underwood@hsb.com

Statement of Need

There is an urgent need to address these concerns as the repair firms cannot comply with the existing wording in 3.3.6. The purpose of this Intent Interpretation is to take the approved revisions to the 2023 NBIC Part 3 and provide immediate guidance to users involved in the repair and alteration activities of impact tested vessels.

Background Information

Existing paragraph 3.3.6 contains some requirements that the repair firm cannot comply with such as determining the heat treated condition and the notch toughness characteristics of the material to be repaired. It also contains references to dead links in the NBIC that provide no guidance to the repair firm. There is a corresponding item that is proposing elimination of the requirements of knowing the heat treated condition and the notch toughness characteristics of the material to be repaired and simply refer back to the original construction code in regards to WPS qualification. The intent interpretation would use the approved revisions and provide immediate guidance to users involved in the repair and alteration activities of impact tested vessels.

Proposed Question

Q1: When performing repair and alteration activities to pressure retaining items that have been impact tested, is it the intent that the test material used to qualify the welding procedure be of the same heat treated condition of the material being repaired? Q2: Is it the intent that the notch toughness of the material to be repaired be verified prior to performing a repair/alteration activity on a pressure retaining item that has been impact tested?

Proposed Reply

Replay 1: No, qualification of the welding procedure shall be in compliance with the following minimum requirements: a) Welding procedures used for repairs shall be qualified with impact testing when required by the original code of construction. The requirements for impact testing shall be in accordance with the rules of the original code of construction except that vessel (production) impact testing is not required. b) The test material for the welding procedure qualification with impact testing shall be of the same P-number and Group number as the material being repaired. Replay 2: No, qualification of the welding procedure shall be in compliance with the following minimum requirements: a) Welding procedures used for repairs shall be qualified with impact testing when required by the original code of construction. The requirements for impact testing shall be in accordance with the rules of the original code of construction except that vessel (production) impact testing is not required. b) The test material for the welding procedure qualification with impact testing shall be of the same P-number and Group number as the material being repaired.

Committee's Question 1

Committee's Reply 1

Rationale

Committee's Question 2

PROPOSED REVISION OR ADDITION

Item No.

A 21-78

Subject/Title

Alternative Weld Joint For Historical Boiler Barrel Replacement

NBIC Location

Part: Repairs and Alterations; Section: Supplement 2; Paragraph: S2.13.9.5(e)

Project Manager and Task Group

Source (Name/Email)

Robert Underwood / robert_underwood@hsb.com

Statement of Need

This proposal would introduce double welded lap joint connections of the barrel to wrapper sheet in lieu of riveted joints. It is not practical in many cases for repair firms to connect this joint by riveting.

Background Information

Historical boilers were manufactured with riveted joints, however in many cases it's more practical to use welded joints when restoring historical boilers. However, ASME Section I does not allow fillet welded lap joints when connecting replacement barrels to the wrapper sheet. The strength of a double fillet welded lap joint has proven to be equal, if not greater in strength than riveted joint designs and this proposal will introduce this type of joint as an alternative to riveted lap joints.

Existing Text	Proposed Text
	1) Double fillet welded lap joints connecting the replacement barrel to the wrapper sheet with a thickness not over 5/8 in. (16 mm) may be used as an alternative to double-riveted lap joint connections. (See NBIC Part 3, Figure S2.13.9.5)

	VOTE:						
COMMITTEE	Approved	Disapproved	Abstained	Not Voting	Passed	Failed	Date

PROPOSED REVISION OR ADDITION

Item No.

A 21-35

Subject/Title

Part 3, Table S1.1.3.1, Threaded Staybolts and Patch Bolts is incorrect

NBIC Location

Part: Repairs and Alterations; Section: S1; Paragraph: S!.1.3.1

Project Manager and Task Group

Source (Name/Email)

Linn Moedinger / linnwm@supernet.com

Statement of Need

The wording in the 2017 NBIC was "Threaded Staybolts and Patch Bolts SA-31 Grade A SA-675 with a tensile strength of 47,000 psi to 65,000 psi inclusive" A change was made for the 2019 Edition to reflect the grades rather than tensile strength. Somehow the wrong grades were used and this was not caught until now.

Background Information

ASME adopted SA-675 grades 45, 50, and 55 rather than using the tensile strengths of the material. Using the grades allows for material from 45ksi to 65ksi. The limitation of 7500 psi stay stress on locomotive boilers allows for 45ksi to be used with a design margin of 6.

Existing Text	**Proposed Text**
Threaded Staybolts and Patch Bolts SA-31 Grade A, SA-675 grade 60, 65, 70	Threaded Staybolts and Patch Bolts SA-31 Grade A, SA-675 grade ~~60, 65, 70~~45, 50, 55

1.5 QUALITY SYSTEM

A holder of a National Board *Certificate of Authorization* shall have and maintain a written Quality System. The Quality System shall identify the processes necessary to satisfactorily meet the requirements of the NBIC and shall be available for review. The Quality System may be in the form of a manual ~~or~~and may consist of several documents~~brief or voluminous~~, depending on the projected scope of work. The Quality System~~It~~ shall be treated confidentially by the National Board.

1.5.1 OUTLINE OF REQUIREMENTS FOR A QUALITY SYSTEM FOR QUALIFICATION FOR THE NATIONAL BOARD "R" *CERTIFICATE OF AUTHORIZATION*

The following is a guide for identifying features ~~is a guide for required features~~ which should be covered in the written Quality System as outlined in this section and ~~of a Quality System which shall be included in the organization's Quality System Manual. As a minimum, each organization~~ shall be ~~address~~ documented ~~the required features~~ relative to the scope of work ~~to be~~ performed ~~by~~within the Certificate Holder's ~~within. the O~~organization's Quality System. ~~shall explain their~~The intent, capability and applicability for each required feature shall be stated.~~outlined in this section.~~ Work may be subcontracted provided the necessary controls are clearly defined for maintaining full responsibility for code compliance by the National Board ~~repair organization~~Certificate Holder certifying the work.

a) Title Page

The title page shall contain the ~~organization's~~ Certificate Holder's legal name, ~~accepted abbreviation,~~ physical address, and ~~scope of activities~~Scope of Work.

The scope of work shall clearly indicate the type of repairs and/or alterations the Certificate Holder is capable of and intends to carry out. The scope of work indicated shall include the following, as applicable.

- Repairs Only at either Shop or Field or Both
- Alterations Only at either Shop or Field or Both
- Repairs and Alterations at either Shop or Field or Both
- Metallic Repairs
- Non-Metallic Repairs
- Design Only

b) Content Page

The Quality System shall contain a page listing the contents of the manual by section, number (if applicable), revision level, and date of each section, as required for manual control. ~~The content page shall list the activities described for in the Quality System so that each subject or document, number (if applicable), and revision level is clearly identified.~~

~~c) Scope of Work~~

~~The scope of work shall clearly indicate the type of repairs and/or alterations the Certificate Holder organization is capable of and intends to carry out. The scope of work indicated shall include the following, as applicable.~~

~~Repairs Only at either Shop or Field or Both~~
~~Alterations Only at either Shop or Field or Both~~
~~Repairs and Alterations at either Shop or Field or Both~~
~~Metallic Repairs~~
~~Non-Metallic Repairs~~
~~Design Only~~

~~d~~c) Statement of Authority and Responsibility

A dated ~~dated~~ *Statement of Authority and Responsibility*, ~~signed by a senior management official of the organization,~~ shall clearly identify that the ~~be included in the~~ Quality System has the full support of management and endorsed by signature of a senior management official. ~~Further, the~~The *Statement* shall also include:

1) A statement that all repairs or alterations carried out by the Certificate Holder ~~organization~~ shall meet the requirements of the NBIC and the Jurisdiction, as applicable;

2) The title of the individual who has the authority and responsibility charged with the development and ~~ensuring the Quality System is~~ implementation~~ed~~ of the Quality System and ~~as described, and confirming~~ the freedom to identify quality problems, and to initiate, recommend and provide solutions and when required, stop or prohibit work from continuing.

3) A statement that ~~if there are~~ conflicts or~~is a~~ disagreements with ~~in~~ the implementation of the Quality System, ~~will~~shall be brought to the attention of the Certificate Holder's ~~organization's~~ senior management official~~the matter is to be referred~~ for a resolution ~~to a higher authority and shall be resolved in a manner~~ that will not conflict with code, jurisdiction/regulatory authority or Quality System requirements~~; and~~.

~~e~~d) ~~Manual~~ Quality System Control

The Quality System~~manual~~ shall define how~~include the necessary provisions for~~ revisions~~g~~ of individual ~~subjects~~sections, exhibits or documents will be identified, and how distribution and retrieval~~issuing documents~~ will be achieved to ensure~~keep the manual current~~ only the latest accepted revisions are available for use. In addition, the following shall be documented:

1) The title of the individual responsible for the preparation and~~authorized to~~ approval~~e~~ of the Quality System including review of code editions, standards, and jurisdictional requirements.

2) ~~revisions shall be included in the manual.~~ Acceptance from the ~~Revisions must be accepted by the~~ Authorized Inspection Agency prior to issuance and implementation of the Quality System~~manual and its implementation~~.

~~f~~e) Certification

When electronic certification of documents is used, the Quality System shall include provisions describing the controls and safe guards that are employed to ensure the integrity of the certification.

~~g~~f) Organization

The Quality System shall include ~~A~~an organizational chart which~~shall be described included for in the manual. It shall~~ reflects actual levels of authority~~-~~ and lines of communication associated with ~~the~~ functional job titles identified.~~-~~ In addition, roles and responsibilities associated with ~~the~~ functional job titles identified within the ~~organizational chart~~Quality System, ~~include the title of the heads of all departments or divisions that perform functions~~ that can affect the quality of the repair or alteration, shall be clearly defined and documented.~~: and it shall show the relationship between each department or division. The manual shall identify the title of those individuals responsible for preparation, implementation, or verification of the Quality System. The responsibilities shall be clearly defined and the~~

~~individuals shall have the organizational freedom and authority to fulfill those responsibilities. The following activities shall be documented :~~

- ~~Responsibilities associated with the Authorized Inspection Agency (AIA) of record.~~
- ~~Protocol describing when the AIA of record cannot provide coverage.~~
- ~~Personnel performing supervisory activities for procedure and performance qualifications shall:~~

~~(a) be designated by the organization with responsibility for certifying qualification documents.~~

~~(b) have a satisfactory level of competence in accordance with the organization's quality program.~~

~~(c) have a record, maintained by the organization, containing objective evidence of the qualifications, training, or experience.~~

~~g~~hg) Drawings, Design and Specifications

The ~~manual~~Quality System shall contain controls to ensure that all applicable design information, ~~applicable~~ drawings, ~~design~~ calculations, specifications, and instructions are prepared or obtained, controlled, and interpreted in accordance with the scope of work and the original code of construction, including: ~~.~~

- Initiation of ~~job~~unique identifying ~~-~~numbers ~~and control of associated work~~.
- ~~Define~~Description of the ~~-~~scope of work.
- Performance and approval of design including title of approver.
- Drawings and other pertinent information (i.e., Code Edition, pressure, temperature, minimum design metal temperature, nondestructive examination (~~-NDE~~NDE), heat treatment, weld details, etc.)
- Review of design calculations, drawings, material specifications and process control sheets with Inspector to obtain acceptance.
- Revision and distribution control of design documents

~~i~~hh) Repair and Alteration Methods

~~The manual~~Quality System ~~shall include controls for repairs and alterations, including mechanical assembly procedures, materials, nondestructive examination methods, pre-heat, and postweld heat treatment, as applicable. Special requirements such as nonmetallic repairs and alterations to graphite and fiber-reinforced thermosetting plastic pressure-retaining items including bonding or mechanical assembly procedures shall be addressed, if applicable.~~The Quality System shall describe the methods for performing and documenting repairs and alterations in sufficient detail to permit the Inspector to determine at what stages specific inspections are to be performed. The method of repair or alteration must have prior acceptance of the Inspector, and when required, the jurisdiction. ~~.~~

~~j~~ii) Materials

The ~~manual~~Quality System shall describe the method used to ensure that only acceptable materials (including welding material) are used for repairs and alterations. The Quality System~~manual~~ shall include a description of how existing material is identified and new material is ordered, verified, and identified. The Quality System~~manual~~ shall identify the title of the individual(s) responsible for each function and a brief description of how the function is to be performed.

kj) Method of Performing Work

The Quality Systemmanual shall describe the methods for performing and documenting repairs and alterations in sufficient detail to permit the Inspector to determine at what stages specific inspections are to be performed. The method of repair or alteration must have prior acceptance of the Inspector. It is also essential that the Quality System include provisions to ensure safe working conditions during welding, testing, and all activities related to repairs and alterations.

jlk) Welding, NDE and Heat Treatment

The manual Quality System shall describe controls for welding, nondestructive examinationNDE, and heat treatment.

Welding –

The Quality Systemmanual is to shall indicate identify the title(s) of the individual(s) responsible for development of the welding procedure specification (WPS), and its qualification, and the qualification of welders and welding operators. It is essential that onlyOnly qualified welding procedure specificationWPS's and welders or welding operators qualifiedwillshall , as required by the NBIC, be used in the repair or alteration of pressure-retaining items. It is also essential that welders and welding operators maintain their cContinuity for welders and welding operators will be maintainedproficiency as required by the NBIC, while engaged in the repair or alteration of pressure-retaining items. The manualQuality System shall also describe controls for ensuring that the required WPS or Standard Welding Procedure Specification (SWPS) is available to the welder or welding operator prior to welding and establish the basis for welder to weld traceability.

NOTE: For qualification of welders and welding procedures to the 2019 ASME Code or later, the Quality System shall identify the title and qualifications of personnel performing supervisory activities as defined in ASME Section IX as applicable.Similar responsibility for nondestructive examination and heat treatment shall be described in the manual.

k) Nondestructive examinationNDE –

The title(s) of the individual(s) responsible to determine the type and extent of NDE required for the repair and/or alteration shall be identified. It is also essential that this manualThe Quality System shall indicateidentifys the title(s) of the individual(s) responsible for the review and acceptance of subcontracted NDE procedures and personnel. When NDE is performed in-house, the title(s) of the individual(s)l responsible for the written practice and the standard used for the basis of training, qualification, and records shall be documented.

l) Heat treatment

–The manualQuality System shall indicatedentify the title(s) of the individual(s) responsible to ensure that a proper heat treatment has been applied to the repair and/or alteration. The Quality System shall indicatedentify the title(s) of the individual(s) responsible for the review and acceptance of subcontracted heat treatment procedures and personnel. It is also essential that theThe use of alternative welding methods per the NBIC, Part 3, 2.5.3 shall be described in the Quality System.

lmkm) Examinations and Tests

The Quality SystemReference shall describe the process used to ensure that all required examinations and tests have been successfully performed and made available to the Inspector for acceptance be made in the manual for examinations and tests upon completion

of the repair or alteration, prior to signing the Form "R" Report and accepted by the Inspector.

mnln) Calibration

The Quality Systemmanual shall describe a system for the calibration of examination, measuring, and test equipment used in the performance of repairs and alterations. At a minimum, it shall include:

1) Examination, measuring, and test equipment, subject to calibration, shall have a unique identification number and a calibratedion date as well as a specified next calibration due date.

2) The methodology of how the various equipment will be calibrated.

3) The title of the person(s) responsible for the the calibration system of the equipment.

4) A statement that all calibrations will be tracible to the National Institute of Standards and Technology (NIST) or another nationally recognized Standards Organization, as much as practical.described

omon) Approval, Inspection,Authorization and Acceptance and Inspection of Repair and/or Alteration

The Quality Systemmanual shall specifically indicate state that before the work is started, acceptance authorization of the repair/alteration plan and acceptance of the method(s) used shall be obtained from an the Inspector who will make the required inspections.

and confirm NBIC compliance by signing and dating the applicable NBIC Form "R" Report Form upon completion of the work. In addition,

Tthe Quality Systemmanual shall specifically address allowance for acceptance of the inspector for application of the "R" symbol stamp to a pressure retaining item and .

The manual shall provide for adequate control of the "R" Symbol Stamp.

pnpo) Inspections and InspectionsDocument Review

The manual Quality System shall make provisions for the Inspector to have access to the physical work and all all drawings, design calculations, specifications, procedures, process sheets, repair or alteration procedures, test results, and other documents as necessary to ensure compliance with the NBIC. A copy of the current manualQuality System shall be available to the inspectorInspector.

pqoq) Control of the "R" Symbol Stamp

The Quality System shall provide adequate control of the "R" Symbol Stamp. In addition, the Quality System shall make provisions for Inspector acceptance for the application of the "R" Symbol Stamp to the pressure retaining item or nameplate.

The accepted abbreviation of the "R" Certificate Holder's name shall be included in the manual.

prpq)r) Report of Repair or Alteration Form

The Quality Systemmanual shall indicate the title of the individuals responsible for preparing, signingcertifying, and presenting the NBIC Report Forms to the Inspector. The Inspector shall confirm NBIC compliance by certifying and dating the applicable NBIC Form "R" Report upon completion of the work. The distribution of the NBIC Form "R" Report shall be described in the Quality System.

The distribution of the NBIC Form "R" Report Forms shall be described in the manual.

qs)qs) Exhibits

Any formsForms referenced in the Quality Systemmanual shall be included and. The form may be a part of the referencing document or included as an exhibit or appendix. For clarity, the forms may be completed and identified as examples. When forms are identified as examples, a statement shall clearly define the acceptable modifications to the examples without requiring Inspector acceptance.Different forms may be utilized without the need for acceptance by the Inspector as long as they contain the same information as the exhibited forms.The name and accepted abbreviations of the "R" Certificate Holder shall be included in the manual.

rtrs) Construction Code

The Quality Systemmanual shall include provisions for addressing the requirements that pertain to the specific construction codecode of construction for the equipment being repaired or altered to include any applicable code cases or interpretations. with acceptance of the jurisdiction.

sustt) Nonconformances
ing Items

AThere shall be a system shall be established to identify and control a product or service serviceprocess a nonconformance ocurrs any characteristics do not conform in adherencewhich does not conform to the applicable rules of the NBIC, code of construction code, or jurisdictional requirements, or the Quality System to prevent their use. acceptable to the Inspector for the correction of nonconformities. A nonconformance is any condition that does not comply with the applicable rules of the NBIC, construction code, jurisdictional requirements, or the quality system. In addition, theThe title(s) of the individual(s) who has responsibility and authority for the disposition and resolution disposition of of a nonconformance nonconforming itemsshall be defined including provisions for Inspector involvementNonconformance must be corrected or eliminated before the repaired or altered component can be considered in compliance with the NBIC. Handling of programmatic concerns which do not affect product or service may be addressed in the Quality System.It is also essential that systemic or programmatic nonconformances be identified and corrected and when necessary, corrected within the Quality System.

tvtuu) Records Retention

The quality manual shall describe aA system for filing, maintaining, and easily retrieving records supporting or substantiating the administration of the Quality System within the scope of the "R" *Certificate of Authorization*.

1) Records may represent any information ~~used to further substantiate the statements~~ used to provide documented evidence ~~to describe the scope~~ of the quality of items and quality control activities of the work completed to a pressure-retaining item (PRI), and documented on a Form “R” report as applicable. ~~.~~

2) Records may include, but are not limited to those depicting or calculating an acceptable design, material compliance or certifications, NDE-reports, PWHT-charts, a WPS used, a welder, bonder, or cementing technician’s process continuity records, drawings, sketches, ~~or~~ photographs, etc.

3) The record retention schedule described in the Quality System ~~Manual is to~~shall ~~-~~follow the instructions identified in NBIC Part 3, Table 1.5.1.

PROPOSED REVISION OR ADDITION

Item No.

20-83

Subject/Title

Definition of Nonconformance

NBIC Location

Part: Repairs and Alterations & Repairs and Alterations; Section: 9 & 1.5; Paragraph: Glossary & 1.5.1 s)

Project Manager and Task Group

Source (Name/Email)

Terrence Hellman / thellman@nationalboard.org

Statement of Need

Action Item 19-60 is proposing revisions/additions to all of 1.5.1. This proposal is to move the definition of "Nonconformance" out of the current 1.5.1 s) paragraph and into the glossary.

Background Information

Current text in 1.5.1 s) that is being revised via Action Item 19-60: s) Nonconforming Items There shall be a system acceptable to the Inspector for the correction of nonconformities. A nonconformance is any condition that does not comply with the applicable rules of the NBIC, construction code, jurisdictional requirements, or the quality system. Nonconformance must be corrected or eliminated before the repaired or altered component can be considered in compliance with the NBIC.

Existing Text

Proposed Text

Nonconformance – A condition of product or service in which any characteristics do not conform with the applicable rules of the NBIC, construction code, jurisdictional requirements, or the quality system.

	VOTE:						
COMMITTEE	Appr oved	Disapproved	Abs taine d	Not Voting	Passed	Faile d	Date

e) For Transport Tanks, the Competent Authority, i.e. the U.S. Department of Transportation (DOT), shallbe consulted for any requirements which it has established since they take precedence for repairs.

1) Transport tanks manufactured prior to the adoption of ASME Section XII by the Competent Authority(DOT) were constructed in accordance with ASME Section VIII, Division 1. Certain transport tanks manufactured to this code were required to be stamped in accordance with Section VIII, Division 1, if the design pressure of the transport tank was 241 kPa (35 psi) (depending on material being transported) and greater. If the design pressure was less than 241 kPa (35 psi) (depending on material being transported), the transport tank was manufactured in accordance with Section VIII,Division 1, but not required by the Competent Authority (DOT) to be stamped.

2) ASME stamped transport tanks are subject to the requirements of NBIC Part 3, for continued inservice repairs, alterations, or modifications, unless exempted by the Competent Authority (DOT).

1.3 INSPECTOR

a) Inspection and certification shall be made by an Inspector holding a valid commission with the appropriate endorsement issued by the National Board and employed by an Authorized Inspection Agency (seeNBIC Part 3, Section 9, Glossary of Terms for definition of Authorized Inspection Agency).

b) An Inspector employed by an Owner-User Inspection Organization or a Federal Inspection Agency mayauthorize and accept work only on pressure-retaining items owned or used by the respective organization. Each accredited Owner-User Inspection Organization's quality program shall have specific approval of the Jurisdiction as required.

1.3.1 AUTHORIZATION

a) The Inspector's authorization to perform a repair or alteration shall be obtained by the repair organization prior to initiation of a repair or alteration to a pressure-retaining item. The Inspector shall determine that the repair or alteration methods are acceptable.

b) Subject to acceptance of the Jurisdiction, the Inspector may give approval for routine repairs prior to thestart of work, provided the Inspector ensures that the "R" Certificate Holder has adequately addressed routine repairs in the quality program.

~~1.3.2 ACCEPTANCE INSPECTION~~ 1.3.2 INSPECTIONS AND CERTIFICATIONS

a) ~~The Inspector making the acceptance inspection~~ Inspections and NBIC Report Form certifications shall be performed by the same Inspector who authorized the repair or alteration activity. Where this is not possible or practicable, another Inspector may perform~~-~~ these ~~the~~ ~~-~~duties ~~acceptance inspection~~; however, in all cases, the Inspectors ~~who performs the acceptance inspection~~ shall be employed by the same AIA ~~an employee of the same organization~~ as the Inspector who authorized the repair or alteration activity.

b) Before signing the appropriate NBIC Report Form, the Inspector shall: ~~review the drawings, ensure the repair or alteration was performed in accordance with the accepted code of construction or standard, witness any pressure test or any acceptable alternative test method applied, ensure that the required nondestructive examinations have been performed satisfactorily, and that the other functions necessaryto ensure compliance with the requirements of this code have been satisfactorily performed.~~

1) Verify the repair or alteration activity was performed in accordance with the NBIC and accepted code of construction or standard,

2) Verify any other functions necessary to ensure compliance with the requirements of the NBIC have been satisfactorily performed,

3) Verify all applicable Inspector duties have been performed as required in NB-263 RCI-1.

4) Verify the stamping or nameplate is correct and where applicable, the nameplate has been properly attached.

~~b) The Inspector shall verify the stamping or nameplate is correct and where applicable, the nameplatehas been properly attached.~~

PART 3, SECTION 5
REPAIRS AND ALTERATIONS — CERTIFICATION/DOCUMENTATION AND STAMPING

5.1 SCOPE

This section provides requirements for certification, stamping, and documentation of repairs and alterations to pressure-retaining items. Applicable forms are provided in this section for reference. Forms may be obtained from the National Board website.

5.2 DOCUMENTATION (21)

a) Repairs that have been performed in accordance with the NBIC shall be documented on a Form R-1, *Report of Repair*, as shown in Supplement S9.2. A Form R-4, *Report Supplement Sheet*, as shown in Supplement S9.5, shall be used as needed to record additional data when the space provided on Form R-1 is not sufficient.

b) Alterations performed in accordance with the NBIC shall be documented on a Form R-2, *Report of Alteration*, as shown in Supplement S9.3. A Form R-4, *Report Supplement Sheet*, as shown in Supplement S9.5, shall be used as needed to record additional data when the space provided on Form R-2 isnot sufficient.

c) The organization performing repairs and alterations shall retain a copy of the completed Form “R” Report on file and all records and documentation substantiating the summary of work as described throughout Section 5, and as identified in the “R” Certificate Holder’s Quality System Manual.

d) Form R Reports shall be completed and certified by the Certificate Holder and the Repair Inspector no more than 90 days following the completion of the physical construction work, or following the completion of design work when no construction work is required.

5.2.1 PREPARATION OF FORM R-1 (REPORT OF REPAIR)

a) Using the instructions found in Table S9.2 of Supplement 9, preparation of Form R-1 shall be the responsibility of the “R” Certificate Holder performing the repair.

b) Information describing the scope of work used to repair a pressure-retaining item (PRI) shall be documented on a Form R-1 and extended to a Form R-4 as needed to fully describe the repair activitiescompleted per the instructions at in Table S9.2 of Supplement 9.

c) An Inspector shall indicate acceptance by signing Form R-1, and Form R-4, if attached.

d) The Form R-3, *Report of Parts Fabricated by Welding,* Manufacturer’s Data Reports, and Certificates of Compliance described in this section shall be a part of the completed Form R-1 and shall be attached thereto. (21)

5.2.2 PREPARATION OF FORM R-2 (REPORT OF ALTERATION)

a) Using the instructions found in Table S9.3 of Supplement 9, initial preparation of Form R-2 shall be the responsibility of the “R” Certificate Holder responsible for the design portion of the alteration. The design organization shall complete and sign the “Design Certification” section of the Form R-2. An Inspector shall indicate acceptance of the design by signing the “Certificate of Design Change Review” section of the Form R-2.

b) The information describing an alteration to a pressure-retaining item shall be identified on Form R-2 with a complete description of the scope of work for physical or non-physical changes. When the scope of work represents a change that will increase the Minimum Required Relieving Capacity (MRRC) of a pressure-retaining item, such as a change in heating surface, Maximum Designed Steaming Capacity

5.4 DISTRIBUTION OF FORM R-2

a) Distribution of completed Form R-2 shall be the responsibility of the “R” Certificate Holder who performed the construction portion of the alteration. When no construction work is performed (e.g., a re-rating with no physical changes), the “R” Certificate Holder responsible for the design shall distribute the form.

b) Legible copies of the completed Form R-2, together with attachments, shall be distributed to the owner-user, the “R” Certificate Holder responsible for design, and the Jurisdiction, if required, and shall be provided to the Inspector and inservice Authorized Inspection Agency of the pressure retaining item upon request.

5.5 REGISTRATION OF FORMS — GENERAL

a) When registration of the forms are required, the Certificate Holder performing a repair or alteration shall submit the completed form, meeting the requirements of the NBIC, to the National Board no more than 30 days following certification.

b) When registration of the forms is not required, the Certificate Holder may register the completed form, meeting the requirements of the NBIC, with the National Board.

c) The “R” or “NR” Certificate Holder should be aware that some Jurisdictions may require registration of repairs and alterations with the National Board.

5.5.1 REGISTRATION FOR REPAIRS

Form R-1 may be registered with the National Board as noted in NBIC Part 3, 5.5.

5.5.2 REGISTRATION FOR ALTERATIONS

a) If the pressure-retaining item is originally registered with the National Board, an original Form R-2, together with attachments, shall be registered with the National Board.

b) If the item was not registered with the National Board, one original Form R-2, together with attachments, may be registered with the National Board or retained as required by the Quality System Manual.

5.5.3 REGISTRATION FOR FIBER-REINFORCED VESSELS

Organizations performing repairs or alterations under an “R” stamp program shall register such repairs or alterations with the National Board.

5.5.4 REGISTRATION FOR NUCLEAR REPAIR/REPLACEMENT ACTIVITIES

Organizations performing repair/replacement activities under the “NR” or “NVR” stamp program shall register forms with the National Board.

5.5.5 REGISTRATION FOR GRAPHITE VESSELS

Organizations performing repair/replacement activities under the “R” stamp program shall register such repairs or alterations with the National Board.

Existing words

4.2 NONDESTRUCTIVE EXAMINATION

a) The nondestructive examination (NDE) requirements, including technique, extent of coverage, procedures, personnel qualification, and acceptance criteria, shall be in accordance with the original code of construction for the pressure-retaining item. Weld repairs and alterations shall be subjected to the same nondestructive examination requirements as the original welds. Where this is not possible or practicable, alternative NDE methods acceptable to the Inspector and the Jurisdiction where the pressure-retaining item is installed, where required, may be used.

1) For welds that were subject to volumetric NDE during construction, repairs may be examined by MT or PT in lieu of volumetric examination under all of the following conditions:
    a) The repair depth does not exceed the lesser of 1/8 inch (3 mm) or 25% of the nominal base material thickness;
    b) The aggregate repair length is no longer than the lesser of 6 inches (150 mm) or 10% of the total joint length; and
    c) The base material and each layer of deposited weld shall be examined with MT or PT.

PROPOSED REVISION OR ADDITION

Item No. 21-33

Subject/Title: Use of code cases pertaining to repairs and alterations

NBIC Location Part: Repairs and Alterations; Section: 1; Paragraph: 1.2(~~f~~a)

Project Manager and Task Group: Robert Underwood, Subcommittee Repairs/Alterations

Source (Name/Email): Robert Underwood / robert_underwood@hsb.com

Statement of Need: The NBIC Part 3 already references code cases in various paragraphs such as NR quality requirements, welding method 7, and R Form instructions, but there is no direct reference to acceptance of their use. I think it's always been an unwritten rule that they are permitted to be used with acceptance of the Inspector and Jurisdiction. This proposal will address this in a new paragraph 1.2(~~f~~a).

Background Information: Section IX approved Code Case 3002 which addresses qualification of WPS and WPQ relating to the Explosion Welding Process for Tube Plugging. This Code Case was specifically written for NBIC use. This proposal will clarify that use of code cases are permitted with Inspector and Jurisdiction approval, when required.

Existing Text :

Proposed Text:

1.2(~~f~~a) When the standard governing the original code of construction is the ASME Code or ASME RTP-1, repairs and alterations to pressure-retaining items shall conform, insofar as possible, to the section and edition of the ASME Code most applicable to the work planned. Use of active ASME Code Cases pertaining to the repair and alteration of pressure retaining items are subject to review and acceptance of the Inspector, and when required, the Jurisdiction. Use of the ASME Code Case shall be noted on the appropriate Form R Report.

PROPOSED REVISION OR ADDITION

Item No.

A 21-43

Subject/Title

Defining and revising "Practicable" and "Practical" within the NBIC

NBIC Location

Part: Repairs and Alterations; Section: 9; Paragraph: Glossary - All Parts

Project Manager and Task Group

Marty Toth, Subcommittee Repairs/Alterations

Source (Name/Email)

Marty Toth / mtoth@boiscotraininggroup.com

Statement of Need

Defining and revising Practicable and Practical within the NBIC and revising where applicable

Background Information

Defining and revising Practicable and Practical within the NBIC and revising where applicable

Existing Text	Proposed Text
	TBD

	VOTE:						
COMMITTEE	Approved	Disapproved	Abstained	Not Voting	Passed	Failed	Date

PROPOSED REVISION OR ADDITION

Item No.

A 21-44

Subject/Title

Defining "De-Rating" within Part 3

NBIC Location

Part: Repairs and Alterations; Section: Section 3; Paragraph: 3.4.1

Project Manager and Task Group

Marty Toth, Subcommittee Repairs/Alterations

Source (Name/Email)

Marty Toth / mtoth@boiscotraininggroup.com

Statement of Need

Defining de-rating within Part 3

Background Information

Defining de-rating within Part 3

Existing Text	Proposed Text
	TBD

	VOTE:						
COMMITTEE	Approved	Disapproved	Abstained	Not Voting	Passed	Failed	Date

Item NB21-45, add "SUPPLEMENT XX - REPAIR METHODS OF PRESSURE VESSELS AND PIPING EXCLUSIVE TO OIL, GAS, AND CHEMICAL INDUSTRIES"

SXX.1 SCOPE

This supplement provides methods for repair of pressure vessels and piping, outside the boiler setting, exclusive to oil, gas, and chemical industries.

SXX.2 CONSTRUCTION STANDARDS

Repairs shall conform, insofar as possible, to the relevant requirements of the edition of the code of construction. Where this is not practicable, it is permissible to use other codes, standards, or specifications, provided the "R" Certificate Holder has the concurrence of the Inspector and the jurisdiction, where required.

SXX.3 LIMITATIONS

Repairs will be limited to pressure retaining items which comply with the following conditions:

a) Operates at or below 650°F (345°C) for carbon steels or below the time dependent service temperatures for low alloy steel.

b) Impact testing was not required.

c) No environmental or service-related cracking conditions exist. Service-related cracks may remain in the item when a Fitness for Service Assessment (FFSA) in accordance with NBIC, Part 2, 4.4.1, has been performed supporting the continued service of the item.

SXX.4 JURISDICTIONAL REQUIREMENTS

Repairs will require notification to the jurisdiction and where required, jurisdictional approval prior to performing work.

SXX.5 REPAIR METHODS

a) WELDED LAP PATCH

A fillet welded patch is a repair method used to maintain the structural integrity of the pressure retaining item by providing an external boundary over the area exhibiting damage in the form of a "fillet welded patch" as described by ASME PCC-2, Full Encirclement Steel Reinforcing Sleeves for Piping, Fillet Welded Lap Patches with Reinforcing Plug Welds, or Fillet Welded Lap Patches.

1) Welded lap patches shall be further restricted as follows:

a. A lap patches installed over an existing lap patch is prohibited.

b. The distance between patches shall not be less than $2\sqrt{(Rt)}$.

2) Except as required in Part 3, Paragraph SXX.5 a)4)a), ASME PCC-2 shall be used for the design of the fillet welded patch and shall be in accordance with the original code of construction, when practicable. Design of the fillet welded patch shall consider original design conditions, taking in to account current service conditions and damage mechanisms. Use of this method shall be acceptable to the inspector and when required, the jurisdiction and shall be limited to pressure containing equipment owned and operated by an Owner-User.

a. Replacement of a pressure-retaining part with a material of different nominal composition and, equal to or greater in allowable stress from that used in the original design, provided the replacement material satisfies the material and design requirements of the original code of construction under which the vessel was built. The minimum required thickness shall be at least equal to the thickness stated on the original Manufacturer's Data Report.

3) The "R" Certificate Holder responsible for the design of the fillet welded patch shall ensure a Fitness for Service Assessment (FFSA) has been performed on the

portion of the item being patched in accordance with NBIC, Part 2, 4.4.1, supporting the continued service of the item. The fillet welded patch repair method shall not remain in place beyond the calculated remaining life of the covered portion of the pressure retaining item.

a) The remaining life of the pressure retaining item shall be documented on the Report of FFSA in the Remarks section. The Report of FFSA Form shall be affixed to the Form R-1 and identified in the Remarks section.

b) The thinned or leaking area shall be fully covered, as specified in the FFSA, to the distance where the minimum required metal thickness is verified. Wall thickness shall be verified in the area to be welded.

c) A fillet welded patch method shall not be used where cracks are present unless the cracks have been removed and repaired in accordance with Part 3, 3.3.4.2 a); the condition that led to the crack formation and propagation have been eliminated.

4) Hazards associated with welding on degraded components should be addressed with the Owner-User by the use of engineering controls, administrative controls and personal protective equipment.

a) When the pressure retaining item will remain in service while implementing a fillet welded patch, the requirements and limitations described within ASME PCC-2, Part-1 shall be used in conjunction with ASME PCC-2, Part-2, Full Encirclement Steel Reinforcing Sleeves for Piping, Fillet Welded Lap Patches with Reinforcing Plug Welds, or Fillet Welded Lap Patches as applicable.

b) API RP-2201, “Safe Hot Tapping Practices in the Petroleum and Petrochemical Industries” may be used as a guideline for identifying hazards associated with welding to a component that is under pressure, including service restrictions.

5) Test or examination methods shall be in accordance with NBIC, Part 3, 4.4.1.

a) Visual examination shall be in accordance with the NBIC, Part 3, 4.4.1 e).

SXX.6 Post Repair Inspection

a) After the completion of weld repairs, post repair inspection requirements shall be established in accordance with Part 3, 3.3.4.8.

SXX.7 Documentation

a) Completion of the Form R-1 shall follow the requirements for preparation, distribution, and registration as described in Part 3, Section 5.

Additional actions required by accepting this item:

Revise the succeeding paragraph numbering order (ref.2021-edition) to:

3.3.3 EXAMPLES OF REPAIRS

v) The installation of a fillet welded patch.

PROPOSED REVISION OR ADDITION

Item No.

A 21-53

Subject/Title

Post Repair Inspection of weld repairs to CSEF steels

NBIC Location

Part: Repairs and Alterations; Section: S8.5; Paragraph: a)

Project Manager and Task Group

Source (Name/Email)

Mark Kincs / mark.r.kincs@xcelenergy.com

Statement of Need

The requirement for Inspector involvement in post-repair inspections to CSEF weld repairs is to ensure future safe operation of the boiler. This is a function of the inservice Authorized Inspection Agency, not the Repair Inspector, whose duties end with completion of repair documentation.

Background Information

The post-repair inspection requirements specified in S8.5 are unique. There is no other mention of such inspections elsewhere in NBIC–Part 3. Presumably, Welding Method 6 repairs don't require post-repair inspection due to the perceived low-level of associated risk (inside the boiler setting).

Existing Text	**Proposed Text**
After the completion of weld repairs to CSEF steels, post inspection requirements shall be developed and implemented based on acceptance from the Inspector, and if applicable, the Jurisdiction.	After the completion of weld repairs to CSEF steels, post inspection requirements shall be developed and implemented based on acceptance from the inservice Authorized Inspection Agency of the pressure retaining item ~~Inspector~~, and if applicable, the Jurisdiction.

	VOTE:						
COMMITTEE	Approved	Disapproved	Abstained	Not Voting	Passed	Failed	Date

PROPOSED REVISION OR ADDITION

Item No.

A 21-67

Subject/Title

Add welding requirements to plugging firetubes

NBIC Location

Part: Repairs and Alterations; Section: 3; Paragraph: 3.4.9

Project Manager and Task Group

Source (Name/Email)

Kathy Moore / kathymoore@joemoorecompany.com

Statement of Need

The current NBIC does not have enough direction or requirements for welding tube plugs in fitretubes

Background Information

Improper welding of tube plugs in firetubes often creates ligament cracks.

Existing Text	Proposed Text
	Needs to be created

	VOTE:						
COMMITTEE	Approved	Disapproved	Abstained	Not Voting	Passed	Failed	Date

S9.2 FORM R-1, REPORT OF REPAIR, NB-66

FIGURE S9.2.1
FORM R-1, PAGE 1 OF 2

THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

NB-66, Rev. 16, (02/04/21)

FORM R-1 REPORT OF REPAIR
in accordance with provisions of the *National Board Inspection Code*

(1) (Authorized Rep. initials)
(2) (Inspectors initials)
(3) (Form "R" Registration no.)
(4) (P.O. no., job no., etc.)

1. WORK PERFORMED BY: (5) (name of repair organization)
(address)
2. OWNER: (6) (name)
(address)
3. LOCATION OF INSTALLATION: (7) (name)
(address)
4. ITEM IDENTIFICATION: (8) (boiler, pressure vessel, or piping) NAME OF ORIGINAL MANUFACTURER: (9)
5. IDENTIFYING NOS: (10) (mfg. serial no.) (11) (National Board no.) (12) (jurisdiction no.) (13) (other) (14) (year built)
6. NBIC EDITION/ADDENDA: (15) (edition) (addenda)
Original Code of Construction for Item: (16) (name / section / division) (edition / addenda)
Construction Code Used for Repair Performed: (17) (name / section / division) (edition / addenda)
7. REPAIR TYPE: (18) ☐ welded ☐ graphite pressure equipment ☐ FRP pressure equipment ☐ DOT
8. DESCRIPTION OF WORK: (use Form R-4, if necessary) ☐ Form R-4, Report Supplement Sheet is attached ☐ FFSA Form (NB-403) is attached
(19)
(20) (Liquid, Pneumatic, Vacuum, Leak) Pressure Test, if applied (21) psi MAWP (22) psi
9. REPLACEMENT PARTS: (Attached are Manufacturer's Partial Data Reports or Form R-3's properly completed for the following items of this report):
(name of part, item number, data report type or Certificate of Compliance, mfg's. name and identifying stamp)
(23)
10. REMARKS: (24)

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FIGURE S9.2.2
FORM R-1, PAGE 2 OF 2

THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

NB-66, Rev. 16, (02/04/21)

(25) _____
(Form "**R**" Registration no.)

(26) _____
(P.O. no., job no., etc.)

CERTIFICATE OF COMPLIANCE

I, (27) _____, certify that to the best of my knowledge and belief the statements made in this report are correct and that all material, construction, and workmanship on this Repair conforms to the *National Board Inspection Code*. National Board "**R**" *Certificate of Authorization* No. (28) _____ Expiration date: (29) _____

Repair Organization: (30) _____

Signed: (31) _____
(authorized representative)

Date: (32) _____

CERTIFICATE OF INSPECTION

I, (33) _____, holding a valid commission issued by The National Board of Boiler and Pressure Vessel Inspectors and certificate of competency, where required, issued by the Jurisdiction of (34) _____ and employed by (35) _____ of (36) _____ have inspected the work described in this report on ~~(37)~~ _____, and state that to the best of my knowledge and belief, this work complies with the applicable requirements of the *National Board Inspection Code*. By signing this certificate, neither the undersigned nor my employer makes any warranty, expressed or implied, concerning the work described in this report. Furthermore, neither the undersigned nor my employer shall be liable in any manner for any personal injury, property damage, or loss of any kind arising from or connected with this inspection.

Commissions: ~~(38)~~ 37
(National Board and Jurisdiction no. including endorsement)

Signed: ~~(39)~~ 38
(Inspector)

Date: ~~(40)~~ 39

This form may be obtained from The National Board of Boiler and Pressure Vessel Inspectors • 1055 Crupper Avenue, Columbus, Ohio 43229-1183 Page 2 of 2

TABLE S9.2
GUIDE FOR COMPLETING FORM R-1, REPORT OF REPAIR, NB-66

Reference to Circled Numbers in the Form	Description
(1)	Initials of the authorized representative of the "R" Certificate Holder.
(2)	Initials of the Inspector reviewing the "R" Certificate Holders work.
(3)	When registering a Form R-1 Report with the National Board, this line is solely designated for a unique sequential number assigned by the "R" Certificate Holder. When the "R" Form is not to be registered, indicate so by "N/A". As described in NBIC Part 3, 5.6, a log shall be maintained identifying sequentially, any Form "R" registered with the National Board.
(4)	If applicable, document the unique purchase order, job, or tracking number assigned by the organization performing the work.
(5)	The name and address of the National Board "R" Certificate Holder performing the work as it appears on the "*Certificate of Authorization*".
(6)	Name and address of the owner of the pressure-retaining item.
(7)	Name and address of plant or facility where the pressure-retaining item is installed.
(8)	Description of the pressure-retaining item, such as boiler or pressure vessel, or piping. Include the applicable unit identification.
(9)	Name of the original manufacturer of the pressure-retaining item. If the original manufacturer is unknown, indicate by, "unknown."
(10)	Document the serial number of the pressure-retaining item if assigned by the original manufacturer. If there is no serial number assigned or is unknown, indicate "unknown."
(11)	When the pressure-retaining item is registered with the National Board, document the applicable registration number. If the pressure-retaining item is installed in Canada, indicate the Canadian design registration number (CRN), and list the drawing number under "other." If the item is not registered, indicate, "none."
(12)	Indicate the jurisdiction number assigned to the pressure retaining item, if available.
(13)	Indicate any other unique identifying nomenclature assigned to the pressure retaining item by the owner or user.
(14)	Identify the year in which fabrication/construction of the pressure retaining item was completed.
(15)	Indicate edition and addenda of the NBIC under which this work is being performed.
(16)	Indicate the name, section, division, edition, and addenda (if applicable) of the original code of construction for the pressure-retaining item.

TABLE S9.2 CONT'D

Reference to Circled Numbers in the Form	Description
(17)	Indicate the name, section, division, edition, and addenda (if applicable) of the construction code used for the work being performed. If code cases are used, they shall be identified in the "Remarks" section.
(18)	Check the repair type performed on the pressure retaining item.
(19)	Provide a detailed summary describing the scope of work that was completed to a pressure retaining item (PRI). The information to be considered when describing the scope of work should include such items as, the nature of the repair (i.e. welding, bonding, cementing), the specific location of the work performed to the PRI, the steps taken to remove a defect or as allowed by 3.3.4.8 to remain in place, the method of repair described as listed in the examples of Part 3, Section 3 or supplemental section if applicable, and the acceptance testing and or examination method used in accordance with the NBIC. When additional space is required to describe the scope of work, a Form R-4 shall be used and attached (check box). If a FITNESS FOR SERVICE Form (NB-403) is part of the Form R-1 repair package, check box and attach the form. Information determined to be of a proprietary nature need not be included, but shall be stated on the form.
(20)	Indicate type of pressure test applied (Liquid, Pneumatic, Vacuum, Leak). If no pressure test applied, indicate "none."
(21)	Indicate test pressure applied.
(22)	Indicate maximum allowable working pressure (MAWP) for the pressure retaining item, if known.
(23)	As applicable, identify what Replacement Parts manufactured by welding or bonding were introduced as needed to complete the scope of work. Indicate part, item number, manufacturer's name, stamped identification, and data report type or Certificate of Compliance.
(24)	Indicate any additional information pertaining to the work involved (e.g., routine repairs, code cases).
(25)	When registering a Form R-1 Report with the National Board, this line is solely designated for a unique sequential number assigned by the "R" Certificate Holder. When the "R" Form is not to be registered, indicate so by "N/A". As described in NBIC Part 3, 5.6, a log shall be maintained identifying sequentially, any Form "R" registered with the National Board.
(26)	If applicable, document the unique purchase order, job, or tracking number assigned by organization performing work.
(27)	Type or print name of authorized representative of the "R" Certificate Holder attesting to accuracy of the work described.
(28)	Indicate National Board "R" *Certificate of Authorization* number.
(29)	Indicate month, day, and year that the "R" *Certificate of Authorization* expires.

TABLE S9.2 CONT'D

Reference to Circled Numbers in the Form	Description
(30)	Record name of "R" Certificate Holder who performed the described work, using full name as shown on the *Certificate of Authorization* or an abbreviation acceptable to the National Board.
(31)	Signature of "R" Certificate Holder authorized representative.
(32)	Enter month, day, and year repair certified.
(33)	Type or print name of Inspector.
(34)	Indicate Inspector's Jurisdiction.
(35)	Indicate Inspector's employer.
(36)	Indicate address of Inspector's employer (city and state or province).
~~(37)~~	~~Indicate month, day, and year of final inspection by Inspector. For routine repairs this shall be the month, day, and year the Inspector reviews the completed routine repair package~~.
~~(38)~~ 37	Inspector's National Board commission number and endorsement that qualifies the Inspector to sign this report, and when required by the Jurisdiction, the applicable State or Provincial numbers.
~~(38)~~ 38	Signature of Inspector.
~~(40)~~ 39	Indicate month, day, and year of Inspector signature

SUPPL. 9

S9.3 FORM R-2, REPORT OF ALTERATION, NB-229

FIGURE S9.3.1
FORM R-2, PAGE 1 OF 2

THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

NB-229, Rev. 8, (03/04/21)

FORM R-2 REPORT OF ALTERATION
in accordance with provisions of the *National Board Inspection Code*

(1) (Authorized Rep. initials)
(2) (Inspectors initials)
(3) (Form "R" Registration no.)
(4) (P.O. no., job no., etc.)

1a. DESIGN PERFORMED BY: (5) (name of "R" organization responsible for design)
(address)

1b. CONSTRUCTION PERFORMED BY: (6) (name of "R" organization responsible for construction)
(address)

2. OWNER OF PRESSURE RETAINING ITEM: (7) (name)
(address)

3. LOCATION OF INSTALLATION: (8) (name)
(address)

4. ITEM IDENTIFICATION: (9) (boiler, pressure vessel, or piping) NAME OF ORIGINAL MANUFACTURER: (10)

5. IDENTIFYING NOS: (11) (mfg. serial no.) (12) (National Board no.) (13) (jurisdiction no.) (14) (other) (15) (year built)

6. NBIC EDITION/ADDENDA: (16) (edition) (16) (addenda)

Original Code of Construction for Item: (17) (name / section / division) (17) (edition / addenda)

Construction Code Used for Alteration Performed: (18) (name / section / division) (18) (edition / addenda)

7a. DESCRIPTION OF DESIGN SCOPE: ☐ Form R-4, Report Supplement Sheet is attached
(19)

7b. DESCRIPTION OF CONSTRUCTION SCOPE: ☐ Form R-4, Report Supplement Sheet is attached
(20)

(21) Pressure Test, if applied (22) psi MAWP (23) psi

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FIGURE S9.3.2
FORM R-2, PAGE 2 OF 2

THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

NB-229, Rev. 8, (03/04/21)

(24) (Form "R" Registration no.)

(25) (P.O. no., job no., etc.)

8. REPLACEMENT PARTS: (Attached are Manufacturer's Partial Data Reports or Form R-3's properly completed for the following items of this report):

(name of part, item number, data report type or Certificate of Compliance, mfg's. name and identifying stamp)

(26)

9. REMARKS: (27)

DESIGN CERTIFICATION

I, (28), certify that to the best of my knowledge and belief the statements in this report are correct and that the Design Change described in this report conforms to the *National Board Inspection Code*. National Board "**R**" Certificate of Authorization No. (29) expires on (30)

Date (31), (32) (name of design organization) Signed (33) (authorized representative)

CERTIFICATE OF DESIGN CHANGE REVIEW

I, (34), holding a valid Commission issued by The National Board of Boiler and Pressure Vessel Inspector and certificate of competency, where required, issued by the jurisdiction of (35) and employed by (36) of (37) have reviewed the design change as described in this report and state that to the best of my knowledge and belief such change complies with the applicable requirements of the *National Board Inspection Code*.

By signing this certificate, neither the undersigned nor my employer makes any warranty, expressed or implied, concerning the work described in this report. Furthermore, neither the undersigned nor my employer shall be liable in any manner for any personal injury, property damage or loss of any kind arising from or connected with this inspection.

Date (38) Signed (39) (inspector) Commissions (40) (National Board and jurisdiction no. including endorsement)

CONSTRUCTION CERTIFICATION

I, (41), certify that to the best of my knowledge and belief the statements in this report are correct and that all material, construction, and workmanship on this Alteration conforms to the National Board Inspection Code. National Board "**R**" Certificate of Authorization No. (42) expires on (43)

Date (44), (45) (name of alteration organization) Signed (46) (authorized representative)

CERTIFICATE OF INSPECTION

I, (47), holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and certificate of competency, where required, issued by the Jurisdiction of (48) and employed by (49) of (50) have inspected the work described in this report on (51), and state that to the best of my knowledge and belief, this work complies with the applicable requirements of the National Board Inspection Code. By signing this certificate, neither the undersigned nor my employer makes any warranty, expressed or implied, concerning the work described in this report. Furthermore, neither the undersigned nor my employer shall be liable in any manner for any personal injury, property damage, or loss of any kind arising from or connected with this inspection.

Date (52) 51 Signed (53) ~~51~~ 52 (inspector) (54) ~~53~~ 53 (National Board and jurisdiction no. including endorsement)

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TABLE S9.3
GUIDE FOR COMPLETING FORM R-2, REPORT OF ALTERATION, NB-226

Reference to Circled Numbers in the Form	Description
(1)	Initials of the National Board "R" Certificate of Authorization authorized representative who registers the Form R-2.
(2)	Initials of the Inspector who certified the completed Form R-2 for registration.
(3)	When registering a Form R-2 with the National Board, this line is solely designated for a unique sequential number assigned by the "R" Certificate Holder. As described in NBIC Part 3, Paragraph 5.6, a log shall be maintained identifying unique and sequentially numbered Form "R" reports that are registered with the National Board. For rerating only, the Design Organization registers the Form R-2.
(4)	If applicable, document the unique purchase order, job, or tracking number assigned by the organization performing the work.
(5)	The name and address of the National Board "R" *Certificate of Authorization* holder performing the design as it appears on the "*Certificate of Authorization*".
(6)	The name and address of the National Board "R" Certificate of Authorization holder performing the construction activity as it appears on the "Certificate of Authorization."
(7)	Name and address of the owner of the pressure-retaining item.
(8)	Name and address of the plant or facility where the pressure-retaining item is installed.
(9)	Description of the pressure-retaining item, such as boiler or pressure vessel, or piping. Include the applicable unit identification.
(10)	Name of the original manufacturer of the pressure-retaining item. If the original manufacturer is unknown, indicate by, "unknown."
((11)	Document the serial number of the pressure-retaining item if assigned by the original manufacturer. If there is no serial number assigned or it is unknown, indicate "unknown."
(12)	When the pressure-retaining item is registered with the National Board, document the applicable registration number. If the pressure-retaining item is installed in Canada, indicate the Canadian design, registration number (CRN), and list the drawing number under "other." If the item is not registered, indicate, "none."
(13)	Indicate the jurisdiction number assigned to the pressure retaining item, if available.
(14)	Indicate any other unique identifying nomenclature assigned to the pressure retaining item by the owner or user.
(15)	Identify the year in which fabrication/construction of the pressure retaining item was completed.

TABLE S9.3 CONT'D

Reference to Circled Numbers in the Form	Description
(16)	Indicate edition and addenda of the NBIC under which this work is being performed, as applicable.
(17)	Indicate the name, section, division, edition, and addenda (if applicable) of the original code of construction for the pressure-retaining item.
(18)	Indicate the name, section, division, edition, and addenda (if applicable) of the construction code used for the work being performed. If code cases are used, they shall be identified in the "Remarks" section.
(19)	Provide a detailed summary of the scope of design that was performed. When additional space is required to describe the design scope, a Form R-4 shall be used and attached (check box if needed).
(20)	The information to be considered when describing the construction scope of work should include such items as, the nature of the alteration (i.e. welding, bonding, cementing), the specific location of the work performed to the pressure retaining item, the steps taken to remove a defect or as allowed by NBIC Part 3, Paragraph 3.3.4.8 to remain in place, and the method of alteration described as listed in the examples of NBIC Part 3, Paragraph 3.4.4 or applicable supplement. When additional space is required to describe the construction scope, a Form R-4 shall be used and attached (check box if needed).
(21)	Indicate type of pressure test applied (liquid, pneumatic, vacuum, leak). If no pressure test applied, indicate "none."
(22)	Indicate test pressure applied.
(23)	Indicate maximum allowable working pressure (MAWP) for the pressure retaining item. (As altered)
(24)	When registering a Form R-2 with the National Board, this line is solely designated for a unique sequential number assigned by the "R" Certificate Holder. As described in NBIC Part 3, Paragraph 5.6, a log shall be maintained identifying unique and sequentially numbered Form "R" reports that are registered with the National Board. For rerating only, the Design Organization registers the Form R-2.
(25)	If applicable, document the unique purchase order, job, or tracking number assigned by organization performing work.
(26)	As applicable, identify what parts manufactured by welding or bonding were introduced as needed to complete the scope of work. Indicate part, item number, manufacturer's name, stamped identification, and data report type or Certificate of Compliance.
(27)	Indicate any additional information pertaining to the work involved (e.g. code cases, interpretations used).
(28)	Type or print name of the National Board "R" *Certificate of Authorization* authorized representative responsible for design certification.

TABLE S9.3 CONT'D

Reference to Circled Numbers in the Form	Description
(29)	Indicate National Board "R" *Certificate of Authorization* number.
(30)	Indicate month, day, and year that the "R" *Certificate of Authorization* expires.
(31)	Indicate month, day, and year the alteration was certified.
(32)	Record the name of National Board "R" *Certificate of Authorization* holder who performed the design portion of the work, using full name as shown on the "*Certificate of Authorization*" or an abbreviation acceptable to the National Board.
(33)	Signature of National Board "R" *Certificate of Authorization* authorized representative for the design change.
(34)	Type or print the name of Inspector certifying the design review.
(35)	Indicate Inspector's Jurisdiction.
(36)	Indicate Inspector's employer.
(37)	Indicate address of Inspector's employer (city and state or province).
(38)	Indicate the month, day and year of the design certification by the Inspector.
(39)	Signature of the Inspector certifying the design review.
(40)	Inspectors National Board commission number and endorsement that qualifies the Inspector to sign this report, and when required by the Jurisdiction, the applicable State or Provincial numbers.
(41)	Type or print name of the National Board "R" *Certificate of Authorization* authorized representative responsible for any construction.
(42)	Indicate the National Board "R" *Certificate of Authorization* number.
(43)	Indicate month, day, and year the National Board "R" *Certificate of Authorization* expires.
(44)	Indicate the date the alteration was certified.
(45)	Record the name of National Board "R" *Certificate of Authorization* holder who performed the construction portion of the described work, using full name as shown on the *Certificate of Authorization* or an abbreviation acceptable to the National Board.
(46)	Signature of National Board "R" *Certificate of Authorization* authorized representative.
(47)	Type or print the name of Inspector certifying the construction inspection.
(48)	Indicate the Inspector's Jurisdiction.
(49)	Indicate Inspector's employer.
(50)	Indicate address of Inspector's employer (city and state or province).

TABLE S9.3 CONT'D

Reference to Circled Numbers in the Form	Description
~~(51)~~	~~Indicate the month, day and year of the final inspection by the Inspector.~~
~~(52)~~ 51	Indicate the month, day and year the completed Form R-2 was signed by the Inspector.
~~(53)~~ 52	Signature of the Inspector certifying the construction inspection.
~~(54)~~ 53	Inspector's National Board commission number and endorsement that qualifies the Inspector to sign this report, and when required by the Jurisdiction, the applicable State or Provincial numbers.

S9.4 FORM R-3, REPORT OF PARTS FABRICATED BY WELDING, NB-230

FIGURE S9.4.1
FORM R-3, PAGE 1 OF 2

THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

NB-230, Rev. 4 (12/08/16)

FORM R-3 REPORT OF PARTS FABRICATED BY WELDING
in accordance with provisions of the *National Board Inspection Code*

(1) (Authorized Rep. initials)
(2) (Inspectors initials)
(3) (Form "R-3" Registration no.)
(5) (P.O. no., job no., etc.)

1. MANUFACTURED BY: (4) (name of "R" certificate holder)
(address)
2. MANUFACTURED FOR: (6) (name)
(address)
3. DESIGN CONDITION SPECIFIED BY: (7) CODE DESIGN BY: (8)
4. DESIGN CODE: (9) (10) (11) (12)
5. REPAIR/ALTERATION/MODIFICATION ACTIVITIES

Name of Part	Qty.	Line No.	Manufacturer's Identifying No.	Manufacturer's Drawing No.	MAWP	Shop Hydro PSI	Year Built
(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)

6. DESCRIPTION OF PARTS

	(a) Connections other than tubes			Heads or Ends			(b) Tubes		
Line No.	Size and Shape	Material Spec. No.	Thickness (in.)	Shape	Thickness (in.)	Material Spec. No.	Diameter (in.)	Thickness (in.)	Material Spec. No.
(15)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)

7. REMARKS: (30)

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FIGURE S9.4.2
FORM R-3, PAGE 2 OF 2

THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

NB-230, Rev. 4 (12/08/16)

(31) _____
(Form "R-3" Registration no.)

(32) _____
(P.O. no., job no., etc.)

CERTIFICATE OF COMPLIANCE

I, (33) _____, certify that to the best of my knowledge and belief the statements made in this report are correct and that all material, fabrication, construction, and workmanship of the described parts conforms to the *National Board Inspection Code* and the standards of construction cited.

National Board "**R**" *Certificate of Authorization* No. (34) _____ expires on: (35) _____, _____

Date (36) _____, _____ (37) _____ Signed (38) _____

(name of "R" Certificate holder) (Authorized Representative)

CERTIFICATE OF INSPECTION

I, (39) _____, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and certificate of competency, where required, issued by the Jurisdiction of (40) _____ and employed by (41) _____ of (42) _____ have inspected the part described in this report on (43) _____, _____ and state that to the best of my knowledge and belief the parts comply with the applicable requirements of the *National Board Inspection Code*.

By signing this certificate, neither the undersigned nor my employer makes any warranty, expressed or implied, concerning the work described in this report. Furthermore, neither the undersigned nor my employer shall be liable in any manner for any personal injury, property damage, or loss of any kind arising from or connected with this inspection.

Date (44) 43, _____ Signed (45) 44 Commissions (46) 45

(inspector) (National Board and jurisdiction No. including endorsement)

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TABLE S9.4

GUIDE FOR COMPLETING FORM R-3, REPORT OF PARTS FABRICATED BY WELDING, NB-230

Reference to Circled Numbers in the Form	Description
(1)	Initials of the National Board "R" *Certificate of Authorization* authorized representative who registers the Form R-3.
(2)	Initials of the Inspector who certified the completed Form R-3 for registration.
(3)	When registering a Form R-3 Report with the National Board, this line is solely designated for a unique sequential number assigned by the "R" Certificate Holder. When the "R" Form is not to be registered, indicated so by "N/A". As described in NBIC Part 3, Paragraph 5.6, a log shall be maintained identifying unique and sequentially numbered Form "R" reports that are registered with the National Board.
(4)	The name and address of the National Board "R" Certificate Holder who manufactured the welded parts as it appears on the "*Certificate of Authorization.*"
(5)	If applicable, document the unique purchase order, job, or tracking number assigned by organization performing work.
(6)	Document name and address of organization that purchased the parts for incorporation into the repair or alteration. If the part's origin is unknown or the part was built for stock, so state.
(7)	Document name of organization responsible for specifying the code design conditions, if known. If origin of design conditions are not known, state "unknown."
(8)	Document name of organization responsible for performing the code design, if known. If code design organization is not known, state "unknown."
(9)	Name, section, and division of the design code, if known. If the design is not known, state "unknown."
(10)	Indicate code edition year used for fabrication.
(11)	Indicate code addenda date used for fabrication, if applicable.
(12)	Indicate the code paragraph reference for formula used to establish the MAWP, if known. If the code reference of the formula is not known, state "unknown."
(13)	If available, identify component by part's original name, function, or use the original equipment manufacturer's "mark or item number."
(14)	Indicate quantity of named parts.
(15)	Match line number of part references for Identification of Parts in item 5 and the Description of Parts in item 6.
(16)	Indicate manufacturer's serial number or identification number for the named part.

TABLE S9.4 CONT'D

Reference to Circled Numbers in the Form	Description
(17)	Indicate drawing number for the named part.
(18)	Indicate maximum allowable working pressure (MAWP) for the part, if known.
(19)	Indicate test pressure, if applied.
(20)	Identify the year in which fabrication/construction of the item was completed.
(21)	Use inside diameter for size: indicate shape as square, round, etc.
(22)	Indicate the complete material specification number and grade.
(23)	Indicate nominal thickness of plate and minimum thickness after forming.
(24)	Indicate shape as flat, dished, ellipsoidal, or hemispherical.
(25)	Indicate minimum thickness after forming.
(26)	Indicate the complete material specification number and grade for the head or end.
(27)	Indicate outside diameter.
(28)	Indicate minimum thickness of tubes.
(29)	Indicate the complete material specification number and grade for tubes.
(30)	Indicate any additional information pertaining to the work involved (e.g. code cases). The part manufacturer is to indicate the extent he has performed any or all of the design function. If only a portion of the design, state which portion.
(31)	When registering a Form R-3 Report with the National Board, this line is solely designated for a unique sequential number assigned by the "R" Certificate Holder. When the "R" Form is not to be registered, indicated so by "N/A". As described in NBIC Part 3, Paragraph 5.6, a log shall be maintained identifying unique and sequentially numbered Form "R" reports that are registered with the National Board.
(32)	If applicable, document the unique purchase order, job, or tracking number assigned by organization performing work.
(33)	Type or print name of authorized representative of the "R" Certificate Holder attesting to accuracy of the work described.
(34)	Indicate National Board "R" Certificate of Authorization number.
(35)	Indicate month, day, and year that the "R" Certificate of Authorization expires.
(36)	Indicate the date the repair was certified.
(37)	Record name of "R" Certificate Holder who performed the described work, using full name as shown on the Certificate of Authorization or an abbreviation acceptable to the National Board.

TABLE S9.4 CONT'D

Reference to Circled Numbers in the Form	Description
(38)	Signature of National Board "R" Certificate of Authorization authorized representative.
(39)	Type or print name of Inspector.
(40)	Indicate Inspector's Jurisdiction.
(41)	Indicate Inspector's employer.
(42)	Indicate address of Inspector's employer (city and state or province).
~~(43)~~	~~Indicate month, day, and year of final inspection by Inspector.~~
~~(44)~~ 43	Indicate the month, day and year the completed Form "R" was signed by the Inspector.
~~(45)~~ 44	Signature of Inspector.
~~(46)~~ 45	Inspector's National Board commission number and endorsement that qualifies the Inspector to sign this report, and when required by the Jurisdiction, the applicable State or Provincial numbers.

S9.5 FORM R-4, REPORT SUPPLEMENT SHEET, NB-231

FIGURE S9.5.1
FORM R-4, PAGE 1 OF 1

THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

NB-231, Rev. 3, (12/08/16)

FORM R-4 REPORT SUPPLEMENT SHEET

in accordance with provisions of the *National Board Inspection Code*

(1) _____ (form "R" referenced)

(2) _____ (P.O. no., job no., etc.)

1. WORK PERFORMED BY: (3) _____ (name)

_____ (address)

2. OWNER: (4) _____ (name)

_____ (address)

3. LOCATION OF INSTALLATION: (5) _____ (name)

_____ (address)

REFERENCE LINE NO. CONTINUED FROM FORM R– (6) _____

(7)	(8)

Date (9) _____, _____ Signed (10) _____ (authorized representative) Name (11) _____ (Name of "R" certificate holder)

Date (12) _____, _____ Signed (13) _____ (inspector) Commissions (14) _____ (National Board and jurisdiction no. including endorsement)

This form may be obtained from The National Board of Boiler and Pressure Vessel Inspectors • 1055 Crupper Avenue, Columbus, Ohio 43229-1183 Page 1 of 1

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TABLE S9.5
GUIDE FOR COMPLETING FORM R-4, REPORT SUPPLEMENT SHEET, NB-231

Reference to Circled Numbers in the Form	Description
(1)	When registering a Form "R" Report with the National Board, this line is solely designated for a unique sequential number assigned by the "R" Certificate Holder. When the "R" Form is not to be registered, indicate so by "N/A". As described in NBIC Part 3, Paragraph 5.6, a log shall be maintained identifying unique and sequentially numbered Form "R" reports that are registered with the National Board. Complete information identical to that shown on the Form "R" to which this sheet is a supplement.
(2)	If applicable, document the unique purchase order, job, or tracking number, assigned by the organization performing work.
(3)	The name and address of the Certificate Holder performing the work as it appears on the "Certificate of Authorization."
(4)	Name and address of the owner of the pressure-retaining item.
(5)	Name and address of plant or facility where the pressure-retaining item is installed.
(6)	Indicate the Form "R" type to which this report is supplementary. Example: Form R-1, Form R-2, Form R-3
(7)	Indicate the reference line number from the Form "R" to which this report is supplementary.
(8)	Complete information for which there was insufficient space on the reference Form "R".
(9)	Indicate the date certified.
(10)	Signature of the repair organizations authorized representative.
(11)	Record name of "R" Certificate Holder who performed the described work, using full name as shown on the Certificate of Authorization or an abbreviation acceptable to the National Board.
(12)	Indicate the date the form was completed by the Inspector.
(13)	Signature of the Inspector.
(14)	Inspector's National Board commission number and endorsement that qualifies the Inspector to sign this report, and when required by the Jurisdiction, the applicable State or Provincial numbers.

S9.6 FORM NR-1, REPORT OF REPAIR/REPLACEMENT ACTIVITIES FOR NUCLEAR FACILITIES, NB-81

FIGURE S9.6.1
FORM NR-1, PAGE 1 OF 3

THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

NB-81, Rev. 8, (03/04/21)

FORM NR-1, REPORT OF REPAIR/REPLACEMENT ACTIVITIES FOR NUCLEAR FACILITIES

CATEGORY OF ACTIVITY: 1 ☐ 2 ☐ 3 ☐

☐ REPAIR/REPLACEMENT ☐ RE-RATING

(2) (NR Form Registration No.)

(3) (R/R Plan No., Job No., etc.)

1. WORK PERFORMED BY: (1) (name of "NR" certificate holder)

(address)

2. OWNER: (4) (name)

(address)

3. NAME, ADDRESS, AND IDENTIFICATION OF NUCLEAR FACILITY:

(5) (name)

(address)

(unit identification)

4. SYSTEM/COMPONENT: (6) ORIGINAL DESIGN SPECIFICATION NO./REV.: (7)

5. CONSTRUCTION CODE, SECTION & EDITION/ADDENDA AND APPLICABLE CODE CASES USED FOR THE SYSTEM OR COMPONENT: (8)

6. NBIC EDITION USED FOR PERFORMING REPAIRS/REPLACEMENT OR RE-RATING ACTIVITY: (9)

7. DESIGN RESPONSIBILITY: (10) CODE and ED/AD: (11)

8. TESTS CONDUCTED: ☐ Hydrostatic ☐ Pneumatic ☐ System Leakage ☐ Pressure _____ psi (MPa)
(12) ☐ Exempt ☐ Other

9. NUMBER OF COMPONENTS REPAIRED/REPLACED AND/OR RE-RATED (refer to page 2): (13)

10. DESCRIPTION OF WORK (use of properly identified additional sheet[s] or sketch[es] is acceptable):
(14)

11. REMARKS: (15)

This form may be obtained from The National Board of Boiler and Pressure Vessel Inspectors • 1055 Crupper Avenue, Columbus, Ohio 43229-1183 Page 1 of 3

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FIGURE S9.6.2
FORM NR-1, PAGE 2 OF 3

THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

NB-81, Rev. 8, (03/04/21)

(2) (**NR** Form Registration No.)

(3) (R/R Plan No., Job No., etc.)

WORK PERFORMED BY: (1)

(Name of "**NR**" certificate holder)

(Address of "**NR**" certificate holder)

COMPONENT IDENTIFICATION

No. (16)	Type of Item (17)	Mfg. Name (18)	Serial No. (19)	Nat'l Bd No. (20)	Code Class (21)	Code Section (22)	Year/ Addenda (23)	Code Case (24)	Revised Design Specification No./Rev. or Design Reconciliation No./Rev. (25)

FIGURE S9.6.3
FORM NR-1, PAGE 3 OF 3

THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

NB-81, Rev. 8, (03/04/21)

(**NR** Form Registration No.)

(R/R Plan No., Job No., etc.)

CERTIFICATE OF COMPLIANCE

I, (26) _____, employed by (27) _____
certify that to the best of my knowledge and belief the statements made in this report are correct and the repair/replacement activities or re-rating described above conform to (28) _____ and the *National Board Inspection Code* "**NR**" rules.

National Board *Certificate of Authorization* No. (29) _____ Expiration date: (30) _____

Signed: (31) _____ Date: (32) _____

Title: (33) _____
(authorized representative)

CERTIFICATE OF INSPECTION

I, (34) _____, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and certificate of competency, where required, issued by the Jurisdiction of (35) _____ and employed by (36) _____ have inspected the repair/replacement and/or re-rating activities described in this report on (37) _____ and state that to the best of my knowledge and belief, these activities have been completed in accordance with the Code specified and the *National Board Inspection Code* "**NR**" rules.

By signing this certificate, neither the undersigned nor my employer makes any warranty, expressed or implied, concerning the work described in this report. Furthermore, neither the undersigned nor my employer shall be liable in any manner for any personal injury, property damage, or loss of any kind arising from or connected with this inspection.

Signed: ~~(38)~~ 37 Date: ~~(39)~~ 38 Commissions ~~(40)~~ 39
(inspector) (National Board and endorsement)

This form may be obtained from The National Board of Boiler and Pressure Vessel Inspectors • 1055 Crupper Avenue, Columbus, Ohio 43229-1183 Page 3 of 3

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TABLE S9.6

GUIDE FOR COMPLETING FORM NR-1, REPORT OF REPAIR/REPLACEMENT ACTIVITIES FOR NUCLEAR FACILITIES, NB-81

Reference to Circled Numbers in the Form	Description
	Title Block: Check type of activity, repair/replacement and/or rerating, as applicable.
	Check category of activity, 1, 2, or 3, as described in Part 3, Paragraph 1.6.2.
(1)	Name and address of the organization, as shown on the National Board "NR" Certificate of Authorization, which performed the activity.
(2)	Indicate NR Form Registration Number.
(3)	Indicate the repair/replacement plan, job number, etc., as applicable, assigned by the organization that performed the work for traceability to documentation.
(4)	Name and address of the owner of the nuclear facility.
(5)	Name and address of the nuclear power plant and, if applicable, identification of the unit.
(6)	Identify the system or component (e.g., residual heat removal, reactor coolant) with which the repair/replacement and/or re-rating activity is associated.
(7)	Identify the original design specification number and revision for the system or component listed in line 4.
(8)	Identify the original construction code, section, edition/addenda and applicable code cases used for the system or component identified in line 4.
(9)	NBIC Edition used for performing activities specified on this form.
(10)	Organization having responsibility for design when there is a change from the original design specification.
(11)	Identify code, section, edition/addenda and applicable code cases used for design, when applicable.
(12)	Check the type of test conducted (e.g., hydrostatic, pneumatic, system leakage, exempt, or other) and indicate the pressure applied when applicable.
(13)	Indicate the number of components where work was performed. Each component shall be indicated on page 2 of the form NR-1.
(14)	Provide a detailed summary describing the scope of work completed. Information to be considered should include type of work (welding, brazing, fusing), location, steps taken for removal or acceptance of defects, examinations, testing, heat treat, and other special processes or methods utilized. If Necessary, attach additional data, sketch, drawing, Form R-4, etc. In the remarks section state if additional data is attached.
(15)	Indicate any additional information pertaining to the work, including manufacturer's data reports.

TABLE S9.6 CONT'D

Reference to Circled Numbers in the Form	Description
(16)	Number in sequence beginning with No. 1 to identify each component work was performed. This number may be used to correspond with the detailed description of work performed.
(17)	Identify the type of item. i.e. piping, pump, valve, etc.
(18)	Identify the manufacturer's name of component.
(19)	Identify the manufacturer's serial no. or other assigned number for traceability.
(20)	Identify the National Board registration number, if previously assigned.
(21)	Identify the code class criteria, as assigned for each component.
(22)	Identify the code section used to perform work.
(23)	Identify Code section year and/or addenda used to perform work.
(24)	Identify any code cases used for work performed.
(25)	Identify any revisions to be made to the design specifications or if any design reconciliations were performed.
(26)	Type or print name of authorized representative from the certificate holder.
(27)	Name of the organization that performed the identified work, using the full name as shown on the Certificate of Authorization, or an abbreviation acceptable to the National Board.
(28)	Indicate code section as applicable to the repair/replacement activity and/or re-rating activity performed.
(29)	Indicate National Board Certificate of Authorization number.
(30)	Indicate month, day, and year the certificate expires.
(31)	Signature of authorized representative from the NR certificate holder.
(32)	Indicate month, day and year of signature by the Authorized Representative.
(33)	Title of authorized representative as defined in the Quality Program.
(34)	Type or print name of Authorized Nuclear Inspector.
(35)	Indicate the Jurisdiction where the activity is performed, when required.
(36)	Indicate Authorized Nuclear Inspector's employer.
~~(37)~~	~~Indicate month, day, and year of inspection by the Authorized Nuclear Inspector.~~

TABLE S9.6 CONT'D

Reference to Circled Numbers in the Form	Description
~~(38)~~ 37	Signature of Authorized Nuclear Inspector.
~~(39)~~ 38	Indicate month, day, and year of signature by the Authorized Nuclear Inspector.
~~(40)~~ 39	National Board Commission number and required endorsements.

S9.7 FORM NVR-1, REPORT OF REPAIR/REPLACEMENT ACTIVITIES FOR NUCLEAR PRESSURE RELIEF DEVICES, NB-160

FIGURE S9.7.1
FORM NVR-1, PAGE 1 OF 3

THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

NB-160, Rev. 8, (03/30/17)

FORM NVR-1, REPORT OF REPAIR/REPLACEMENT ACTIVITIES FOR NUCLEAR PRESSURE RELIEF DEVICES

(2) (NVR Form Registration No.)

(3) (R/R Plan No., Job No., etc.)

CATEGORY OF ACTIVITY: 1 ☐ 2 ☐ 3 ☐

☐ REPAIR/REPLACEMENT ☐ RE-RATING

1. WORK PERFORMED BY: (1) (name of "NVR" authorized organization)
   (address)
2. WORK PERFORMED FOR: (4) (name)
   (address)
3. OWNER: (5) (name)
   (address)
4. NAME, ADDRESS, AND IDENTIFICATION OF NUCLEAR FACILITY: (6) (name)
   (address)/ (unit identification)
5. CODE APPLICABLE FOR INSERVICE INSPECTION: (7) (edition) (addenda) (code case(s))
6. CODE USED FOR REPAIR/REPLACEMENT ACTIVITY: (8) (edition) (addenda) (code case(s))
7. NBIC USED FOR REPAIR/REPLACEMENT ACTIVITY: (9) (edition)
8. DESIGN RESPONSIBILITY: (10)
9. **REPAIRED PRESSURE RELIEF DEVICE: SEE PAGE 2**
10. OPENING PRESSURE: (11) BLOWDOWN (if applicable): (12)
11. SET PRESSURE AND BLOWDOWN ADJUSTMENT MADE AT: (13) USING: (14)
12. DESCRIPTION OF WORK: (include name and identifying number of replacement parts):
    (15)

12. REMARKS: (16)

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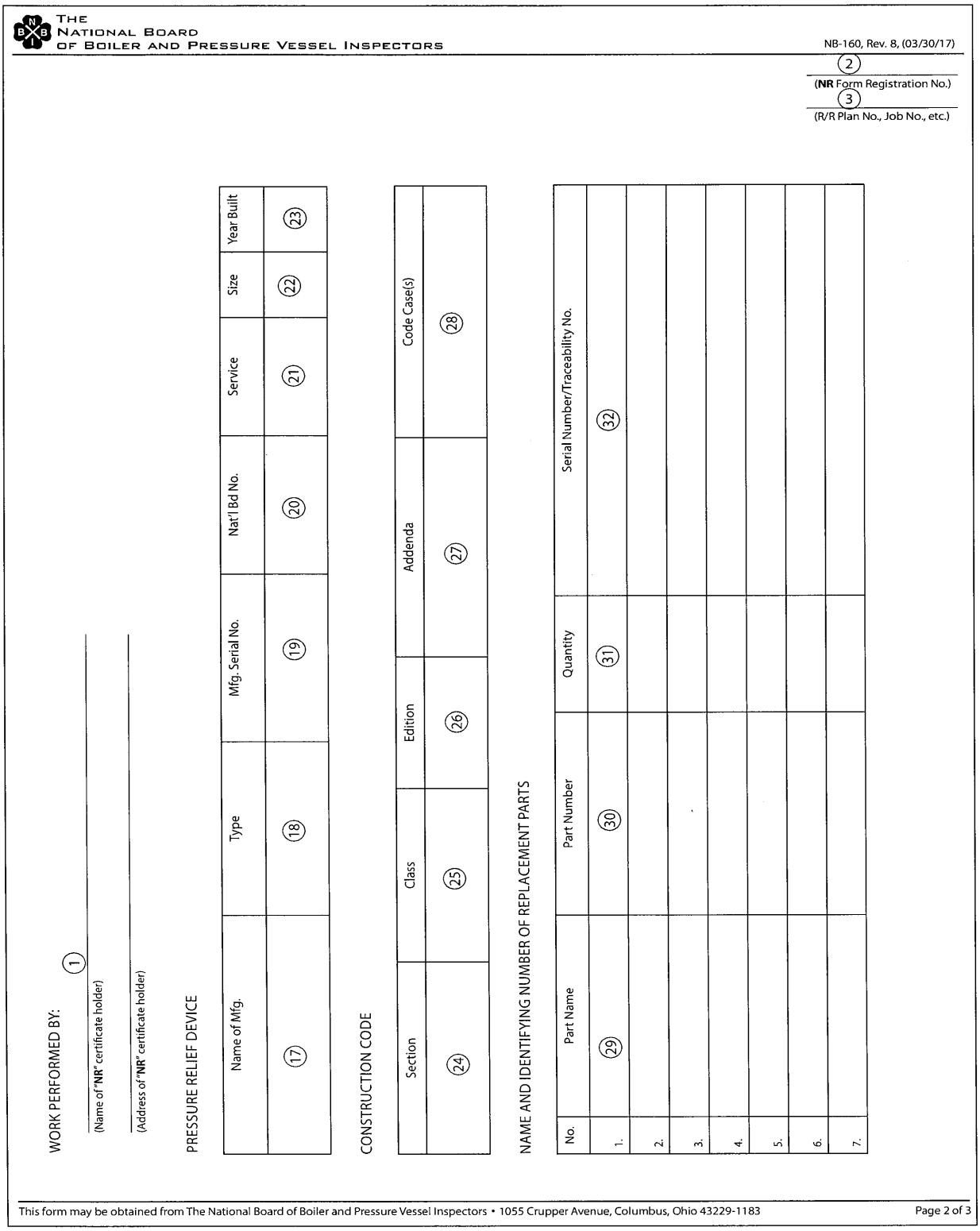
FIGURE S9.7.2
FORM NVR-1, PAGE 2 OF 3



THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

NB-160, Rev. 8, (03/30/17)

(2) (NR Form Registration No.)

(3) (R/R Plan No., Job No., etc.)

WORK PERFORMED BY: (1)

(Name of "NR" certificate holder)

(Address of "NR" certificate holder)

PRESSURE RELIEF DEVICE

Name of Mfg.	Type	Mfg. Serial No.	Nat'l Bd No.	Service	Size	Year Built
(17)	(18)	(19)	(20)	(21)	(22)	(23)

CONSTRUCTION CODE

Section	Class	Edition	Addenda	Code Case(s)
(24)	(25)	(26)	(27)	(28)

NAME AND IDENTIFYING NUMBER OF REPLACEMENT PARTS

No.	Part Name	Part Number	Quantity	Serial Number/Traceability No.
1.	(29)	(30)	(31)	(32)
2.				
3.				
4.				
5.				
6.				
7.				

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FIGURE S9.7.3
FORM NVR-1, PAGE 3 OF 3

THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

NB-160, Rev. 8, (03/30/17)

_____ (form "**NVR**" registration no.)

_____ (R/R Plan No., Job No., etc.)

CERTIFICATE OF COMPLIANCE

I, (33) _____, certify that to the best of my knowledge and belief the statements made in this report are correct and the repair/replacement of the pressure relief devices described above conform to (34) _____ and the *National Board Inspection Code* "**VR**" & "**NR**" rules.

National Board *Certificate of Authorization* No. (35) _____ to use the "**VR**" stamp expires (36) _____
National Board *Certificate of Authorization* No. (37) _____ to use the "**NR**" stamp expires (38) _____
Date (39) _____ Signed (40) _____ (41) _____
(authorized representative) (title)

CERTIFICATE OF INSPECTION

I, (42) _____, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and certificate of competency, where required, issued by the Jurisdiction of (43) _____ and employed by (44) _____ of (45) _____ have inspected the repair/replacement described in this report on (46) _____ and state that to the best of my knowledge and belief, this repair/replacement has been completed in accordance with the Code specified and the *National Board Inspection Code* "**VR**" & "**NR**" rules.

By signing this certificate, neither the undersigned nor my employer makes any warranty, expressed or implied, concerning the repair/replacement described in this report. Furthermore, neither the undersigned nor my employer shall be liable in any manner for any personal injury, property damage, or loss of any kind arising from or connected with this inspection.

Signed (47) 46 Date (48) 47 (49) 48
(inspector) (National Board and endorsement)

This form may be obtained from The National Board of Boiler and Pressure Vessel Inspectors • 1055 Crupper Avenue, Columbus, Ohio 43229-1183 Page 3 of 3

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TABLE S9.7

GUIDE FOR COMPLETING FORM NVR-1, REPORT OF REPAIR/REPLACEMENT ACTIVITIES FOR NUCLEAR PRESSURE RELIEF DEVICES, NB-160

Reference to Circled Numbers in the Form	Description
	Title Block: Check type of activity, repair/replacement and/or rerating, as applicable.
	Check category of activity, 1, 2, or 3, as described in Part 3, Paragraph 1.6.2.
(1)	Name and address of the organization, as shown on the National Board "VR" and "NR" Certificates of Authorization, which performed the activity.
(2)	Indicate NVR Form Registration Number.
(3)	Indicate the repair/replacement plan number, job number, etc., as applicable for traceability, assigned by the organization that performed the work.
(4)	Name and address of the organization for which the work was performed.
(5)	Name and address of the owner nuclear facility.
(6)	Name and address of the nuclear facility and, if applicable, identification of the unit.
(7)	Identify the edition, addenda, and as applicable, code cases of the code used for the inservice inspection activity.
(8)	Identify the edition, addenda, and as applicable, code cases of the code used for the repair/replacement activity.
(9)	Identify the NBIC edition used for the repair/replacement activity.
(10)	Identify the organization responsible for design or design reconciliation, if applicable.
(11)	Indicate the set pressure of the valve.
(12)	Indicate the blowdown, if applicable, as a percentage of set pressure.
(13)	Indicate the location of testing.
(14)	Indicate medium (steam, air, etc.) used for the adjustment of the set pressure and, if applicable, blowdown.
(15)	Provide a detailed summary describing the scope of work completed. Information to be considered should include type of work (welding, brazing, fusing), location, steps taken for removal or acceptance of defects, examinations, testing, heat treat, and other special processes or methods utilized. If Necessary, attach additional data, sketch, drawing, Form R-4, etc. If additional data is attached, so state in the remarks section.
(16)	Indicate any additional information pertaining to the work, such as, additional documentation that is attached to this form to further support item 15.
(17)	Manufacturer's name of the affected item.

TABLE S9.7 CONT'D

Reference to Circled Numbers in the Form	Description
(18)	Describe the type of pressure relief device (e.g., safety valve, safety relief valve, pressure relief valve).
(19)	Manufacturer's serial number of the affected item.
(20)	National Board number, if applicable, of the affected item.
(21)	Indicate the service as steam, liquid, air/gas, etc.
(22)	Indicate the pressure relief device by inlet size, in inches.
(23)	Indicate the year the affected item was manufactured.
(24)	Indicate the name, section and division of the original construction code for the affected item.
(25)	Indicate the code class for the affected item as applicable, i.e. Class 1, 2 or 3.
(26)	Indicate the construction code edition for the affected item.
(27)	Indicate the construction code addenda, as applicable, for the affected item.
(28)	Indicate any applicable code cases used for manufacturing of the affected item.
(29)	Name of the replacement part.
(30)	Identifying number of the replacement part.
(31)	Number/quantity of each replacement part used.
(32)	Indicate the Serial number or other traceability used by the manufacturer of the replacement part.
(33)	Type or print name of authorized representative from the certificate holder.
(34)	Indicate code as applicable to the repair/replacement activity performed.
(35)	Indicate National Board Certificate of Authorization number, if applicable for the "VR" Stamp.
(36)	Indicate month, day, and year the certificate expires, if applicable for the "VR" Stamp.
(37)	Indicate National Board Certificate of Authorization number, if applicable for the "NR" Stamp.
(38)	Indicate month, day, and year the certificate expires, if applicable for the "NR" Stamp.
(39)	Signature of authorized representative from the certificate holder defined in item 27 above.

TABLE S9.7 CONT'D

Reference to Circled Numbers in the Form	Description
(40)	Indicate month, day, and year of signature by the authorized representative.
(41)	Title of authorized representative as defined in the Quality Program.
(42)	Type or print name of Authorized Nuclear Inspector.
(43)	Indicate the Jurisdiction where the activity is performed, when required.
(44)	Indicate Authorized Nuclear Inspector's employer.
(45)	Indicate address of Authorized Nuclear Inspector's employer (city and state or province).
~~(46)~~	~~Indicate month, day, and year of inspection by the Authorized Nuclear Inspector.~~
~~(47)~~ 46	Signature of Authorized Nuclear Inspector defined in item 42 above.
~~(48)~~ 47	Indicate month, day, and year of signature by the Authorized Nuclear Inspector.
~~(49)~~ 48	National Board Commission number and required endorsements.

ITEM 21-XX: Update Table 2.3

2.3 STANDARD WELDING PROCEDURE SPECIFICATIONS (SWPSs)

a) One or more SWPSs from NBIC Part 3, Table 2.3 may be used as an alternative to one or more WPS documents qualified by the organization making the repair or alteration, provided the organization accepts by certification (contained therein) full responsibility for the application of the SWPS in conformance with the Application as stated in the SWPS. When using SWPSs, all variables listed on the Standard Welding Procedure are considered essential and, therefore, the repair organization cannot deviate, modify, amend, or revise any SWPS. US Customary Units or metric units may be used for all SWPSs in NBIC Part 3, Table 2.3, but one system shall be used for application of the entire SWPS in accordance with the metric conversions contained in the SWPS. The user may issue supplementary instructions as allowed by the SWPS. Standard Welding Procedures Specifications shall not be used in the same product joint together with the other Standard Welding Procedure Specifications or other welding procedure specifications qualified by the organization. SWPSs may be purchased at the AWS Bookstore at http://pubs.aws.org.

b) The AWS reaffirms, amends or revises SWPSs in accordance with ANSI procedures.

c) The use of previous versions of the listed SWPSs is permitted. Previous versions include Amended, Reaffirmed Revised or Superseded SWPSs regardless of the publication date.

TABLE 2.3

SWPS DESIGNATION: YEAR

B2.1-1-001: 2020	B2.1-1-201: 2019	B2.1-8-215: 2012	B2.1-1/8-229: 2013
B2.1-1-002: 2020	B2.1-1-202: 2019	B2.1-8-216: 2012	B2.1-1/8-230: 2013
B2.1-1-016: 2018	B2.1-1-203: 2019	B2.1-4-217: 2021	B2.1-1/8-231: 2015
B2.1-1-017: 2018	B2.1-1-204: 2019	B2.1-4-218: 2021	B2.1-1-232: 2020
B2.1-1-018: 2021	B2.1-1-205: 2019	B2.1-4-219: 2021	B2.1-1-233: 2020
B2.1-1-019: 2018	B2.1-1-206: 2019	B2.1-4-220: 2021	B2.1-1-234: 2021
B2.1-1-020: 2018	B2.1-1-207: 2019	B2.1-4-221: 2021	B2.1-1-235: 2021
B2.1-1-021: 2018	B2.1-1-208: 2019	B2.1-5A-222: 2021	
B2.1-1-022: 2018	B2.1-1-209: 2019	B2.1-5A-223: 2021	
B2.1-8-023: 2018	B2.1-1-210: 2012	B2.1-5A-224: 2021	
B2.1-8-024: 2012	B2.1-1-211: 2012	B2.1-5A-225: 2021	
B2.1-8-025: 2012	B2.1-8-212: 2012	B2.1-5A-226: 2021	
B2.1-1-026: 2018	B2.1-8-213: 2012	B2.1-1/8-227: 2013	
B2.1-1-027: 2018	B2.1-8-214: 2012	B2.1-1/8-228: 2013	

STATUS:
2022 14 SWPSs: All have been updated and are presently being balloted in committee
2021 13 SWPSs: Approved and at the Printers targeting a December 2021 release
2020 4 SWPSs Done
2019 9 SWPSs Done
2018 9 SWPSs Done

TOTAL: 49 SWPSs

Terry,
This table represents where we are and where we are going with Table 2.3. I will prepare a ballot in the Fall to correct a typo and delete the word table and submit (hopefully) 13 SWPSs for NBIC adoption.
Jim Sekely

11/14/21

PROPOSED REVISION OR ADDITION

Item No.

A 21-71

Subject/Title

Remove the mechanical portion of tube plugging from 3.3.4.9. Only address i

NBIC Location

Part: Repairs and Alterations; Section: 3; Paragraph: 3.4.9

Project Manager and Task Group

Source (Name/Email)

Kathy Moore / kathymoore@joemoorecompany.com

Statement of Need

Removing the mechanical portion of the text. Many Jurisdictions are having a difficult time enforcing that part of the NBIC

Background Information

Mr, Kinney wrote on the Chief's Forum and asked the Chiefs what they thought of 3.3.4.9. They wanted the mechanical portion dropped.

Existing Text

3.3.4.9 TUBE PLUGGING IN FIRETUBE BOILERS When the replacement of a tube in a firetube boiler is not practicable at the time the defective tube is detected, with the concurrence of the owner, Inspector, and when required, the Jurisdiction, the tube may be plugged using the following course of repair: a) The scope of work, type of plug and method of retention; whether welded or mechanical interface, shall be evaluated by the “R” Certificate Holder performing the repair and reviewed with the Inspector, and when required, the Jurisdiction. b) When the method of plugging is by welding, strength calculations for the size of the weld shall be in accordance with the original code of construction. The “R” Certificate Holder performing this repair shall weld the plug to the tube, or to the tube sheet, or a combination of both. c) Plugging a tube in a firetube boiler is recognized as an alternative to the replacement of a firetube and may be further limited as a method of repair by the number of tubes plugged and their location; scattered or clustered. The operational effects on the waterside pressure boundary or membrane and the effects on the combustion process throughout the boiler should be considered prior to plugging. d) The boiler may be returned to service for a period of time agreed upon by the owner, the Inspector, and when required, the Jurisdiction. e) The Form R-1 shall be completed for the plugging of firetubes, identifying the means of plug retention; mechanical or by welding.

Proposed Text

Where it is not practicable to mechanically plug a tube in a firetube boiler, the plug may be secured to the tube and/or tubesheet by welding with the concurrence of the owner, the Inspector, and the Jurisdiction where the pressure-retaining item is installed, where required. The following course of repair shall be followed: a) The scope of work, type of plug and method of retention, shall be evaluated by the “R” Certificate Holder performing. b) Strength calculations for the size of the weld shall be performed in accordance with the original code of construction. c) The operational effects on the waterside pressure boundary or membrane and the effects on the combustion process throughout the boiler should be considered prior to plugging as this may limit the quantity of tubes plugged. d) The boiler may be returned to service for a period of time agreed upon by the owner, the Inspector, and the Jurisdiction where the pressure-retaining item is installed, where required. e) The Form R-1 shall be completed for the welded plugging of
firetubes.

	VOTE:						
COMMITTEE	Approved	Disapproved	Abstained	Not Voting	Passed	Failed	Date

PROPOSED REVISION OR ADDITION

Item No.

A 21-77

Subject/Title

Repairs/Alterations of Impact Tested Vessels

NBIC Location

Part: Repairs and Alterations; Section: 3; Paragraph: 3.3.6

Project Manager and Task Group

Source (Name/Email)

Robert Underwood / robert_underwood@hsb.com

Statement of Need

There is an urgent need to address these concerns as the repair firms cannot comply with the existing wording in 3.3.6. The plan is to incorporate this item into the 2023 Edition of Part 3 and propose a corresponding Intent Interpretation that would provided guidance to NBIC users as soon as possible.

Background Information

Existing paragraph 3.3.6 contains some requirements that the repair firm cannot comply with such as determining the heat treated condition and the notch toughness characteristics of the material to be repaired. It also contains references to dead links in the NBIC that provide no guidance to the repair firm. This proposal would eliminate the requirements of knowing the heat treated condition and the notch toughness characteristics of the material to be repaired and simply refer back to the original construction code in regards to WPS qualification. The proposal also would move the location of these requirements from paragraph 3.3.6 (which addresses repair only) to 3.2.8 which addresses repairs and alterations.

Existing Text

3.3.6 PRESSURE VESSEL IMPACT TESTING a) Welding procedures used for repairs shall be qualified with impact testing when required by the original code of construction. The requirements for impact testing shall be in accordance with the rules of the original code of construction except that vessel (production) impact testing is not required. b) The test material for the welding procedure qualification with impact testing shall be of the same P-number and Group number, and heat-treated condition as the material being repaired. 1) In the event that the notch toughness of the material to be repaired is unknown, evidence from tests of that material or from another acceptable source (see NBIC Part 3, 2.5.3) may be used for the base metal notch toughness when qualifying the WPS as required in NBIC Part 3, 2.5.3.2 h). 2) In the event that the original material specification is obsolete, the material used for the test coupon should conform as closely as possible to the original material used for construction based on nominal composition and carbon equivalent (IIW Formula CE = C + Mn/6 + (Cr + Mo + V)/5 + (Ni + Cu)/15; elements are expressed in Weight Percent Amounts), and heat-treated condition, but in no case shall the material be lower in strength.

Proposed Text

3.2.8 PRESSURE VESSEL IMPACT TESTING a) Welding procedures used for repairs shall be qualified with impact testing when required by the original code of construction. The requirements for impact testing shall be in accordance with the rules of the original code of construction except that vessel (production) impact testing is not required. b) The test material for the welding procedure qualification with impact testing shall be of the same P-number and Group number as the material being repaired.,

	VOTE:						
COMMITTEE	Approved	Disapproved	Abstained	Not Voting	Passed	Failed	Date

PROPOSED REVISION OR ADDITION

Item No.

A 21-82

Subject/Title

Examples of Repairs

NBIC Location

Part: Repairs and Alterations; Section: 3; Paragraph: 3.3.3(s)

Project Manager and Task Group

Robert Underwood, Subcommittee Repairs/Alterations

Source (Name/Email)

Robert Underwood / robert_underwood@hsb.com

Statement of Need

Adding "repair" to 3.3.3(s) would then address use of different weld material. Currently 3.3.3(s) only addresses replacement of the part, not repair (Repair is addressed in 3.3.3(r)).

Background Information

We have had some recent questions from repair firms about using different weld metal when performing repairs of pressure retaining items. The NBIC does not directly address use of weld metal that is different than the original design. Paragraph 3.3.3(r) addresses "repair" or replacement of pressure parts which I think covers the weld metal, but 3.3.3(s) only addresses "replacement" of the pressure part. This proposal would simply add "repair" to 3.3.3(s) which would address use of weld metal of a different composition.

Existing Text	**Proposed Text**
Replacement of a pressure-retaining part with a material of different nominal composition and, equal to or greater in allowable stress from that used in the original design, provided the replacement material satisfies the material and design requirements of the original code of construction under which the vessel was built. The minimum required thickness shall be at least equal to the thickness stated on the original Manufacturer's Data Report;	The repair or replacement of a pressure-retaining part with a material of different nominal composition and, equal to or greater in allowable stress from that used in the original design, provided the replacement material satisfies the material and design requirements of the original code of construction under which the vessel was built. The minimum required thickness shall be at least equal to the thickness stated on the original Manufacturer's Data Report;

	VOTE:						
COMMITTEE	Approved	Disapproved	Abstained	Not Voting	Passed	Failed	Date