THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

NATIONAL BOARD SUBCOMMITTEE REPAIRS AND ALTERATIONS

MINUTES

Meeting of January 13th, 2021
San Antonio, TX

These minutes are subject to approval and are for the committee use only. They are not to be duplicated or quoted for other than committee use.

The National Board of Boiler & Pressure Vessel Inspectors
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1. **Call to Order**
   Chairman Troutt called the meeting to order at 8:00 AM

2. **Introduction of Members and Visitors**
   Introductions took place amongst all members and visitors, and an attendance was taken by the Secretary. (**Attachment 1**).

3. **Check for a Quorum**
   Based on the members present, a quorum was reached.

   51% of Members needed for Quorum = 10 of the 19 Members needed
   2/3 of majority of those Members present needed for Approval of Items

4. **Awards/Special Recognition**
   Chairman Troutt presented Mr. Marty Toth a 5 Year Pin in appreciation for his service to the NBIC Code Committee.

5. **Announcements**
   Secretary Hellman announced the National Board will be hosting a reception for all committee members and visitors on Wednesday evening at 5:30pm.

6. **Adoption of the Agenda**
   a. The Agenda was revised with the addition of new Items and status updates from previous meetings. The Agenda Revisions and Additions are listed below:
      i. Revised Item 20-3 (Update – Item 20-10 approved at July 2020 mtg)
      ii. Revised Item 20-81 (Update – Combined with Item 20-89 – Close w/No Action)
      iii. Revised Item 20-89 (Update – Revised to include Item 20-81)
      iv. Revised Item 19-60 (incorporated Item 20-68)
      v. Revised Item 20-16 (update – Intent to Close w/No Action)
      vi. Revised Item 20-68 (update – Intent to Close w/No Action)
      vii. Revised Item 20-92 (update – May be added to 19-60 and Close w/No Action)
      viii. Added 20-93 notes from Historical – Item was Closed w/No Action
      ix. Added Item 21-10
      x. Added Item 21-11
      xi. Added Item 21-12
      xii. Membership and Officer appointments have been updated.
   b. A motion was made and seconded to adopt the Agenda as revised and was Unanimously Approved.

7. **Approval of the Minutes of the July 15th, 2020 Meeting**
   There was a motion to approve the Minutes of July 15th, 2020 as published. The motion was seconded and approved.

8. **Review of Rosters**
   a. Membership Nominations
      i. Mr. Don Kinney (Jurisdictional Authorities) has expressed interest in becoming a member of Subgroup (SG) and Subcommittee (SC) R&A, as well as the Historical Boilers and Interpretations Task Groups (TGs). Mr. Kinney was unanimously approved by the SC for membership on the referenced TGs, SGs, and SCs and will be placed on the Main Committee Agenda.

ii. Mr. David Domitrovich (Users) has expressed interest in becoming a member of Task Group Locomotive, and was approved to become a member by the task group at their August 2020 meeting. Mr. Domitrovich was unanimously approved by the SC for membership to the referenced TG and will be placed on the Main Committee Agenda.

iii. Mr. Kevin Anderson has expressed interest in becoming a member of Historical.TG. Mr. Anderson was unanimously approved by the SC for membership on the TG and will be placed on the Main Committee Agenda.

b. Membership Reappointments

i. The following Subgroup R&A memberships are set to expire prior to the July 2021 NBIC meeting: Mr. Frank Johnson, Ms. Kathy Moore, Mr. Brian Morelock, and Mr. Tom White.

ii. The following Historical Boilers Task Group memberships are set to expire prior to the January 2021 NBIC meeting: Mr. Jim Getter, Dennis Rupert, Mr. Rob Troutt, Mr. Matt Sansone, and Mr. Mike Wahl.

All members were reappointed by the SC unanimously and will be placed on the Main Committee Agenda

c. Officer Nominations

i. Mr. Trevor Seime was unanimously approved as the Interpretation TG Vice Chair by the SC.

9. Interpretations

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

General Description: Inspector involvement in Fitness-for-Service Assessments

Subgroup: Repairs and Alterations

Task Group: J. Siefert (PM)

Explanation of Need:
The below questions are intended to gain clarity as to first which Inspector (i.e. "IS" Commissioned or "R" Endorsement) signs the FFSA Form NB-403 when an "R" Certificate Holder is involved with a repair in that region as well as determine what level of review of the Fitness-for-Service the Inspector is expected to complete. If it is an Inspector holding a "R" Endorsement with an AI Commission (not tested on NBIC Part 2), shouldn't the relevant pages in NBIC Part 2 concerning Fitness for Service be included in their tested body of knowledge, so they are aware of the detailed rules?

The Body-Of-Knowledge for National Board Inspectors holding either an "IS" Commission or "R" Endorsement does not reference ASME FFS-1/API 579 Fitness-For-Service Standard or have any expectation that the Inspector be capable of determining if the correct Fitness for Service methodology was used or that the assumptions taken by the Engineer in the analysis were the most appropriate or accurate. Clarification is also requested due to the Form NB-403 signature block stating "Verified by" for the Inspector without any other disclaimers as typically found on other Forms signed by Inspectors such as ASME MDRs and NBIC Form R-1/R-2.

July 2020 Meeting Action: J. Siefert presented that Action Item 20-10 may address this inquire and submitted a **Progress Report** to await the outcome of Item 20-10.

SC ACTION: J. Siefert presented that Item 20-10 was approved at July 2020 NBIC Meeting and proposed a **response letter to inquirer be sent to see if Item 20-10 addresses their concerns and Close this Item**. The proposal was motioned, seconded, and Unanimously Approved.

Item Number: 20-11	NBIC Location: Part 3, 3.3.3	Attachment 2

General Description: Scope of Repairs

Subgroup: Repairs and Alterations

Task Group: K. Moore (PM)

Explanation of Need:
NBIC Part 3 lists several examples of repair but nowhere limits the scope or amount of these examples that can be utilized when performing repairs. This creates some uncertainty when performing some types of repairs, such as replacing the tubesheets of a fixed tubesheet type heat exchanger as listed in 3.3.3 e). According to ASME BPV Code Section VIII Division 1 Part UHX, Section 13, the length of the tubes is a design parameter and therefore replacing the tubesheet in accordance with its original design might require the replacement of the tubes as well to maintain the original design length.

July 2020 Meeting Action: K. Moore presented. Discussion took place on if tubsheet replacement activities may qualify as a Repair or Alteration. Interpretation 17-11 was referenced, and P. Becker indicated that she would be opening a new Action Item to revise the definition of an alteration in 3.4.4 d) for clarification. It was decided that the proposal needs additional work at the TG Interpretation level, and the proposal can be submitted to SC R&A via Letter Ballot once ready. This was a **Progress Report**.

SC ACTION: K Moore presented the proposal. The proposal was motioned, seconded and **Unanimously Approved.**

New Interpretation Requests:

Item Number: 20-66	NBIC Location: Part 3, 3.3.2 e)	Attachment 3

General Description: Possible contradictory interpretations of Part 3, 3.3.2 e) 2)

Subgroup: Repairs and Alterations

Task Group: R. Underwood (PM)

Explanation of Need:
Two previously issued interpretations, 95-14 and 95-21, seem to be contradictory with the NBIC itself. The reason for the interpretation request is that two previously published NBIC Interpretations and the NBIC itself seem to be contradictory. Interpretations 95-14 and 95-21 lead the reader to conclude that if the original vessel was postweld heat treated, then the addition of refractory clips by welding, regardless of size, without postweld heat treatment is an alteration. However, NBIC Part 3 [2019 Edition], 3.3.3 b)1) and 2) list addition of welded attachments to pressure parts, such as: Studs for insulation or refractory lining and hex steel or expanded metal for refractory lining as "Examples of Repairs". Furthermore, NBIC Part 3 [2019 Edition], 3.3.2 e) 2) states: "The following repairs may be considered as routine repairs and shall be limited to these categories:

2) The addition or repair of nonload bearing attachments to pressure-retaining items where postweld heat treatment is not required;

INT TG Action: Proposal was revised and Unanimously Approved
SC ACTION: Mr. Underwood presented and the proposal was motioned, seconded and Approved w/ 1 abstention (P. Edwards)

Item Number: 20-77	NBIC Location: Part 3, 1.3.2	Attachment 4

General Description: Authorization of repair/alteration activities

Subgroup: Repairs and Alterations

Task Group: D. Kinney

Explanation of Need:
Many R-certificate holders also have U or S stamps and as such have a regular AI (with R endorsement) to whom they tend to have review repair and alteration packages. However, when the physical work will be conducted 'out of state' travel limitations and or jurisdictional authorization requirement prevent the local AI from making the final acceptance inspection thus another AI must do that work, para 1.3.2 a) makes clear that both Inspectors have to be employed by the same agency. Form R-2 has 2 Inspector sign off locations but does not make clear if the two Inspectors must be from the same AIA or not.

INT TG Action: Proposal was Unanimously Approved
SC ACTION: Mr. Kinney presented a proposal that was motioned, seconded and **Unanimously Approved.**

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**.

Item Number: 20-81 **NBIC Location: Part 3, 4.4.2 a) 1)** **No Attachment**

General Description: Minimum Required Test Pressure for Alteration Activities

Subgroup: Repairs and Alterations

Task Group: R. Underwood (PM)

Explanation of Need:
To provide clarity that the minimum test pressure for alterations shall be in accordance with the original code of construction.

UPDATE: Item 20-81 and 20-89 ask very similar questions. The "Question" from this Interpretation Request (20-81) was used as the "Committee's Question 1" for INT 20-89 with the intent to close this item (20-81) with no action.

INT TG Action: Closed w/No Action

SC ACTION: Mr. Underwood presented this Item has been answered by Int Item 20-89 and motioned to **Close w/No Action**. The motion was seconded and Unanimously Approved.

Item Number: 20-89 **NBIC Location: Part 3, 4.4.2** **Attachment 5**

General Description: LIQUID PRESSURE TEST EXAMINATION METHODS APPLICABLE TO ALTERATIONS

Subgroup: Repairs and Alterations

Task Group: R. Troutt, K. Moore

Explanation of Need:
For Alteration can Minimum Test Pressure Shall be Design Pressure or MAWP considering same Condition as Clause 4.4.1 of Pressure Test for Repairs.

UPDATE: The question from INT 20-81 was used as the "Committee's Question 1" on this Interpretation Request. INT 20-81 is to be closed with no action.

INT TG Action: The proposal was revised and Approved with one Abstention (P. Becker)

SC ACTION: Mr. Troutt presented. After discussion, the proposal was revisited after considering related Action Item 20-80. This led to the proposal being revised due to Action Item 20-80 proposal being approved. The revised proposal was motioned, seconded and was **Unanimously Approved**.

Item Number: 20-90	**NBIC Location: Part 3, 1.4.1**	**Attachment 6**

General Description: 1.4.1 ACCREDITATION PROCESS / NB-415- Certification of Scope

Subgroup: Repairs and Alterations

Task Group: K Moore, R. Troutt

Explanation of Need:
The NBIC Certification scope Does not Restrict the Repair Organization to Perform Based on their ASME Certification of scope, as long as Manual Controls are addressed for the Design and Repair/ Fabrication Scope they can perform Repair and Alteration.

INT TG Action: Proposal was Unanimously Approved

SC ACTION: Ms. Moore presented a proposal that was revised after discussion. The revised proposal was motioned, seconded, and was **Unanimously Approved**.

Item Number: 20-91	**NBIC Location: Part 3, 1.5.1 h)**	**Attachment 7**

General Description: Mechanical Repair Procedures

Subgroup: Repairs and Alterations

Task Group: R. Underwood (PM)

Explanation of Need:
Part 3, paragraph 1.5.1(h) requires that control of mechanical assembly/repair procedures be addressed in the R Certificate Holder's Quality Manual. Over the last year or so, there have been National Board Team Leaders requesting these procedures (during joint reviews) for work such as rolling tubes in a boiler and replacing a bolted fitting on a pressure retaining item. This has resulted in questions from certificate holders and Inspectors about why an "R" certificate holder is required to have procedures for mechanical work that doesn't even require an "R" Stamp.

INT TG Action: Proposal was Unanimously Approved

SC ACTION: Mr. Underwood presented a porosal that was revised after discussion. The proposal was motioned, seconded and was **Approved** w/ 1 Abstention (P. Shanks)

10. Action Items

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.

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.**

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.

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.

Item Number: 18-100	NBIC Location: Part 3, 3.3.2	No Attachment

General Description: Revision adding heat exchanger tubes with an outside diameter of ¾" or smaller to NBIC Part 3.3.2 Routine Repairs

Subgroup: Repairs and Alterations

Task Group: M. Toth – PM, B. Schaefer, T. McBee, M. Winters, R. Underwood

July 2020 Meeting Action: Mr. M. Toth presented a **Progress Report**.

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

Item Number: 19-16	NBIC Location: Part 3, 3.3.2 e)	Attachment 8

General Description: Reword to provide clarity; contradictory requirement Part 3; 3.2.2 e)

Subgroup: Repairs and Alterations

Task Group: T. White

Explanation of Need: This wording of this clause is causing confusion. The original submitter has had multiple instances where owners have requested to purchase welded replacement parts directly and read this clause with the belief that they can purchase a replacement part for in some cases a welded pressure part for an ASME Section I boiler and safe money by having the fabricator not Hydro test as per Section I even when it was not impractical to have the testing performed.

July 2020 Meeting Action: T. White presented a **Progress Report**.

SG R&A Action: The proposal was revised and Unanimously Approved.
SC ACTION: Mr. White presented a proposal that was motioned, seconded and was **Unanimously Approved.**

Item Number: 19-60	NBIC Location: Part 3, 1.5.1	Attachment 9

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**.

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.

July 2020 Meeting Action: P. Shanks presented a proposal. The proposal was revised after discussion to add select verbiage from PCC-2 into the NBIC instead of referencing PCC-2. A motion to send the revised proposal to the **SG and SC R&A via Letter Ballot** was made, seconded, and **Unanimously Approved.**

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

Item Number: 19-68	NBIC Location: Part 3, 1.6	Attachment 10

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

Subgroup: Repairs and Alterations

Task Group: B. Wielgoszinski (PM)

Explanation of Need: Review of 1.6 for possible requirement for ANI's and ANII's to hold the (R) Endorsement for "NR" activities.

July 2020 Meeting Action: B. Wielgoszinski presented a **Progress Report**. Mr. R. Spuhl and Mr. T. Roberts volunteered to help work on this item and were added to the Task Group.

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

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.

July 2020 Meeting Action: No members of the Graphite Task Group were present to present the item.

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.

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.

July 2020 Meeting Action: No members of the Graphite Task Group were present to present the item.

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.

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.

Item Number: 19-82	**NBIC Location: Part 3, 1.5.1 j)**	**No Attachment**

General Description: Review verbiage in Part 3, 5.12.5.1 8) and 5.12.5.1.11)

Subgroup: Repairs and Alterations

Task Group: M. Quisenberry (PM)

Explanation of Need: Safety is not addressed in Part 3. This verbiage could be added to the 1.5.1 j) Method of Performing Work paragraph so Certificate Holders can address the safety concerns specific to their scope of activities.

July 2020 Meeting Action: Mr. M. Quisenberry presented this as a **ProgressReport**.

SG R&A Action: Verbiage addressing safety to be added to Forward by NB Staff. This Item was Closed w/No Action
SC ACTION: K. Moore presented that this verbiage will be added to "Forward" of the NIBC and motioned to **Close w/No Action**. The motion was Unanimously Approved.

Item Number: 20-8	**NBIC Location: Part 3, 8.1 b)**	**No Attachment**

General Description: Interpretation revision process

Subgroup: Repairs and Alterations

Task Group: K. Moore (PM)

Explanation of Need: K. Moore presented that this Item can be closed if the NBIC Introduction is revised to address the use of Interpretations as proposed in this Action Item. This will be considered a **Progress Report** until the revised Introduction can be reviewed and this Action Item can be closed.

SG R&A Action: The verbiage addressing the use of Interps as proposed will be added to the Introduction by NB Staff. This Item was Closed w/No Action.
SC ACTION: K. Moore presented that this verbiage will be added to "Introduction" of the NIBC and motioned to **Close w/No Action**. The motion was Unanimously Approved.

Item Number: 20-15	NBIC Location: Part 3, 3.3.2 & 5.7.2	No Attachment

General Description: Stamping requirements for routine repairs

Subgroup: Repairs and Alterations

Task Group: R. Troutt (PM), K. Moore

Explanation of Need: This would offer traceability to the R-Stamp holder responsible for the work.

Meeting Action: R. Troutt presented a proposal. A motion was made, seconded, and **Unanimously Approved to send the proposal to SG and SC R&A via concurrent Letter Ballots**

SG R&A Action: Progress Report

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

Item Number: 20-16	NBIC Location: Part 3, 3.4.4	No Attachment

General Description: Rules to address re-cold stretching of vessels built to Appendix 44 rules

Subgroup: Repairs and Alterations

Task Group: T. McBee (PM), P. Shanks

Explanation of Need: ASME Section VIII Div.1 Mandatory Appendix 44 paragraph 44-6.2(g) clearly sets out that a vessel built to those rules needs to be re-stretch having had repair welding. it is not clear if ASME are referring to in process (at the original manufactures location) repairs or post construction repairs. However as the NBIC is currently silent this potential issue should be addressed.

Meeting Action: P. Shanks presented a proposal. The proposal was revised after discussion and a decision was made that the proposal needed more work and the PM should ask the submitter of the revision request to attend the next meeting to provide more information on this. This was considered a **Progress Report.**

UPDATE: The submitter (P. Shanks) has proposed that this can be closed with no action.
SG R&A Action: Closed w/No Action

SC ACTION: Mr. McBee presented the submitter (P. Shanks) has proposed this Item can be **Closed w/No Action.** A motion to Close was motioned, seconded, and Unanimously Approved.

Item Number: 20-20	NBIC Location: Part 3, 3.2.2 e)	No Attachment

General Description: Revision to Part 3, 3.2.2 e)

Subgroup: Repairs and Alterations -

Task Group: P. Davis (PM), R. Miletti

Explanation of Need: The certificate holder should not have to explain or justify why a part was not pressure tested in the manufacturing stage. PG-106.8 of Section I allows the part to be fabricated and shipped as such therefore no explanation should be required.

SG R&A Action: Progress Report

SC ACTION: P. Davis presented a **Progress Report.**

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.

July 2020 Meeting Action:
This was a **Progress Report.**

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

Item Number: 20-47	NBIC Location: Part 3, 9.1	No Attachment

General Description: Revision of the definition of ANIA in Section 9 of all Parts

Subgroup: Repairs and Alterations

Task Group: R. Spuhl (PM)

Explanation of Need: ANIA can be revised to clarify requirements and activities of AIA's performing NR inspection activities.

Meeting Action: R. Spuhl presented a **Progress Report**.

SG R&A Action: Progress Report

SC ACTION: Mr. Edwards 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.

Meeting Action: B. Wielgoszinski presented a **Progress Report**.
SG R&A Action: Progress Report

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

New Items:

Item Number: 20-51	NBIC Location: Part 3, 9.1	Attachment 11

General Description: Add practicable and its definition to the glossary

Subgroup: Repairs and Alterations

Task Group: B. Boseo (PM)

Explanation of Need: This is not a commonly used term in everyday language.

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

SC ACTION: This item was approved by Parts 1, 2, and 4 and was motioned, seconded, and **Unanimously Approved.**

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.**

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**.

Item Number: 20-54	NBIC Location: Part 3, 3.2.2 e)	Attachment 12

General Description: Review and Update Part 3, 3.4.4 d)

Subgroup: Repairs and Alterations

Task Group: B. Schaefer (PM)

Explanation of Need: A change in dimension and/or contour is currently listed as an example of an alteration in Part 3, 3.4.4 d). A change in dimension may or may not be an alteration in actuality. Current wording does not allow for a change in dimension, even if it is a minor change not affecting the pressure retaining capability of the PRI, without being an alteration. This can be a burden to the industry.

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

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

Item Number: 20-55	NBIC Location: Part 3, 3.3.3 e)	Attachment 13

General Description: Examples of repairs

Subgroup: Repairs and Alterations

Task Group: J. Walker (PM)

Explanation of Need: By having an and between boiler and heat exchanger the tube is required to be simultaneously installed in both a boiler and a heat exchanger. This is valid for a boiler as they are heat exchanger but in the case of a pressure vessel heat exchanger they are not boilers as boil may not be happening. Therefore, this example is not applicable to pressure vessel which I do not believe is the intent.
SG R&A Action: The proposal was revised and Unanimously Approved.

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

Item Number: 20-60	NBIC Location: Part 3, 3.3.4.8	Attachment 14

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**.

Item Number: 20-61	NBIC Location: Part 3, S8	Attachment 15

General Description: Revise Supplement 8

Subgroup: Repairs and Alterations

Task Group: J. Siefert (PM)

Explanation of Need: Supplement 8 has one sentence regarding filler metal size that needs to be deleted and dissimilar metal welding needs to be addressed under this Supplement.

SG R&A Action: The proposal was revised and Unanimously Approved. Additional verbiage addressing Weld Method 6 to be added for consideration at SC R&A

SC ACTION: Mr. Siefert presented a revised proposal incorporating UNS numbers and added changes to Weld Method 6. A motion to send to **Letter Ballot to SC R&A** was made, seconded and Unanimously Approved.

Item Number: 20-63	NBIC Location: Part 3, 4.4.2 d)	No Attachment

General Description: Addition of alternative method in lieu of pressure testing

Subgroup: Repairs and Alterations

Task Group: T. McBee (PM)

Explanation of Need: Another alternative method is required when contamination of the pressure-retaining item by liquids is possible or when pressure testing is not practicable, and when NDE is not fully applicable to ensure the structural integrity of the alteration.

SG R&A Action: Send a letter to inquirer that this is outside the scope of the NBIC and Close.

SC ACTION: Mr. McBee motioned to **send a Response to inquirer that alternatives to pressure testing are already addressed in the NBIC and Close this Item**. The motion was Unanimously Approved.

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.**

Item Number: 20-68	NBIC Location: Part 3, 1.5.1 e) & f)	No Attachment

General Description: Certifications to be addressed for electric or written signature and date

Subgroup: Repairs and Alterations

Task Group: T. Seime (PM)

Explanation of Need: Certifications, either written or electronic, are not addressed in the NBIC.

SG R&A Action: This proposal was added to Item 19-60 and Closed w/No Action

SC ACTION: Mr. Seime presented that this was added to Item 19-60 and motioned to **Close w/No Action**. The motion was Unanimously Approved.

Item Number: 20-69	NBIC Location: Part 3, S1.2.11.5	No Attachment

General Description: Welds Across Riveted Lap Seams

Subgroup: Locomotive

Task Group: M. Ray (PM)

Explanation of Need: Clarify wording regarding weld taper and provide a cleaner figure to better illustrate the repair. Historical Boilers is considering adding the same text to their Section.

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

Item Number: 20-73	**NBIC Location: Part 3, 4.4.2 a) 2)**	**Attachment 16**

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.**

Item Number: 20-74	**NBIC Location: Part 3, 2.2.1**	**No Attachment**

General Description: PQR conditions of validity

Subgroup: Repairs and Alterations

Task Group: P. Shanks (PM)

Explanation of Need: ASME Section IX are planning to issue a new code case under record number 19-2833 which would allow for the normal room temperature tensile test to be replaced with an elevated one due to some material not being capable of passing at room temp. As part of this the WPS may only be used within +- 50°F of the actual test temperature. If this code case is used and a boiler design temperature is changed the validity of the PQR/PWS qualification is in question. This is a similar situation to a PWHT time at temperature- reheat treating an existing PRI may take the PQR/WPS outside of its qualification.
SG R&A Action: Progress Report

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

Item Number: 20-75	NBIC Location: Part 3, 2.5.3.2 d) & h)	Attachment 17

General Description: Charpy Impact Test Temperature for Welding Method 2

Subgroup: Repairs and Alterations

Task Group: S. Chestnut (PM)

Explanation of Need: Current text in 2.5.3.2 h) requires Charpy impact tests be conducted "at the temperature determined in accordance with NBIC Part 3, 2.5.3.2 d)." 2.5.3.2 d) only discusses WPS preheat and interpass temperature. It does not discuss the temperature at which to conduct CVN testing. There is no reference made to the MDMT.

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

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

Item Number: 20-76	NBIC Location: Part 3, 9.1	Attachment 18

General Description: Define "Remote" in the NBIC Glossary

Subgroup: Repairs and Alterations

Task Group: R. Valdez (PM), M. Winters

Explanation of Need: With the use of indirect inspection equipment from borescopes to tethered drones/vehicles for confined space inspections, there is a need to clarify what is considered a "remote" inspection vs an "indirect" inspection.

SG R&A Action: The proposal will be sent to each SC (Parts 1-4) and MC as a Rvw and Comment LB.

SC ACTION: Mr. Valdez motioned for **this proposal to be sent to each SC (Parts 1-4) and MC as a Rvw and Comment LB**. The motion was Unanimously Approved.

Item Number: 20-80	NBIC Location: Part 3, 4.4.2 a) 1)	Attachment 19

General Description: Liquid Pressure Testing of Alterations

Subgroup: Repairs and Alterations

Task Group: R. Underwood (PM)

Explanation of Need: To provide clarity that the minimum test pressure for alterations shall be in accordance with the original code of construction.

SG R&A Action: The proposal was Unanimously Approved.
SC ACTION: Mr. Underwood presented and the proposal was revised after discussion. A motion was made and the proposal was **Approved** w/ 1 Disapprove (P. Becker), 1 Abstention (M. Toth)

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.

Item Number: 20-87	NBIC Location: Part 3, S6.8	No Attachment

General Description: Registered Inspector requirements per DOT

Subgroup: Repairs and Alterations

Task Group: K. Moore (PM)

Explanation of Need: This reference to 49 CFR statutes would clarify the difference between an "Inspector" as used throughout the NBIC and a "Registered Inspector" specific to DOT tank repair/alteration activities.

SG R&A Action: This Item conflicts with Item 20-67 proposal to remove references to Registered Inspector. This will be a Progress Report until 20-67 is decided.

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

Item Number: 20-88	NBIC Location: Part 3, S6.15.1	Attachment 21

General Description: Remove S6.15.1 - It is redundant and is not needed

Subgroup: Repairs and Alterations

Task Group: K. Moore

Explanation of Need: Redundant text. Remove S6.15.1 - It is redundant and is not needed

SG R&A Action: Progress Report
SC ACTION: K. Moore presented that this proposal overlaps with Item 20-67, but made a motion to consider this Item. The Proposal was motioned, seconded, and **Unanimously Approved.**

Item Number: 20-92	NBIC Location: Part 3, 1.5.1 h)	No Attachment

General Description: Changing "Mechanical assembly procedures" to "Mechanical Repair Procedures"

Subgroup: Repairs and Alterations

Task Group: R. Underwood (PM)

Explanation of Need: "Mechanical assembly procedures" appears to be incorrectly referenced in the first sentence of 1.5.1(h) and should state "mechanical repair procedures."

SG R&A Action: Added to Item 19-60 and Closed w/No Action

SC ACTION: Mr. Underwood presented that this Item was added to 19-60 and motioned to **Close w/No Action**. The motion was Unanimously Approved.

Item Number: 21-10	NBIC Location: Part 3, 5.2 &5.4	No Attachment

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

Subgroup: Repairs and Alterations

Task Group: R. Troutt (PM)

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.**

Item Number: 21-11	NBIC Location: Part 3, 2.3	Attachment 22

General Description: Update of SWPS Table 2.3

Subgroup: Repairs and Alterations

Task Group: J. Sekely (PM)

Explanation of Need: NBIC Part 3 should not be used as a catalog enabling the purchase of SWPS's

- A complete listing of all available SWPS's is included in each SWPS
- The web page address for the AWS Bookstore is included in Clause 2.3 of NBIC Part 3
- The Table is extremely difficult to maintain and is prone to errors
- At present, 49 SWPS's are approved for use by the NBIC; 29 have been updated with the remaining 20 still in the B2 committee awaiting AWS Ballot with projected completion in the year 2021 or early 2022.
- As Chair if the B2D subcommittee; it is my intent to submit to ANSI for the "Stabilized Maintenance" program (10 year reaffirmation requirement); So far, 13 Sheetmetal SWPS's were approved by AWS TAC for Stabilized Maintenance

Mr. Sekely's intent was to have this go to SC R&A and MC LB.

SG R&A Action: Proposal was Unanimously Approved

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

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**.

11. Future Meetings

July 12th-15th, 2021 – Cincinnati,
OH January 10th-13th, 2022 – TBD

12. Adjournment

Having no more business, Chairman Troutt adjourned the meeting at 1:48 PM.

Respectfully submitted,

Terrence Hellman

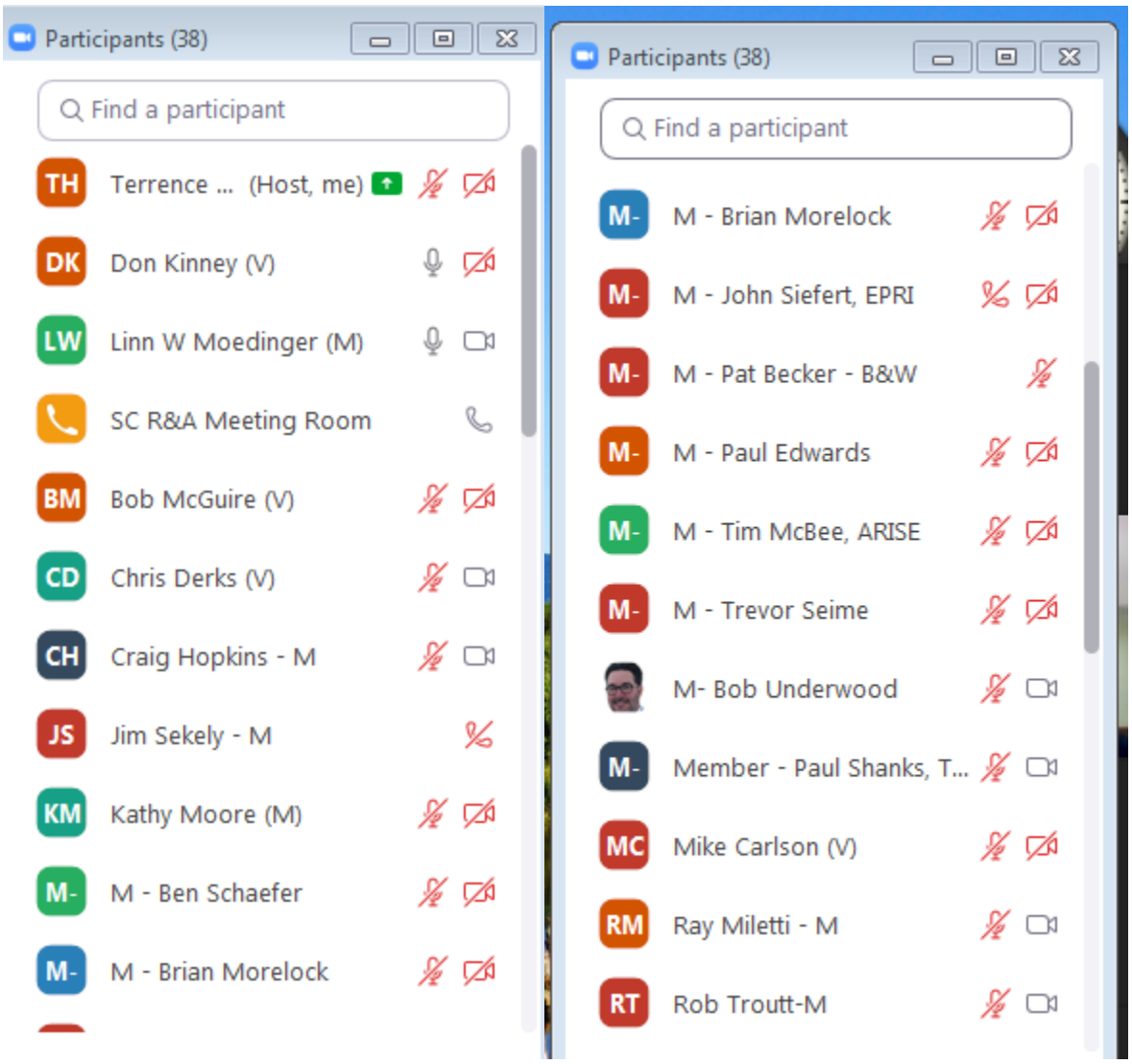
Terrence Hellman

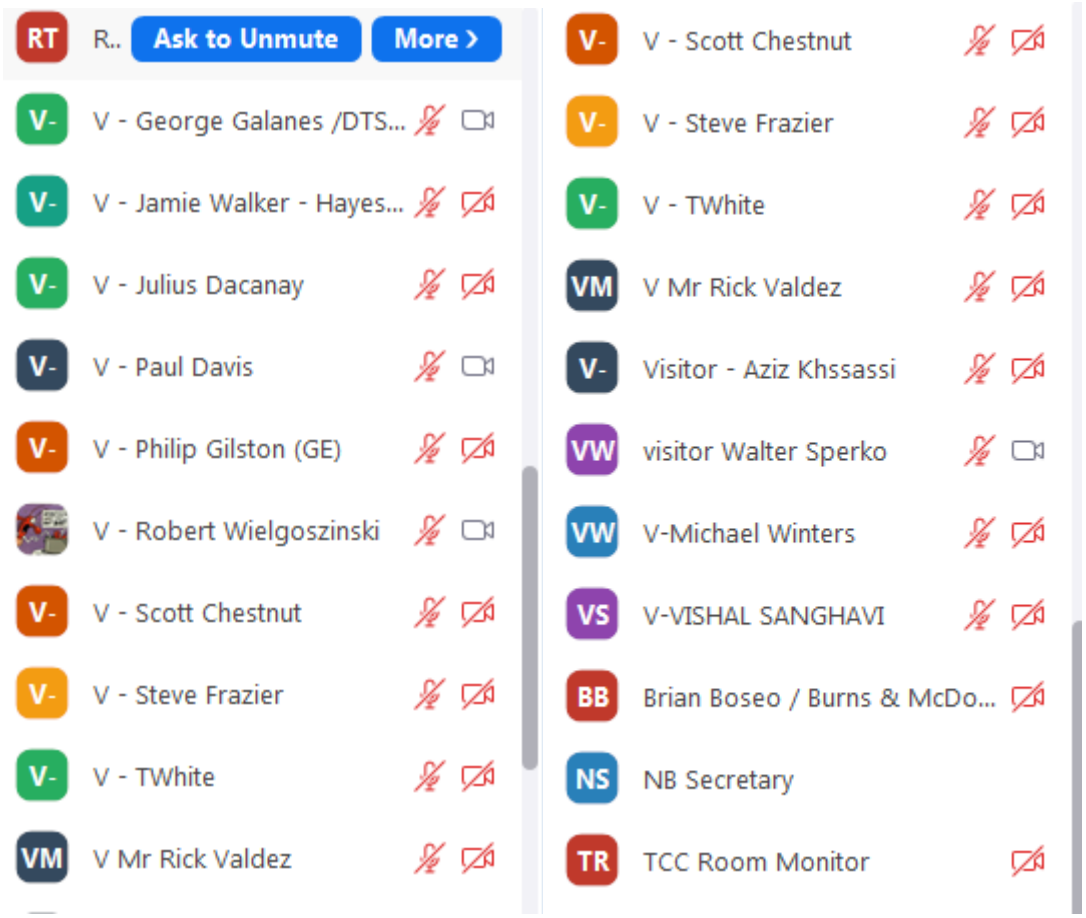
SC R&A Secretary

SC R&A Attendance

Subcommittee Repairs/Alterations

Last Name	First Name	Interest Category	Role	Exp. Date	More
Troutt	Robby	Jurisdictional Authorities	Chair	08/30/2021	Details
Moore	Kathy	National Board Certificate Holders	Vice Chair	01/30/2022	Details
Hellman	Terrence		Secretary	12/30/2099	Details
Becker	Patricia	National Board Certificate Holders	Member	10/30/2022	Details
Boseo	Brian	National Board Certificate Holders	Member	08/30/2021	Details
Edwards	Paul	National Board Certificate Holders	Member	08/30/2021	Details
Hopkins	Craig	National Board Certificate Holders	Member	01/30/2022	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	08/30/2021	Details
Shanks	Paul	Authorized Inspection Agencies	Member	10/30/2022	Details
Siefert	John	General Interest	Member	10/30/2022	Details
Sturm	Rick	Jurisdictional Authorities	Member	07/30/2023	Details
Toth	Marty	General Interest	Member	01/30/2022	Details
Underwood	Robert	Authorized Inspection Agencies	Member	07/30/2023	Details


Participants (38)
Find a participant
TH Terrence ... (Host, me)
DK Don Kinney (V)
LW Linn W Moedinger (M)
SC R&A Meeting Room
BM Bob McGuire (V)
CD Chris Derks (V)
CH Craig Hopkins - M
JS Jim Sekely - M
KM Kathy Moore (M)
M- M - Ben Schaefer
M- M - Brian Morelock
Participants (38)
Find a participant
M- M - Brian Morelock
M- M - John Siefert, EPRI
M- M - Pat Becker - B&W
M- M - Paul Edwards
M- M - Tim McBee, ARISE
M- M - Trevor Seime
M- Bob Underwood
M- Member - Paul Shanks, T...
MC Mike Carlson (V)
RM Ray Miletti - M
RT Rob Troutt-M


RT R.. Ask to Unmute More ›
V- V - George Galanes /DTS...
V- V - Jamie Walker - Hayes...
V- V - Julius Dacanay
V- V - Paul Davis
V- V - Philip Gilston (GE)
V- V - Robert Wielgoszinski
V- V - Scott Chestnut
V- V - Steve Frazier
V- V - TWhite
VM V Mr Rick Valdez
V- V - Scott Chestnut
V- V - Steve Frazier
V- V - TWhite
VM V Mr Rick Valdez
V- Visitor - Aziz Khssassi
VW visitor Walter Sperko
VW V-Michael Winters
VS V-VISHAL SANGHAVI
BB Brian Boseo / Burns & McDo...
NS NB Secretary
TR TCC Room Monitor

PROPOSED INTERPRETATION

Inquiry No.	**20-11**
Source	Hugh-Jean Nel, Sasol Hugh-Jean.Nel@sasol.com
Subject	Scope of Repairs **Background:** Historically NBIC has not defined limitations on the scope of repair provided the entire item is being rebuilt, see Question & Reply 2 & 3 in Interpretation 98-28. NBIC Part 3 lists several examples of repair but nowhere limits the scope or amount of these examples that can be utilized when performing repairs. This creates some uncertainty when performing some types of repairs, such as replacing the tubesheets of a fixed tubesheet type heat exchanger as listed in 3.3.3 e). According to ASME BPV Code Section VIII Division 1 Part UHX, Section 13, the length of the tubes is a design parameter and therefore replacing the tubesheet in accordance with its original design might require the replacement of the tubes as well to maintain the original design length.
Edition	2019; Part: Repairs and Alterations; Section: 3; Paragraph: 3.3.3 Examples of Repairs
Question	Question: Is it permissible for repair activities performed on pressure retaining item to have more than one activity listed in 3.3.3 with the scope of repair?
Reply	Proposed Reply: Yes, ~~provided that the scope of repairs has been approved by the Inspector, and when required, by the Jurisdiction.~~
Committee's Question 1	~~Can~~ May multiple repair activities referenced in 3.3.3 of Part 3 be listed on a single Form R-1 Report when performing a repair on a pressure retaining item?
Committee's Reply	Yes
Rationale	There is nothing in the NBIC that restrict the repair work performed on one vessel at the same time.
Committee's Question 2	Other than tube plugging, ~~I~~is it considered an alteration when the heat transfer surface(s)~~tube length~~ of a heat exchanger is ~~changed~~ changed from its original design~~while replacing tube sheets~~ on a ~~ASME~~ ~~Section VIII, Div 1~~ pressure vessel?
Committee's Reply	Yes~~.~~ Reference NBIC Part 3,. 3.4.4 d)
Rationale:	~~The tube length is a dimension as mentioned in 3.4.4. d~~

Interp 20-11

3.4.4 EXAMPLES OF ALTERATIONS

d) A change in the dimensions or contour of a pressure-retaining item;

3.3.3 EXAMPLES OF REPAIRS

e) Replacement of heat exchanger tubesheets in accordance with the original design;

INTERPRETATION 98-28

Subject: RC-1050(c) Replacement Parts Fabricated by an "R" Certificate Holder
Appendix 6 Pressure Retaining Replacement Items
RC-1050 Definition of New Replacement Parts

1998 Edition

Question 1: Does RC-1050(c) of the NBIC permit the holder of an "R" Certificate to fabricate by welding new and exact pressure retaining replacement parts for an ASME stamped item that the "R" stamp holder is repairing?

Reply 1: No. ASME replacement parts fabricated by welding that require shop inspection by an Authorized Inspector shall be fabricated by an organization having an appropriate ASME Certificate of Authorization.
Question 2: An ASME stamped item is determined to be corroded beyond repair and the only salvageable part is the ASME Code stamping or nameplate. Is it the intent of the NBIC to permit a holder of an "R" Certificate only to build a complete new and exact pressure retaining replacement item using the original ASME construction Code, Section, Edition and Addenda and same materials, transfer and document the transfer of the ASME stamping or nameplate on an R-1 Form to the new pressure-retaining item and stamp the repair with the "R" stamp?
Reply 2: No.
Question 3: Does the NBIC define the point at which a repair becomes new construction?
Reply 3: No.

PROPOSED INTERPRETATION

Inquiry No.	**20-66** **NBIC Location: Part 3, 3.3.2 e) (Addition of non-load bearing attachments)**
Source	Alex Garbolevsky – Hartford Steam Boiler
Subject	The reason for the interpretation request is that two previously published NBIC Interpretations and the NBIC itself seem to be contradictory. Interpretations 95-14 and 95-21 lead the reader to conclude that if the original vessel was postweld heat treated, then the addition of refractory clips by welding, regardless of size, without postweld heat treatment is an alteration. However, NBIC Part 3 [2019 Edition], 3.3.3 b)1) and 2) list addition of welded attachments to pressure parts, such as: Studs for insulation or refractory lining and hex steel or expanded metal for refractory lining as “Examples of Repairs”. Furthermore, NBIC Part 3 [2019 Edition], 3.3.2 e) 2) states: “The following repairs may be considered as routine repairs and shall be limited to these categories: 2) The addition or repair of non-load bearing attachments to pressure-retaining items *where postweld heat treatment is not required*;
Edition	2019
Question	An ASME BPV Code Section VIII, Div. 1 pressure vessel (P-No. 1, 2-1/4 in thick), fabricated in 1971, was completely postweld heat treated (PWHT) in an oven. The vessel nameplate is marked “HT”. No special service applies. In 2020, refractory clips are added by welding. The attachment welds are of such size that they are exempted from PWHT per ASME BPV Section VIII, Div. 1, 2019 Edition, Table UCS-56-1 General Note (b)(3)(c). May the welding of the refractory clips be considered as a “routine repair” under NBIC (2019) Part 3, 3.3.2 e) 2)?
Reply	Yes
Committee’s Question	May non-load bearing attachments welded directly to an ASME Section VIII, Div. 1 pressure vessel that has full postweld heat treatment reported on the ASME Manufacturer’s Data Report be considered a routine repair without subsequent postweld heat treatment or post weld heat treatment alternatives?
Committee’s Reply	Yes, provided the attachment welds ~~is~~are exempted from post weld heat treatment by the original construction Code and service related conditions.
Rationale	After discussion, it was determined that 3.3.2(e)(2) permits addition of non-load bearing attachments when the repair weld is exempted from post weld heat treatment by the original construction code.
SC Vote	

NBIC Vote	
Negative Vote Comments	

(f) See below.

(1) The letters HT shall be applied under the Designators when the complete vessel has been postweld heat treated as provided in UW-10.

(2) The letters PHT shall be applied under the Designators when only part of the complete vessel has been postweld heat treated as provided in UW-10.

The extent of the postweld heat treatment shall be noted on the Manufacturer's Data Report.

Interpretation: (NBIC) 95-14

Subject: R-202 Alteration, 1992 Edition with the 1994 Addenda

Date Issued: N/A

File: N/A

Question: May a welded repair to a pressure vessel be performed without postweld heat treatment or acceptable alternative to postweld heat treatment, when the pressure vessel as reported on the data report was postweld heat treated during construction?

Reply: No.

INTERPRETATION 95-21

Subject: Appendix 4, Definition of Alteration, 1995 Edition

Question: May an ASME Section VIII, Division 1 pressure vessel that has postweld heat treatment reported on an ASME Manufacturer's Data Report, be repaired by welding without subsequent postweld heat treatment or postweld heat treatment alternatives?

Reply: No. This is an alteration.

INTERPRETATION 20-77
Authorization of repair/alteration activities

Inquiry No.	20-77
Source	Paul Shanks Email: paul.shanks@onecis.com Phone: +1 (832) 316.4249
Subject	Many R-certificate holders also have U or S stamps and as such have a regular AI (with R endorsement) to whom they tend to have review repair and alteration packages. However when the physical work will be conducted 'out of state' travel limitations and or jurisdictional authorization requirement prevent the local AI from making the final acceptance inspection thus another AI must do that work, para 1.3.2 a) makes clear that both Inspectors have to be employed by the same agency. Form R-2 has 2 Inspector sign off locations but does not make clear if the two Inspectors must be from the same AIA or not. Background Information: Paragraph 1.3.2 a) situates that the inspectors that authorizes the repair/alteration and the inspector that performs the acceptance inspection be employed by the same AIA. However the activity of authorizing the repair/alteration is not defined and it is not clear what constitutes authorization. Given that form R-2 has sign off locations for design and constructions, if two different Inspectors sign, should they be employed by the same agency?
Edition	Part 3 1.3.2
Question	Q1: Given the restriction of employment in paragraph 1.3.2 a) if two inspectors are signing an R-2 may they be employed by different AIA's?; Q2: if the answer to the above is yes, does this mean the Inspector making the final acceptance inspection is the only Inspector that is suitable to authorize the inspection?
Reply	A1: No A2: Yes
Committee's Question	Q1: May inspectors employed by two different AIA's complete the inspector certifications on the Form R-2? Q2: Must the inspector signing the Certificate of Inspection on the Form R-2 be the same inspector, or employed by the same AIA as the inspector, who authorized the construction work for the alteration?
Committee's Reply	A1: Yes. A2: Yes.
Rationale	Q1: NBIC Part 3, 5.2.2(a) and (c). Q2: NBIC Part 3, 1.3.2(a) and 5.2.2(c).

SC Vote	
NBIC Vote	
Negative Vote Comments	

INTERPRETATION 20-89

LIQUID PRESSURE TEST EXAMINATION METHODS APPLICABLE TO ALTERATIONS -

Inquiry No.	20-89
Source	Jagadheesan Vellingiri Muthukumaraswamy Email: jaga4021@hotmail.com Phone: +1 (91) 9944208398
Subject	For an ASME SEC VIII Div 2, Class 1 or Class 2 / ASME SEC I / ASME B 31.1 Equipment is Subjected to Alteration due to Increase in MAWP.
Edition	2019 Edition Part 3: 4.4.1 & 4.4.2 Examination and testing
Question	1. Is it the Intent of the Code that the Minimum Pressure for Liquid Pressure Test for Alteration Shall be as per Original Code of Construction? 2. Can Pressure Test Be Conducted at Design Pressure or MAWP for Alteration Considering Remaining Thickness or Corrosion Condition considering Integrity of the Equipment?
Reply	1. Yes 2. No
Committee's Question	Q1: When conducting a liquid pressure test of an alteration activity as described in 4.4.2(a)(1), shall the minimum required test pressure be as specified in the original code of construction? Q2: When conducting a liquid pressure test of an alteration activity as described in 4.4.2(a)(1), may the minimum required test pressure be as adjusted based on the remaining corrosion allowance when the original test pressure included consideration of corrosion allowance.
Committee's Reply	A1:Yes, A2: Yes, ~~provided the minimum test pressure is in compliance with the original code of construction.~~
Rationale	
SC Vote	
NBIC Vote	
Negative Vote Comments	

INTERPRETATION 20-90
1.4.1 ACCREDITATION PROCESS / NB-415- Certification of Scope

Inquiry No.	20-90
Source	Jagadheesan Vellingiri Muthukumaraswamy Email: jaga4021@hotmail.com Phone: +1 (91) 9944208398
Subject	The NBIC Certification scope Does not Restrict the Repair Organization to Perform Based on their ASME Certification of scope, as long as Manual Controls are addressed for the Design and Repair/ Fabrication Scope they can perform Repair and Alteration. A Repair Organization is Holding an valid R certification under NBIC, and Holds Valid ASME- U Authorization. The Certifcation Scope Under NBIC is issued for Metallic Repair and Alteration, Can the Repair Organization Perform Repair and Alteration on ASME Sec VIII Div 2 / 3 and Section 1 Components
Edition	Part 3 1.4.1
Question	1. Is it the Intent of Code that based on the Initial Certification under 1.4.1 / NB-415 Process and Quality manual Restriction that if the Repair Organization is Authorized for Repair and Alteration on Sec VIII Div 1 Vessels only they are entitled to Perform Repair and alteration of Sec VIII Div 1 Vessels? 2. If the Answer to above Question is No then can the Repair Organization Perform Repair and Alteration on Sec VIII Div 2/Div 3 and Section 1 Components if the controls are addressed in Manual?
Reply	1. No 2. Yes
Committee's Question	Is it required for an "R" Certificate of Authorization holder to also hold a Certificate of Authorization ~~issued by~~for the ~~PRI's~~ pressure retaining item's original Code of Construction (e.g. ASME Section VIII Div. 1) for which a repair or alteration is to be completed?
Committee's Reply	No
Rationale	The NBIC does not restrict the "R" Certificate of Authorization holder to making repairs and/or alterations to specific Codes of Construction. It does require that the "R" Certificate of Authorization holder have the capabilities to make the repairs and/or alterations in accordance with the original code of construction.
SC Vote	
NBIC Vote	
Negative Vote Comments	

PROPOSED INTERPRETATION

Inquiry No.	**20-91**
Source	Robert Underwood – Hartford Steam Boiler
Subject/Background	To determine if procedures are required for mechanical repairs/assemblies as referenced in Part 3, paragraph 1.5.1(h). Part 3, para. 1.5.1(h), requires that control of mechanical assembly/repair procedures be addressed in the R Certificate Holder's Quality Manual. Over the last year or so, there have been National Board Team Leaders requesting these procedures (during joint reviews) for work such as rolling tubes in a boiler and replacing a bolted fitting on a pressure retaining item. This has resulted in confusion and several questions from certificate holders and Inspectors about why an "R" certificate holder is required to have procedures for mechanical work that doesn't even require an "R" Stamp.
Edition	2019; Part 3: Repairs and Alterations; Section 1, paragraph 1.5.1(h)
Question	Are mechanical repair/assembly procedures that are referenced in Part 3, paragraph 1.5.1(h), required for work that does not require an “R” Form?
Reply	Proposed Reply: No
Committee’s Question 1	For an~~Is a~~ “R” Certificate of Authorization holder, is it required to have mechanical repair/assembly procedure(s) in accordance with Part 3, 1.5.1 h) ~~mandatory~~ for work that does not require an R Form?
Committee’s Reply	No, provided it is not required by the Jurisdiction.
Rationale	There are many interpretations addressing mechanical work, replacing boiler tubes “non welded”, repairing studded outlet threads “no welding” the NBIC does not address non welded repairs (mechanical), nor requires a written procedure or a repair plan when this work does not require an R Form.
SC Vote	
NBIC Vote	
Negative Vote Comments	

Part 3, 1.5.1(h)

h) Repair and Alteration Methods

The manual 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.

Part 3, Supplement 9 - Glossary

Mechanical Assembly — The work necessary to establish or restore a pressure retaining boundary, under supplementary materials, whereby pressure-retaining capability is established through a mechanical, chemical, or physical interface, as defined under the rules of the NBIC.

Mechanical Repair Method — A method of repair, which restores a pressure retaining boundary to a safe and satisfactory operating condition, where the pressure retaining boundary is established by a method other than welding or brazing, as defined under the rules of the NBIC.

Item Number: 19-16: Reword to provide clarity; contradictory requirement Part 3; 3.2.2 e)

PM: Tom White

Submitted By: Eben Creaser

Background Information: The second sentence of 3.2.2 e) seems to provide optional provisions that contradict the mandatory requirement stated in the first sentence that requires 3.2.2 c) or d) parts to be pressure tested by the original code of construction. If this is the intent of the committee then the clause should be reworded to add an "or" between the sentences. The wording could also be understood to mean that all parts addressed in 3.2.2 c) or d) have to be pressure tested. But then the second sentence eludes to an optional requirement, its just not clear

Explanation of Need: This wording of this clause is causing confusion. I have had multiple instances where owners have requested to purchase welded replacement parts directly and read this clause with the belief that they can purchase a replacement part for in some cases a welded pressure part for an ASME Section I boiler and safe money by having the fabricator not Hydro test as per Section I even when its was not impractical to have the testing performed.

Date Opened: **2/13/2019**

3.2.2 REPLACEMENT PARTS

Replacement parts to be used in repairs or alterations shall meet the following applicable requirements:

a) Replacement parts that will be subject to internal or external pressure that consist of new materials which should be formed to the required shape by casting, spinning, forging, die forming, and on which no fabrication welding is performed, shall be supplied as material. Such parts shall be marked with the material and part identification and the name or trademark of the parts manufacturer. In lieu of full identification marking on the material or part, the part manufacturer may use a coded marking system traceable to the original marking. Such markings shall be considered as the parts manufacturer’s certification that the part complies with the original code of construction. Examples include seamless or welded tubes or pipe, forged nozzles, heads or tubesheets, or subassemblies attached together mechanically;

b) Replacement parts that will be subject to internal or external pressure that are preassembled by attachment welds shall have the welding performed in accordance with the original code of construction. The supplier or manufacturer shall certify that the material and fabrication are in accordance with the original code of construction. This certification shall be supplied in the form of bills of material and drawings with statement of certification. Examples include boiler furnace wall or floor panel assemblies, prefabricated openings in boiler furnace walls, such as burner openings, air ports, inspection openings, or sootblower openings;

c) When ASME Code is the original code of construction, replacement parts subject to internal or external pressure fabricated by welding, which require inspection by an Authorized Inspector shall be fabricated by an organization having an appropriate ASME *Certificate of Authorization*. The item shall be inspected and stamped as required by the applicable section of the ASME Code. A completed ASME *Manufacturer’s Partial Data Report* shall be supplied by the manufacturer.

    1) ASME stamping and completion of an ASME Manufacturer’s Partial Data Report is not required for parts fabricated by the “R” Certificate Holder that will be used on pressure retaining items being repaired or altered by the same “R” Certificate Holder. The controls for this activity shall be described in the quality control system.

2) The “R” Certificate Holder, using replacement parts fabricated and certified to an ASME Code edition and addenda different from that used for the original construction, shall consider and seek technical advice, where appropriate, for change or conflicts in design, materials, welding, heat treatment, examinations and tests to ensure a safe repair/alteration is performed. Note that work once classified as a repair could now be considered an alteration.

d) When the original code of construction is other than ASME Code, replacement parts subject to internal or external pressure, fabricated by welding, shall be manufactured by an organization certified as required by the original code of construction. The item shall be inspected and stamped as required by the original code of construction. Certification to the original code of construction, as required by the original code of construction or equivalent, shall be supplied with the item. When this is not possible or practicable, the organization fabricating the part shall have a National Board “R” *Certificate of Authorization*; replacement parts shall be documented on Form R-3 and the “R” Symbol Stamp applied as described in NBIC Part 3, Section 5.

e) Current Wording (2019):

e) Replacement parts addressed by 3.2.2 c) or d) above shall receive a pressure test as required by the original code of construction. If replacement parts have not been pressure tested as required by the original code of construction prior to installation they may be installed without performing the original code of construction pressure test provided the owner, the Inspector and, when required, the Jurisdiction accept the use of one or a combination of the examination and test methods shown in Part 3, Section 4, paragraph 4.4.1 (for repairs) or 4.4.2 (for alterations). The R Certificate Holder responsible for completing the R Form shall note in the Remarks section of the R Form the examination(s) and test(s) performed, and the reason the replacement part was not tested in accordance with the original code of construction.

e) Proposed Wording:

e) Replacement parts addressed by 3.2.2 c) or d) above shall receive a pressure test as required by the original code of construction. When it is not practicable to perform the required pressure test prior to installation, the replacement parts may be installed without performing the original code of construction pressure test provided the owner, the Inspector and, when required, the Jurisdiction accept the use of one or a combination of the examination and test methods shown in Part 3, Section 4, paragraph 4.4.1 (for repairs) or 4.4.2 (for alterations). The R Certificate Holder responsible for completing the R Form shall note in the Remarks section of the R Form the examination(s) and test(s) performed in lieu of pressure test, and the reason it was not practicable to pressure test the replacement part in accordance with the original code of construction.

ITEM 19-60

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 consist of several documents~~brief or voluminous~~, depending on the projected scope of work. 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 required~~ features outlined in this section~~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 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.

b) Content Page

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) 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 *Statement* shall 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 be brought to the attention of the Certificate Holder's

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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) Manual Quality System Control

The Quality System manual shall define how include the necessary provisions for revisions of individual subjects, 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 approvale 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) 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) 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. In addition, roles and responsibilities associated with the functional job titles identified within the organizational chart, 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.

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~~g~~h) 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 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~~h~~) Repair and Alteration Methods

The ~~manual~~Quality System shall include controls for repairs and alterations, including mechanical ~~assembly~~ repair procedures, materials, ~~nondestructive examination~~NDE 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.

j~~i~~) 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.

k~~j~~) Method of Performing Work

The Quality System~~manual~~ 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.~~

l~~k~~) Welding, NDE and Heat Treatment

The ~~manual~~ Quality System shall describe controls for welding, ~~nondestructive examination~~NDE, and heat treatment.

1) Welding – The Quality System~~manual is to~~ shall indicate the title and qualifications 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 only ~~welding procedure specification~~WPS's and welders or welding operators qualified ~~, as required by the NBIC,~~ be used in the repair or alteration of pressure-retaining items. It is also essential that ~~that welders and welding operators maintain their~~ continuity for welders and welding operators be maintained~~proficiency~~ as required by the

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NBIC, while engaged in the repair or alteration of pressure-retaining items. The ~~manual~~Quality 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. ~~Similar responsibility for nondestructive examination and heat treatment shall be described in the manual.~~

2) ~~Nondestructive examination~~NDE – The title 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 manual~~the Quality System indicate~~s~~ the individual(s) responsible for the review and acceptance of subcontracted NDE procedures and personnel. When NDE is performed in-house, the individual responsible for the written practice and the standard used for the basis of training, qualification, and records shall be documented.

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

~~l~~m) Examinations and Tests

The Quality System~~Reference~~ 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.

~~m~~n) Calibration

The Quality System~~manual~~ 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 calibrate~~d~~tion date as well as a specified next calibration due date.

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

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

4) A statement that all calibrations will be ~~tracible~~traceable to the National Institute of Standards and Technology (NIST) or another nationally recognized Standards Organization~~, as much as practical~~. When no nationally recognized standard exists, the basis for calibration shall be described~~documented~~.

o~~n~~) ~~Approval, Inspection,~~Authorization and Acceptance ~~and Inspection~~ of Repair and/or Alteration

The Quality System~~manual~~ 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.

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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.

po) Inspections and InspectionsDocument Review

The manual Quality System shall make provisions for the Inspector to have access to the physical work, including 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.

pq) Control of 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.

prq) Report of Repair or Alteration Form

The Quality Systemmanual shall indicate the title of the individuals responsible for preparing, signing, and presenting the NBIC Report Forms to the Inspector. The Inspector shall confirm NBIC compliance by signing 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.

qsr) 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 as long as they contain the same information as the exhibited forms without the need for acceptance by the Inspector.The name and accepted abbreviations of the "R" Certificate Holder shall be included in the manual.

rts) 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.

sut) Nonconformances
ing Items

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A~~There shall be a~~ system shall be established to identify and control a product or service ~~a nonconformance ocurrs any characteristics do not conform in adherence~~which does not conform to the applicable rules of the NBIC, code of construction ~~code~~, or jurisdictional requirements, 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, the responsibility and authority for the disposition of a nonconformance ~~nonconforming items~~shall be defined including provisions for Inspector involvement~~Nonconformance must be corrected or eliminated before the repaired or altered component can be considered in compliance with the NBIC~~. It is also essential that systemic or programmatic nonconformances be identified and corrected ~~and when necessary, corrected~~ within the Quality System.

~~t~~v~~u~~) Records Retention

The ~~quality manual~~Quality System shall describe a 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 follow the instructions identified in NBIC Part 3, Table 1.5.1.

NB19-68
NR Program Requirements
Endorsement requirements for the Inspector
RVW 01/09/21

Scope: Review Part 3, paragraph 1.6 for the need to define or elaborate on the Endorsement requirements for the ANI inspecting within the NR Program.

Statement of need:
Currently the NBIC only defines the need for the ANI to hold a valid commission with the appropriate endorsement (Ref Part 3, para 1.3). But the concern expressed was that the NBIC does not specify what commission or endorsement is actually required to make inspections. The provisions for qualification of Inspectors, including Endorsements is specified in RCI-1 (NB-263), Rules for Commissioned Inspectors. This document specifies the duties of Inspectors and Supervisors as well as the qualification.

There seems to be a gap in the NBIC with regard to making it clear which Commission and which Endorsement(s) are required to be maintained for the Inspector. So this change to the NBIC is to close that gap without having to repeat the detailed information from RCI-1 into the NBIC. And only pertinent references to RCI-1 are included.

Narrative:
A little history first…In 2010(?) the National Board split the National Board Commission into two separate and distinct Commissions. The IS Commission for the qualification of Inspectors performing inservice inspection of boilers and pressure vessels. (Note here that this does NOT include inservice inspection of nuclear equipment. The second endorsement was the AI Commission, which was for the qualification of Inspectors performing new construction (i.e. ASME) inspection. The purpose of this split was to make it easier for candidates to obtain a Commission to perform new construction inspections. Previous to then, all Inspectors held the single commission which was based on inservice inspection of B/PV's. There were several other advantages to creating the split, but they are not germane to this discussion.

Supporting the new construction theory was the need to focus additional qualification and training for different segments of the B/PV industry, and the role established by ASME for Inspector Supervisors. To achieve this special Endorsements were available for these needs. The table below summarizes these endorsement and their applicability.

Endorsement	Activity
A *	Inspection of ASME non nuclear B/PV's. ASME Sections I, IV, VIII, X, and XII
N	Inspection of ASME nuclear components. ASME Section III Division 1
I	ASME Inservice Inspection of nuclear power plants, ASME Section XI.
C	Inspection of ASME nuclear concrete components. ASME Section III Division 2
B	Supervision of A endorsed Inspectors
S	Supervision of N endorsed Inspectors
IS	Supervision of I endorsed Inspectors
CS	Supervision of C endorsed Inspectors

*Ultimately dropped and made part of the AI Commissioning process.

It should ne noted that these endorsements may only be obtained by a new construction Inspector, or an AI Commissioned Inspector. They were not made available to the IS Commissioned Inspector.

Repair work was considered an inservice (not nuclear) activity and not new construction. Therefore an Inspector performing any repair or alteration work needed to hold the IS commission for this purpose. This would include any work in accordance with Part 3 of the NBIC. You can recall that the NR program

contained an additional requirement that the Inspector must be an Authorized Nuclear Inspector, which would require him to hold the N endorsement.

It was several years later that the National Board determined that repair and alteration work was rather unique since the NBIC contains some special rules that modify or augment the rules on the Code of Construction, i.e. ASME BPV Code. So the National Board created the R endorsement dealing solely with the rules and activities on the NBIC. And they also deemed that the endorsement could be held by either an IS Inspector or an AI Inspector.

As we progressed through time there was never an issue within the NBIC as to which Inspector could perform inspections of repairs/alteration. As long as the individual held a NB Commission they were good to go. But with the advent of the Commission splitting process and development of the R endorsement it makes a difference today who may perform such inspections. And just a bit more complicated with the NR Program.

So now may be the time to make it clear in the NBIC which individuals may make repair and alteration inspections, including the additional requirements for the NR program. RCI-1 contains all the rules for qualification, examination, and maintenance of Commissions and Endorsements. Also, it contains the duties of the Inspectors and Supervisors. There is no need to repeat the information, but with some additional changes to the NBIC Part 3, we can point the reader to RCI-1 to obtain any detailed information they may need.

With regard to the NR Program, is noted that the Authorized Nuclear Inspector (ANI) provisions for Category 3 lack some of the fundamentals that would apply to all Categories of Activities under the NR Program. A change should be made to incorporate some of those fundamentals into Cat 3 activity.

Proposal:

1) Revise paragraph 1.3 to make reference to RCI-1 for qualifications of Inspectors/Supervisors.

2) Revise paragraphs 1.6.6.2 t) and 1.6.7.2 t) to reference 1.6.9, Interface with the Owner.

3) Revise paragraph 1.6.8.2 t) to be more in line with 1.6.6.2 and 1.6.7.2.

THIS PAGE FOR INFORMATION ONLY

1.6.6.2 t) *(NOTE: applicability to Category 1)*

t) Authorized Nuclear Inspector

Measures shall be taken to reference the commissioned rules for National Board Authorized Nuclear Inspector, in accordance with NB-263, RCI-1 *Rules for Commissioned Inspectors*. The “NR” Certificate Holder shall ensure that the latest documents including the Quality Assurance Manual, procedures and instructions are made available to the Authorized Nuclear Inspector. The Authorized Nuclear Inspector shall be consulted prior to the issuance of a repair/replacement plan by the “NR” Certificate Holder in order that the Authorized Nuclear Inspector may select any in-process inspection or hold points when performing repair/replacement activities. The “NR” Certificate Holder shall keep the Authorized Nuclear Inspector informed of progress of the repair/replacement activity so that inspections may be performed. The Authorized Nuclear Inspector shall not sign Form NR-1 or Form NVR-1, as applicable, unless satisfied that all work carried out is in accordance with this Section. The Authorized Nuclear Inspector and Authorized Nuclear Inspector Supervisor shall have access to areas where work is being performed including subcontractors facilities in order to perform their required duties. The ANI shall be involved in dispositions and verification for non-conformances and corrective actions involving quality or code requirements.

1.6.7.2 t) *(NOTE: Applicability to Category 2)*

t) Authorized Nuclear Inspector

Measures shall be taken to reference the commissioned rules for National Board Authorized Nuclear Inspector, in accordance with NB-263, RCI-1 *Rules for Commissioned Inspectors*. The “NR” Certificate Holder shall ensure that the latest documents including the Quality Assurance Manual, procedures and instructions are made available to the Authorized Nuclear Inspector. The Authorized Nuclear Inspector shall be consulted prior to the issuance of a repair/replacement plan by the “NR” Certificate Holder in order that the Authorized Nuclear Inspector may select any in process inspection or hold points when performing repair/replacement activities. The “NR” Certificate Holder shall keep the Authorized Nuclear Inspector informed of progress of the repair/replacement activity so that inspections may be performed. The Authorized Nuclear Inspector shall not sign Form NR-1 or Form NVR-1, as applicable, unless satisfied that all work carried out is in accordance with this section. The Authorized Nuclear Inspector and Authorized Nuclear Inspector Supervisor shall have access to areas where work is being performed including subcontractors facilities in order to perform their required duties. The ANI shall be involved in dispositions and verification for nonconformances and corrective actions involving quality or code requirements.

1.6.8.2 t) (*NOTE: Applicability to Category 3. Also, the references to 1.6.6.2 s) and 1.6.7.2 s) are related to Audits. The text therein is almost identical to 1.6.8.2 s) except there is no reference to mandatory compliance to ASME NQA-1 for Category 3.)*

t) Authorized Nuclear Inspector

Qualifications and duties shall be as specified in ASME QAI-1 and NB-263, RCI-1 for the Authorized Inspection Agencies, Authorized Nuclear Inspector and the Authorized Nuclear Inspector Supervisor. Additional requirements are specified in NBIC Part 3, 1.6.6.2 s), 1.6.7.2 s), and 1.6.9.

THIS PAGE FOR INFORMATION ONLY

1.6.9 INTERFACE WITH THE OWNER'S REPAIR/REPLACEMENT PROGRAM (FOR CATEGORIES 1, 2, AND 3 AS APPLICABLE)

Interface with the owner's repair/replacement program shall meet the following:
a) The "NR" Certificate Holder's repair/replacement plan (see Table 1.6.9) shall be subject to the acceptance of the owner and the owner's Authorized Nuclear Inservice Inspector (ANII) and shall be subject to review by the Jurisdiction and Regulatory Authorities having jurisdiction at the plant site.

b) Repair/Replacement activities of nuclear components shall meet the requirements of ASME Section III, ASME Section XI, and/or other applicable standard, and the owner's requirements, and shall be subject to verification by the Jurisdiction and Regulatory Authorities having jurisdiction at the plant site.

c) Documentation of the repair/replacement activities of nuclear components shall be recorded on the Report of Repair/Replacement Activities of Nuclear Components and Systems for Nuclear Facilities, Form NR-1, or Report of Repair/Replacement Activities for Nuclear Pressure Relief Devices, Form NVR-1, in accordance with the NBIC Part 3, Section 5. The completed forms shall be signed by a representative of the "NR" Certificate Holder and the Authorized Nuclear Inspector when the repair/replacement activity meets the requirements of this section. For repair/replacement activities that involve design changes, Form NR-1, or Form NVR-1, as applicable, shall indicate the organization responsible for the design or design reconciliation in accordance with the owner's requirements.

d) The "NR" Certificate Holder shall provide a copy of the signed Form NR-1 or Form NVR-1, as appli cable, to the owner, the Enforcement, and the Regulatory Authority if required, and the Authorized Nuclear Inspection Agency. The original Form NR-1 or Form NVR-1, as applicable, shall be registered with the National Board by the "NR" Certificate Holder. A NB registration log shall be maintained by the "NR" Certificate Holder. See NBIC Part 3, Section 5.5 and 5.6.

e) The "NR" Certificate Holder shall provide a nameplate/stamping for repair/replacement activities for each nuclear component unless otherwise specified by the owner's Quality Assurance Program. The required information and format shall be as shown in NBIC Part 3, Section 5.

Existing	Proposed
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 (see NBIC Part 3, Section 9, Glossary of Terms for definition of Authorized Inspection Agency).	**1.3 INSPECTOR** a) Inspection and certification shall be made by an Inspector holding a valid **National Board** Commission with the **"R"** ~~appropriate~~ endorsement issued by the National Board and employed by an Authorized Inspection Agency **in accordance with RCI-1.** (see NBIC Part 3, Section 9, Glossary of Terms for definition of Authorized Inspection Agency).
1.6.6.2 t) t) Authorized Nuclear Inspector Measures shall be taken to reference the commissioned rules for National Board Authorized Nuclear Inspector, in accordance with NB-263, RCI-1 *Rules for Commissioned Inspectors*. The "NR" Certificate Holder shall ensure that the latest documents including the Quality Assurance Manual, procedures and instructions are made available to the Authorized Nuclear Inspector. The Authorized Nuclear Inspector shall be consulted prior to the issuance of a repair/replacement plan by the "NR" Certificate Holder in order that the Authorized Nuclear Inspector may select any in-process inspection or hold points when performing repair/replacement activities. The "NR" Certificate Holder shall keep the Authorized Nuclear Inspector informed of progress of the repair/replacement activity so that inspections may be performed. The Authorized Nuclear Inspector shall not sign Form NR-1 or Form NVR-1, as applicable, unless satisfied that all work carried out is in accordance with this Section. The Authorized Nuclear Inspector and Authorized Nuclear Inspector Supervisor shall have access to areas where work is being performed including subcontractors facilities in order to perform their required duties. The ANI shall be involved in dispositions and verification for non-conformances and corrective actions involving quality or code requirements.	Add the following: **The Authorized Nuclear Inspector shall hold the "N", "I", and "R" endorsements on his/her Commission.** **Additional requirements regarding Owner Interface are specified in 1.6.9**
1.6.7.2 t) t) Authorized Nuclear Inspector Measures shall be taken to reference the commissioned rules for National Board Authorized Nuclear Inspector, in accordance with NB-263, RCI-1 *Rules for Commissioned Inspectors*. The "NR" Certificate Holder shall ensure that the latest documents including the Quality Assurance Manual, procedures and instructions are made available to the Authorized Nuclear Inspector. The Authorized Nuclear Inspector shall be consulted	Add the following: **The Authorized Nuclear Inspector shall hold the "N", "I", and "R" endorsements on his/her Commission.**

Existing	Proposed
prior to the issuance of a repair/replacement plan by the “NR” Certificate Holder in order that the Authorized Nuclear Inspector may select any in-process inspection or hold points when performing repair/replacement activities. The “NR” Certificate Holder shall keep the Authorized Nuclear Inspector informed of progress of the repair/replacement activity so that inspections may be performed. The Authorized Nuclear Inspector shall not sign Form NR-1 or Form NVR-1, as applicable, unless satisfied that all work carried out is in accordance with this Section. The Authorized Nuclear Inspector and Authorized Nuclear Inspector Supervisor shall have access to areas where work is being performed including subcontractors facilities in order to perform their required duties. The ANI shall be involved in dispositions and verification for non-conformances and corrective actions involving quality or code requirements.	**Additional requirements regarding Owner Interface are specified in 1.6.9**
1.6.8.2 t) t) Authorized Nuclear Inspector Qualifications and duties shall be as specified in ASME QAI-1 and NB-263, RCI-1 for the Authorized Inspection Agencies, Authorized Nuclear Inspector and the Authorized Nuclear Inspector Supervisor. Additional requirements are specified in NBIC Part 3, 1.6.6.2 s), 1.6.7.2 s), and 1.6.9.	**1.6.6.2 t)** **t) Authorized Nuclear Inspector** **Measures shall be taken to reference the commissioned rules for National Board Authorized Nuclear Inspector, in accordance with NB-263, RCI-1 *Rules for Commissioned Inspectors*. The Authorized Nuclear Inspector shall hold the “N”, “I”, and “R” endorsements on his/her Commission. The “NR” Certificate Holder shall ensure that the latest documents including the Quality Assurance Manual, procedures and instructions are made available to the Authorized Nuclear Inspector. The Authorized Nuclear Inspector shall be consulted prior to the issuance of a repair/replacement plan by the “NR” Certificate Holder in order that the Authorized Nuclear Inspector may select any in-process inspection or hold points when performing repair/replacement activities. The “NR” Certificate Holder shall keep the Authorized Nuclear Inspector informed of progress of the repair/replacement activity so that inspections may be performed.** **The Authorized Nuclear Inspector shall not sign Form NR-1 or Form NVR-1, as applicable, unless** **satisfied that all work carried out is in accordance with this Section. The Authorized Nuclear Inspector and Authorized Nuclear Inspector Supervisor shall have access to areas where work is being performed including subcontractors facilities in order to perform**

Existing	Proposed
	their required duties. The ANI shall be involved in dispositions and verification for non-conformances and corrective actions involving quality or code requirements. Additional requirements regarding Owner Interface are specified in 1.6.9.

Item Number: 20-51 NBIC Location: Part 3, 9.1

General Description: Add practicable and its definition to the glossary

Subgroup: Repairs and Alterations

Task Group: Kathy Moore (PM)

Explanation of Need: This is not a commonly used term in everyday language.

Proposed Definition:

Practicable – capable of being accomplished based on technical consideration of the nature and scope of activities, design or arrangement.

Item Number: 20-54	**NBIC Location: Part 3, 3.4.4 d)**

General Description: Review and Update Part 3, 3.4.4 d)

Subgroup: Repairs and Alterations

Task Group: B. Schaefer (PM)

Explanation of Need: A change in dimension and/or contour is currently listed as an example of an alteration in Part 3, 3.4.4 d). A change in dimension may or may not be an alteration in actuality. Current wording does not allow for a change in dimension, even if it is a minor change not affecting the pressure retaining capability of the PRI, without being an alteration. This can be a burden to the industry.

EXISTING TEXT

3.4.4 EXAMPLES OF ALTERATIONS

d) A change in the dimensions or contour of a pressure-retaining item;

PROPOSED TEXT

3.4.4 EXAMPLES OF ALTERATIONS

d) A change in the dimensions or contour of a pressure-retaining item that affects the pressure retaining capabilities requiring engineering review and justification.

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PROPOSED ACTION ITEM

Item Number:	**20-55**
Submitted by:	Paul Shanks paul.shanks@onecis.com
Subject:	Examples of repairs **Explanation of Need:** By having an and between boiler and heat exchanger the tube is required to be simultaneously installed in both a boiler and a heat exchanger. This is valid for a boiler as they are heat exchanger but in the case of a pressure vessel heat exchanger they are not boilers as boil may not be happening. Therefore this example is not applicable to pressure vessel which I do not believe is the intent. **Background Information:** Per the Oxford English dictionary: and is a word used to connect words, clause or terms; or is a word used to link alternatives
NBIC Location:	NBIC Part 3, 3.3.3 f)

Current Text:	**Proposed Text:**
f) Replacement or plugging of boiler and heat exchanger tubes where welding is involved	**f) Replacement or plugging of boiler or heat exchanger tubes where welding is involved**

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.

Summary (January 12, 2021):

EPRI will author a best practice guideline document specific to the application of fitness for service (FFS) to high temperature components and relevant damage mechanisms. Similar to Supplement 8, EPRI will take the best practice guideline document and include only the essential content in a proposed Supplement (or other delivery mechanism) for consideration by Part 3. The proposed outline is being made available for comment to facilitate this exercise.

XYZ.1 Scope (to be limited to components with defects and introduce concept of ‘comprehensive FFS’)

XYZ.2 General requirements (need to emphasize ‘qualifications’ for those working to this supplement)

XYZ.3 Roles and responsibilities

XYZ.4 Execution of the fitness for service assessment (flow diagram(s))

XYZ.5 Inputs for the fitness for service assessment
- XYZ.5.1 Non-destructive examination
- XYZ.5.2 Identification of damage mechanism(s)
- XYZ.5.3 Geometry
- XYZ.5.4 Operating data
- XYZ.5.5 Material data and relationships
- XYZ.5.6 Developing a finite element model

XYZ.6 Risk-based inspection and determining inspection intervals

XYZ.7 Reporting and documentation

XYZ.8 Review and inspector checklist

XYZ.9 Follow-up inspection and actions

XYZ.10 Application of Supplement
- XYZ.10.1 Application of Supplement XYZ to Scenario 1
- XYZ.10.2 Application of Supplement XYZ to Scenario 2

Item Number: 20-61	**NBIC Location: Part 3, S8**

General Description: Revise Supplement 8

Subgroup: Repairs and Alterations

Task Group: J. Siefert (PM)

Explanation of Need: Supplement 8 has one sentence regarding filler metal size that needs to be deleted and dissimilar metal welding needs to be addressed under this Supplement.

Summary of changes (January 12, 2021):

- Minor editorial items have been fixed or clarified.
- Section S8.1 a) has been modified to reflect the incorporation of dissimilar metal welds.
- Section S8.2.2 is added to provide guidance for dissimilar metal weld repairs
- The language in S8.3 was confusing, and this has been resolved.
- Section S8.4 a) has been revised to reflect qualification for dissimilar metal weld repairs and language in S8.4 c) has been simplified.

Summary of changes (January 13, 2021):

Added minor edits in Welding Method 6 [Part 3, 2.5.3.6 c) 5)] and Welding Method 7 [Part 3, 2.5.3.7 i)] approved language for 2021 edition to remove reference to Code Cases 2733 and 2734 and to reference the UNS number for these respective filler materials that are covered by the Code Cases.

S8.1 SCOPE

a) The technical information provided in this supplement pertains to weld repair and post repair inspection of creep strength enhanced ferritic steel (CSEF) pressure retaining items. The present guidance covers P-No. 15E, Group 1, Grade 91 and dissimilar welds made to this material (e.g. P-No. 4, P-No. 5A or P-No. 8, P-No. 42, P-No. 43 or P-No. 45). This Supplement provides guidance for full penetration and partial penetration weld repairs not covered under Welding Method 6 (NBIC Part 3, 2.5.3.6) or Welding Method 7 (NBIC Part 3, 2.5.3.7).

b) Creep Strength Enhanced Ferritic alloys (CSEFs) are a collection of ferritic steels whose creep strength is enhanced by the creation of a precise condition of micro-structure, specifically marten- site or bainite, which is stabilized during tempering by controlled precipitation of temper-resistant carbides, carbo-nitrides, or other stable and/or meta-stable phases. Careful consideration shall be given to pressure-retaining items that are fabricated from CSEF steels~~CSEF's~~. The behavior of these materials in low temperature (i.e. fracture toughness and/or fatigue) and in high temperature (i.e. creep and/or creep-fatigue) components can be degraded by not adhering to the welding procedures and/or improper application of post-weld heat treatment (PWHT). Experienced inspection personnel should oversee weld repairs of this nature for strict compliance with all welding procedure and repair requirements.

c) Post construction access and in-service operation may not allow the practicable application of PWHT following original construction fabrication requirements and repair weld joint design. This supplement provides guidelines for weld repair options and post repair inspection using a well-engineered approach for CSEF steels. The user is cautioned to seek technical guidance for welding and selection of heat treating requirements.

d) Prior to using this guideline an engineering evaluation shall be performed to determine the scope of the repair and impact to safety prior to returning the pressure-retaining item to service for a specified period of time, based on acceptance by the Inspector, and when required the Jurisdiction. The organization performing the engineering evaluation shall have demonstrated experience with Grade 91 CSEF steels.

S8.2 WELD REPAIR OF GRADE 91 STEEL

S8.2.1 WELD REPAIR OPTIONS

a) 9Cr-1Mo-VNbN Filler Metal (i.e. matching to Grade 91) + Controlled Fill + Low PWHT (Minimum temperature is 1250°F, 675°C). Acceptable filler materials are referenced in Table S8.2.1. The minimum time and maximum heat treatment temperature shall be in accordance with the original code of construction. For reference, where the Ni+Mn content of the filler metal is not known, the maximum PWHT temperature shall be 1425°F (775°C). This maximum shall be

enforced to avoid over-tempering or exceeding the absolute maximum PWHT temperature. PWHT hold times at temperature shall be as follows:

1) Minimum holding time at PWHT temperature is specified as 1 hour per 1.0 inch (25 mm) of thickness, 30 minute minimum provided the component < 0.5 inches (12.5 mm) in thickness;

2) Minimum holding time at PWHT temperature is specified as 5 hours plus 15 minutes for each additional 1.0 inch (25 mm) over 5.0 inches (125 mm);

b) 9Cr-1Mo Filler Metal + Controlled Fill and No PWHT. Acceptable filler materials are detailed in Table S8.2.1~~S11.2.1~~.

c) Ni-base Filler Metal + Controlled Fill and No PWHT. Acceptable nickel base consumables include selected ASME F No. 43 filler metals as detailed in Table S8.2.1.

TABLE S8.2.1

ALTERNATIVE WELD REPAIR METHODS, FILLER METALS AND WELDING PROCESSES FOR GRADE 91 STEEL.

Acceptable Weld Repair Method		Welding Process and Filler Metal AWS Classification
Filler Metal	**Welding Procedure**	
Matching (9Cr-1Mo-VNbN)	Controlled Fill + Low PWHT	• SMAW – E9015-B9, E9016-B9, E9018-B9 or E9015-B91A, E9016-B91A or E9018-B91A • FCAW – E91T1-B9 or E91T1-B91A • GTAW – ER90S-B9 or ER90S-B91A
9Cr-1Mo	Controlled Fill	• SMAW – E8015-B8, E8016-B8 or E8018-B8 • FCAW – E81T1-B8 • GTAW – ER80S-B8
Ni-base	Controlled Fill	• SMAW – EPRI P87[B], ENiCrFe-2, ENiCrFe-3 • FCAW – None available • GTAW – EPRI P87[C], ERNiCr-3

[A] –B91 AWS classification is pending for the various Grade 91 filler metal product forms (currently –B9)

[B] Incorporated by ASME B&PV Code as Code Case 2734 for classification as an F No. 43 filler material

[C] Incorporated by ASME B&PV Code as Code Case 2733 for classification as an F No. 43 filler material

S8.2.2 WELD REPAIR OPTIONS FOR DISSIMILAR METAL WELDS

a) For repairs in P-No. 15E, Group 1, Grade 91, CSEF steel joined to either P-No. 8, P-No. 42, P-No. 43, or P-No. 45, as permitted for welded construction by the applicable rules of the original code of construction, the filler metal shall be limited to an austenitic, nickel-base filler metal having a designation F-No. 43 and limited

to the following consumables: ERNiCr-3, ENiCrFe-3, ENiCrFe-2, UNS N08087. This weld repair option does not require PWHT.

b) For repairs in P-No. 15E, Group 1, Grade 91, CSEF steel joined to P-No. 4, Group 1, or P-No. 5A, Group 1, the filler metal shall be limited to:

1) A martensitic, iron-base filler metal having a designation F-No. 4 or F-No. 6 and limited to the following consumables: E8015-B8, E8018-B8 or ER80S-B8. This weld repair option does not require PWHT. Or

2) A martensitic, iron-base filler metal having a designation F-No. 4 or F-No. 6 and limited to the following consumables: E9015-B9, E9016-B9, E9018-B9, E9015-B91, E9016-B91, E9018-B91, E91T1-B9, E91T1-B91, ER90S-B9 or ER90S-B91. This weld repair option requires PWHT at a minimum temperature of 1250°F (675°C).

S8.3 APPLICATION OF CONTROLLED FILL WELDING PROCEDURE

a) The minimum preheat for the repair procedure shall be 300°F (150°C). The preheat temperature shall be checked to ensure the minimum preheat temperature is maintained during all welding and until welding is completed. The maximum interpass temperature shall be 550°F (290°C). At the completion of welding, a post weld hydrogen bake-out is not required nor prohibited.

b) To control heat input the weld repair shall be performed using a “controlled fill” technique. In this technique, the first layer in contact with the repair groove can be identical or smaller in diameter than the fill passes.

c) Figures S8.3-a through S8.3-d illustrate the types of acceptable weld joint details using the controlled fill technique for full or partial penetration weld repairs.

d) The bead-to-bead overlap should be ~50% or greater. The fill passes should be deposited working from the bevel of the machined excavation towards the center of the excavation with a minimum overlap of 25% and ideally 50%. As a rule of thumb, if the welder aims for the toe of the previously deposited weld bead, an overlap of at least 40% will be achieved.

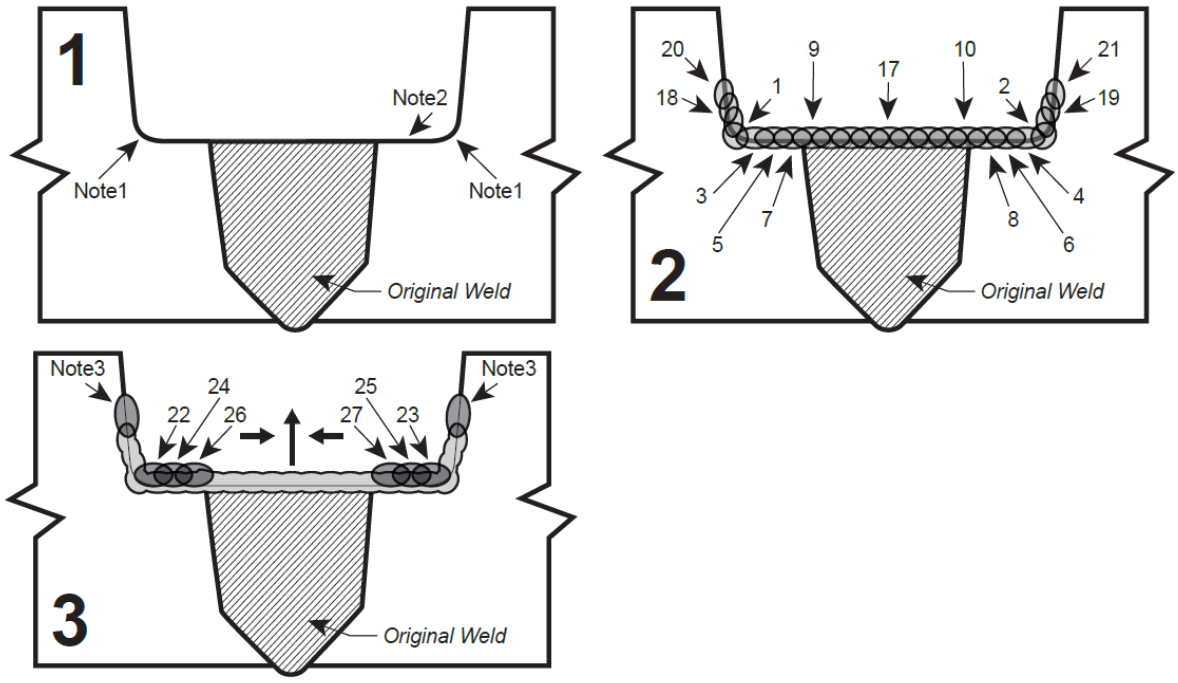
e) When the SMAW process is specified, the fill passes in immediate contact with the excavation shall not exceed an electrode diameter of 1/8 in. (3.2 mm). The remaining fill passes shall not exceed an electrode diameter of 5/32 in. (4.0 mm). When the GTAW process is specified, any limits for filler metal size shall be reflected in the qualified PQR and WPS.

~~When the SMAW process is specified using ferrous filler metals for an initial fill pass layer as a controlled fill welding technique, the electrode diameter is restricted to a maximum size of 1/8 in. (3.2 mm). The remaining fill passes to complete this excavation using this technique and SMAW process are limited to an electrode diameter of 5/32 in. (4.0 mm). When the SMAW process is~~

~~specified with ferrous filler metals, the fill passes are restricted to a maximum electrode diameter of 1/8 in. (3.2 mm). When the SMAW process is specified with nickel-base filler metals, the fill passes in immediate contact with the excavation shall not exceed an electrode diameter of 1/8 in. (3.2 mm), and for the remaining fill passes to restore the excavated material an increase in the electrode diameter to 5/32 in. (4.0 mm) is permitted. When the GTAW process is specified, any limits for filler metal size shall be reflected in the qualified PQR and WPS.~~

FIGURE S8.3-a.

SCHEMATIC OF THE CONTROLLED FILL WELDING PROCEDURE FOR GRADE 91 STEEL FOR A PARTIAL PENETRATION WELD REPAIR.



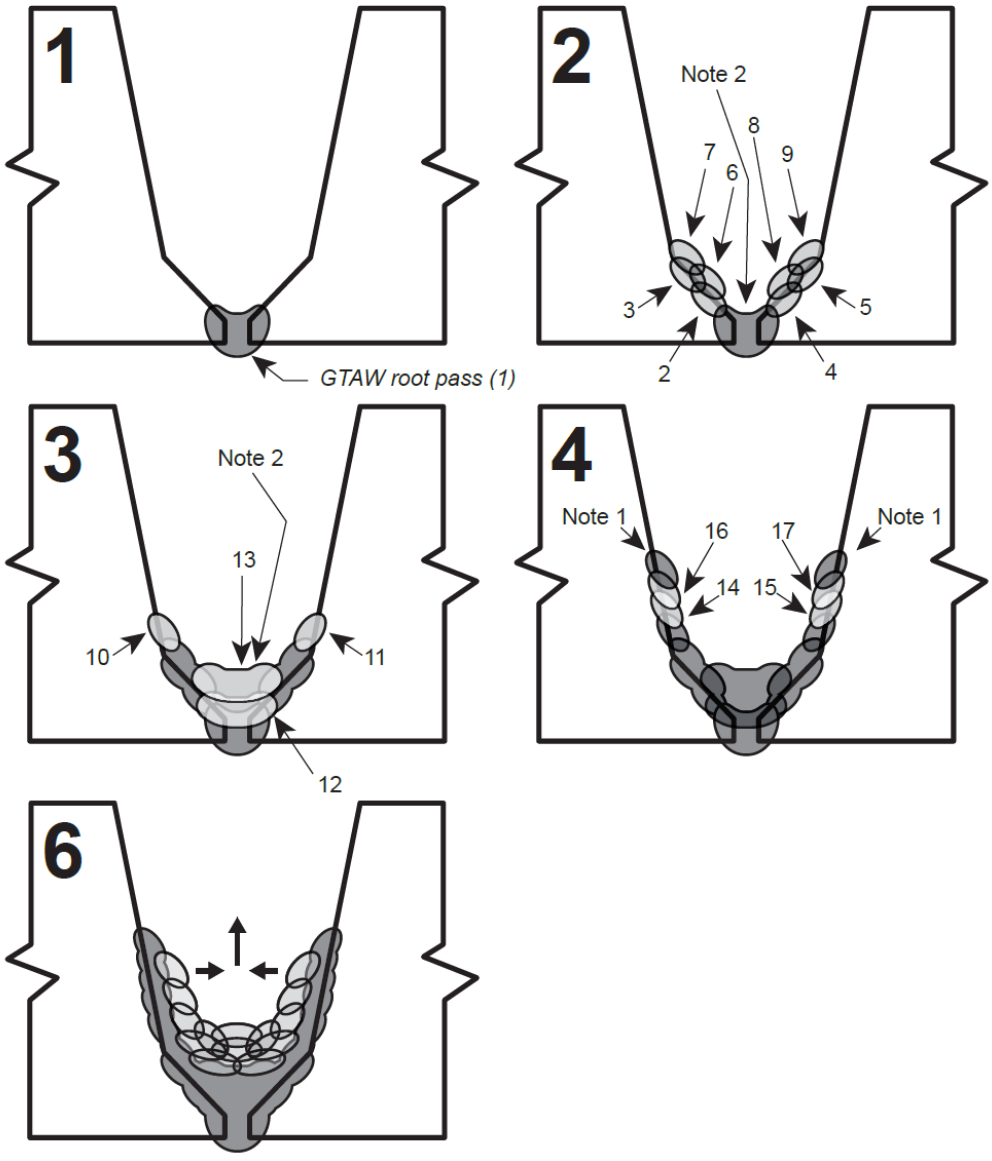
Note 1 – The excavation shall have rounded corners to prevent lack of fusion defects. In these locations it is recommended to use a smaller diameter electrode (such as 3/32 in. (2.4 mm)) to ensure acceptable fusion.

Note 2 – The repair cavity width shall extend at least 0.40 in. (10 mm) beyond the fusion line of the original weld

Note 3 – Where the excavation may pose challenges with electrode access, it is recommended that the fill passes in immediate contact with the machined excavation be restricted in height as the weld repair is performed.

FIGURE S8.3-b.

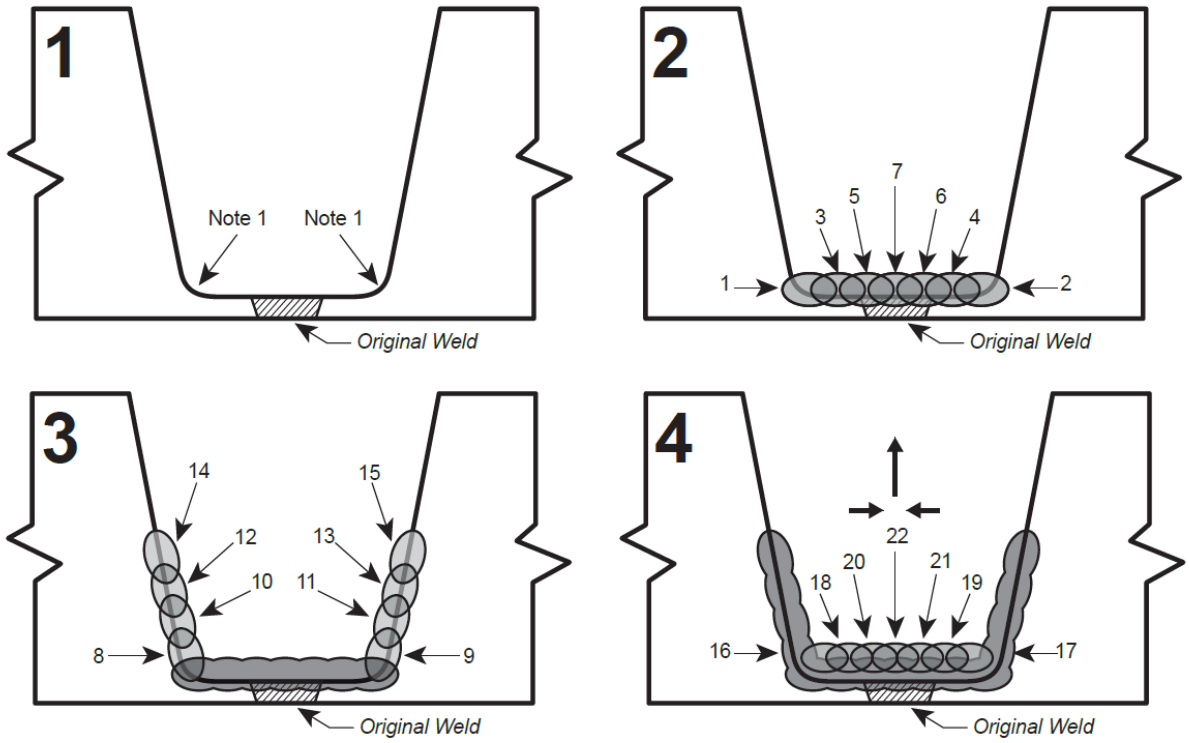
SCHEMATIC OF THE CONTROLLED FILL WELDING PROCEDURE FOR GRADE 91 STEEL FOR A FULL PENETRATION WELD REPAIR USING A COMPOUND BEVEL.



Note 1 – Where the excavation may pose challenges with electrode access, it is recommended that the fill passes in immediate contact with the machined excavation be restricted in height as the weld repair is performed.

FIGURE S8.3-c.

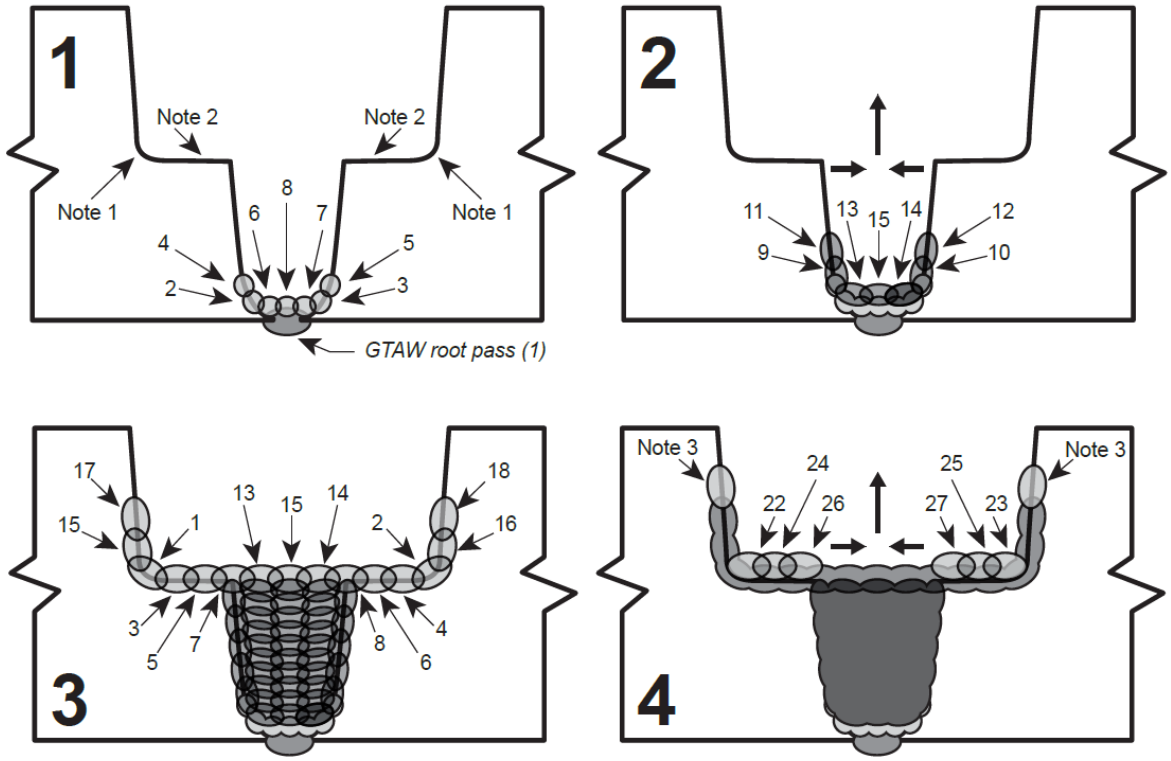
SCHEMATIC OF THE CONTROLLED FILL WELDING PROCEDURE FOR GRADE 91 STEEL FOR FULL PENETRATION WELD REPAIR USING A LAND.



Note 1 – The excavation shall have rounded corners to prevent lack of fusion defects. In these locations it is recommended to use a smaller diameter electrode (such as 3/32 in.(2.4 mm)) to ensure acceptable fusion.

FIGURE S8.3-d.

SCHEMATIC OF THE CONTROLLED FILL WELDING PROCEDURE FOR GRADE 91 STEEL FOR A FULL PENETRATION WELD REPAIR USING A STEP WELD PREPARATION.



Note 1 – The excavation shall have rounded corners to prevent lack of fusion defects. In these locations it is recommended to use a smaller diameter electrode (such as 3/32 in.(2.4 mm)) to ensure acceptable fusion.

Note 2 – The repair cavity width shall extend at least 0.40 in. (10 mm) beyond the fusion line of the original weld

Note 3 – Where the excavation may pose challenges with electrode access, it is recommended that the fill passes in immediate contact with the machined excavation be restricted in height as the weld repair is performed.

S8.4 QUALIFICATION OF CONTROLLED FILL WELDING PROCEDURE

a) The welding procedure qualification test coupon shall be ASME P-No. 15 E, Group 1, joined to itself, or P-No. 4 or P-No. 5A or P-No. 8, P-No. 42, P-No. 43, or P-No. 45. ~~The test material for the welding procedure qualification shall be P-No 15E, Group 1, Grade 91.~~

b) Qualification thickness for the test plates and repair groove depths shall be in accordance with ASME Section IX.

c) The Welding Procedure Specification (WPS) shall be qualified in accordance with requirements of ASME Section IX. ~~If qualifying the WPS with PWHT, the PWHT is to be low temperature PWHT, i.e., a minimum temperature of 1250°F (675°C) and a maximum temperature of 1445°F (785°C).~~

d) For qualification of weld repair procedures using 9Cr-1Mo filler metal and in the as-welded condition, the requirements for the bend test shall be performed using a bend radius which achieves a minimum of 14% elongation in the outer fibers.

S8.5 POST REPAIR INSPECTION

a) 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.

b) Post-repair inspection intervals and methods of examination shall be implemented to ensure safe operation and margin to locate and monitor defect growth in the weld repair area. The selected non-destructive examination method shall provide meaningful results and shall follow NBIC Part 3, Section 4.

c) Post repair inspection shall be on-going until the component reaches end of life or is replaced. The Owner/User may revise the re-inspection interval based on inspection results from previous inspections.

Part 3, 2.5.3.6 c) 5)

d. The filler metal shall be limited to an austenitic, nickel-base filler metal having a designation F-No. 43 to those assigned to F-number 43 in Section IX, QW-432 and limited to the following consumables: ERNiCr-3, ENiCrFe-3, ENiCrFe-2, UNS N08087; or ~~ASME B&PV Code Cases 2733 and 2734 (e.g. EPRI P87); or~~

Part 3, 2.5.3.7 i)

5) For the joining of ASME P-No. 15E, Group 1 to P-No. 8, P-No. 42, P-No. 43 or P-No. 45, the filler metal shall be limited to an austenitic, nickel-base filler metal to those assigned to F-No. 43 in ASME Section IX, QW-432 and limited to the following consumables: ERNiCr-3, ENiCrFe-3, ENiCrFe-2, UNS N08087.~~ASME B&PV Code Cases 2733 and 2734.~~

NBIC Part 3 Inquiry

Robert Underwood
Hartford Steam Boiler
10/30/2020

Item No.	**20-73 –** Pressure testing of connecting welds
Purpose	Revise 4.4.2(a)(1) and (2) to clarify the term replacement part
Statement of Need:	To clarify that "replacement part" as specified in 4.4.2(a)(1) and (2) is referring to those parts fabricated by welding as described in 3.3.2(c) and (d).
Background Information:	We have had some inquiries from repair firms and Repair Inspectors who are confused by the term "replacement part" as it is used in paragraphs 4.4.2(a)(1) and (2). I believe that "replacement part" in 4.4.2(a)(1) and (2) refers to those parts fabricated by welding as described in 3.3.2(c) and (d), and not those as described in 3.3.2(a) and (b). This proposal would clarify that alternative pressure testing of connecting welds of "replacement parts" is referring to replacement parts fabricated by welding such as economizers, superheaters, etc... and not material such as nozzles and piping.
Existing Text:	**4.4.2(a)(1 and 2) From 2021 Edition** a) Liquid Pressure Test Pressure testing of alterations shall meet the following requirements: 1) A pressure test as required by the original code of construction shall be conducted. The test pressure shall not exceed the maximum hydrostatic test pressure of the original code of construction. When the original test pressure included consideration of corrosion allowance, the test pressure may be further adjusted based on the remaining corrosion allowance. The pressure test for replacement parts may be performed at the point of manufacture or point of installation. 2) As an alternative to pressure testing connecting welds in accordance with the original code of construction, connecting welds may be tested or examined in accordance with the rules for repairs (see NBIC Part 3, 4.4.1). Connecting welds are defined as welds attaching the replacement part to the pressure-retaining item;
Proposed Text:	**4.4.2(a)(1) and (2) (From 2021 Edition)**

	a) Liquid Pressure Test Pressure testing of alterations shall meet the following requirements: 1) A pressure test as required by the original code of construction shall be conducted. The test pressure shall not exceed the maximum hydrostatic test pressure of the original code of construction. When the original test pressure included consideration of corrosion allowance, the test pressure may be further adjusted based on the remaining corrosion allowance. The pressure test for replacement parts ~~fabricated by welding~~addressed in NBIC Part 3, 3.2.2 c) or d) may be performed at the point of manufacture or point of installation. 2) As an alternative to pressure testing connecting welds in accordance with ~~the original code of construction,~~ NBIC Part 3, 4.4.2~~(~~a)~~(~~1)~~ above,~~ connecting welds may be tested or examined in accordance with the rules for repairs (see NBIC Part 3, 4.4.1). Connecting welds are defined as welds attaching ~~the~~ a replacement part ~~fabricated by welding~~addressed in NBIC Part 3, 3.2.2 c) or d) to the pressure-retaining item;

3.2.2 REPLACEMENT PARTS

Replacement parts to be used in repairs or alterations shall meet the following applicable requirements:

a) Replacement parts that will be subject to internal or external pressure that consist of new materials which should be formed to the required shape by casting, spinning, forging, die forming, and on which no fabrication welding is performed, shall be supplied as material. Such parts shall be marked with the material and part identification and the name or trademark of the parts manufacturer. In lieu of full identification marking on the material or part, the part manufacturer may use a coded marking system traceable to the original marking. Such markings shall be considered as the parts manufacturer's certification that the part complies with the original code of construction. Examples include seamless or welded tubes or pipe, forged nozzles, heads or tubesheets, or subassemblies attached together mechanically;

b) Replacement parts that will be subject to internal or external pressure that are preassembled by attachment welds shall have the welding performed in accordance with the original code of construction. The supplier or manufacturer shall certify that the material and fabrication are in accordance with the original code of construction. This certification shall be supplied in the form of bills of material and drawings with statement of certification. Examples include boiler furnace wall or floor panel assemblies, prefabricated openings in boiler furnace walls, such as burner openings, air ports, inspection openings, or sootblower openings;

c) When ASME Code is the original code of construction, replacement parts subject to internal or external pressure fabricated by welding, which require inspection by an Authorized Inspector shall be fabricated by an organization having an appropriate ASME *Certificate of Authorization*. The item shall be inspected and stamped as required by the applicable section of the ASME Code. A completed ASME *Manufacturer's Partial Data Report* shall be supplied by the manufacturer.

1) ASME stamping and completion of an ASME Manufacturer's Partial Data Report is not required for parts fabricated by the "R" Certificate Holder that will be used on pressure retaining items being repaired or altered by the same "R" Certificate Holder. The controls for this activity shall be described in the quality control system.

2) The "R" Certificate Holder, using replacement parts fabricated and certified to an ASME Code edition and addenda different from that used for the original construction, shall consider and seek technical advice, where appropriate, for change or conflicts in design, materials, welding, heat treatment, examinations and tests to ensure a safe repair/alteration is performed. Note that work once classified as a repair could now be considered an alteration.

d) When the original code of construction is other than ASME Code, replacement parts subject to internal or external pressure, fabricated by welding, shall be manufactured by an organization certified as required by the original code of construction. The item shall be inspected and stamped as required by the original code of construction. Certification to the original code of construction, as required by the original code of construction or equivalent, shall be supplied with the item. When this is not possible or practicable, the organization fabricating the part shall have a National Board "R" *Certificate of Authorization*; replacement parts shall be documented on Form R-3 and the "R" Symbol Stamp applied as described in NBIC Part 3, Section 5.

NBIC Part 3 Inquiry

Scott Chestnut
01/10/2021

Purpose	**ITEM 20-75** Remove bad reference in 2.5.3.2(h) relating to charpy impact testing temperature
Statement of Need:	To revise 2.5.3.2(h) to provide the correct charpy impact test temperature
Background Information:	Current text in 2.5.3.2 h) requires Charpy impact tests be conducted "at the temperature determined in accordance with NBIC Part 3, 2.5.3.2 d)." 2.5.3.2 d) only discusses WPS preheat and interpass temperature. It does not discuss the temperature at which to conduct CVN testing. There is no reference made to the MDMT.
Existing Text:	**Part 3, 2.5.3.2** h) Notch toughness shall be determined and evaluated by Charpy impact tests in accordance with the provisions of the original code of construction at the temperature determined in accordance with NBIC Part 3, 2.5.3.2 d). Exemptions from impact testing described in the original code of construction are not applicable;
Proposed Text:	**Part 3, 2.5.3.2** h) Notch toughness shall be determined and evaluated by Charpy impact tests in accordance with the provisions of the original code of construction. ~~at the a temperature determined in accordance with NBIC Part 3, 2.5.3.2 d) not warmer than the minimumm design metal temperature~~. Exemptions from impact testing described in the original code of construction are not applicable;

2.5.3(d) Existing test does not reference charpy impact test temperature

d) The detailed welding methods listed in the following subsections may be used as an alternative to post-weld heat treatment (PWHT). NBIC Part 3, 2.5.3.1 is a method in which the welding procedure requires an elevation of the preheat temperature. In contrast, NBIC Part 3, 2.5.3.2 through 2.5.3.5, are methods in which the welding procedure requires the use of a temper-bead welding technique. Welding Method 6 as described in 2.5.3.6 requires use of a controlled fill technique. In 2.5.3.5 is a method in which the welding procedure used for joining dissimilar materials requires either an elevation of the preheat temperature or a temper-bead welding technique, depending on the chemical composition of the base metal that is joined to an austenitic steel. Temper-bead welding procedure nomenclature is defined in Section IX of the *ASME Boiler and Pressure Vessel Code*. Typically, this technique minimizes heat input of the initial beads, thus limiting heat beyond the weld heat-affected zone (HAZ) of the base metal. Heat input shall be increased for successive beads in accordance with the rules of QW-290 for temper bead welding in ASME Section IX. The Welding Procedure and Welder Performance Qualifications shall, in all cases, be in accordance with the requirements of the latest Edition of Section IX of the *ASME Boiler and Pressure Vessel Code*.

Action Item 20-76: Request for the addition to NBIC Part 3, Glossary

Rick Valdez
ARB, INC.
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661 331 6024

Background:	With the use of indirect inspection equipment from borescopes to tethered drones/vehicles for confined space inspections, there is a need to clarify what is considered a "remote" inspection vs an "indirect" inspection.
Explanation of need:	Remote Inspections need to be better clarified.
Date opened	9/15/2020
Proposed:	Remote Visual Examination: a visual examination technique used with visual aids for conditions where the area to be examined is inaccessible for direct visual examination.

NBIC Part 3 Inquiry

Robert Underwood
Hartford Steam Boiler
12/15/20

Purpose	Revise 4.4.2(a)(2) to clarify the term replacement part
Statement of Need:	To clarify that the minimum test pressure for alterations shall be in accordance with the original code of construction.
Background Information:	I have recently had discussions with some repair firms and Repair Inspectors who believe there are no minimum test pressure requirements when performing a liquid pressure tests of alterations since it is not specifically stated in paragraph 4.4.2(a)(1). This proposal would revise the second sentence of 4.4.2(a)(1) to specifically address minimum test pressure requirements for alterations.
Existing Text:	**4.4.2(a)(1) (From 2021 Edition)** a) Liquid Pressure Test Pressure testing of alterations shall meet the following requirements: 1) A pressure test as required by the original code of construction shall be conducted. The test pressure shall not exceed the maximum liquid test pressure of the original code of construction. When the original test pressure consideration of corrosion allowance, the test pressure may be further adjusted based on the remaining corrosion allowance. The pressure test for replacement parts may be performed at the point of manufacture or point of installation.
Proposed Text:	**4.4.2(a)(1) (From 2021 Edition)** a) Liquid Pressure Test Pressure testing of alterations shall meet the following requirements: 1) A pressure test as required by the original code of construction shall be conducted. The test pressure shall not be less than the minimum or exceed the maximum liquid test pressure of the original code of construction. When the original test pressure included consideration of corrosion allowance, the test pressure may be further adjusted based on the remaining corrosion allowance. The pressure test for replacement parts may be performed at the point of manufacture or point of installation.

PROPOSED ACTION ITEM

Item Number:	**20-83**
Submitted by:	Terry Hellman thellman@nationalboard.org
Subject:	Definition of Nonconformance **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. **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.
NBIC Location:	NBIC Part 3, 1.5.1 s) and 9.1

Current Text:	**Proposed Text:**
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.	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. **9.1 Glossary** 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.

Such stamping or attaching of a nameplate shall be done only with the knowledge and authorization of the Inspector and Competent Authority. The "R" Certificate Holder responsible for the repair or the construction portion of the modification/alteration shall apply the stamping. For a re-rating where no physical changes are made to the pressure-retaining item, the "R" Certificate Holder responsible for the design shall apply the stamping. Requirements for stamping and nameplate information are shown in NBIC Part 3, Section 5.

~~**S6.15.1 SPECIFIC "R" STAMPING AND NAMEPLATE REQUIREMENTS**~~

~~The holder of a "R" *Certiicate of Authorization* is required to affix a stamping or nameplate on the Transport Tank that indicates, the repair, alteration, or modification has been performed in accordance with the requirements of NBIC Part 3, Supplement 6 and the additional requirements of the code of construction. All repairs, alterations, and modifications, after acceptance by the Registered Inspector, shall have the "R" Symbol affixed to the stamping or the nameplate. The stamping or nameplate information shall satisfy the requirements of a) thru g) below:~~

~~a) The required data shall be in characters at least 4 mm (5/32 in.) high;~~

~~b) The markings may be produced by casting, etching, embossing, debossing, stamping, or engraving;~~

~~c) The selected method shall not result in any harmful contamination or sharp discontinuities to the pressure- retaining boundary of the Transport Tank;~~

~~d) Stamping directly on the Transport Tank, when used, shall be done with blunt nose continuous or blunt nose interrupted dot die stamps. If direct stamping would be detrimental to the item, required markings and the embossed Code Symbol stamping may appear on a nameplate affixed to the Transport Tank;~~

~~e) The "R" Certificate Holder shall use its full name as shown on the *Certiicate of Authorization* or use an approved abbreviation acceptable to the National Board;~~

~~f) The non-embossed Code Symbol stamping, when directly applied on the item or when a nameplate is used shall be applied adjacent to the original manufacturer's stamping or nameplate. A single repair stamping or nameplate may be used for additional activities performed, provided the repair activity is carried out by the same "R" Certificate Holder;~~

~~g) The date of each repair, alteration, or modification corresponding with the date on the applicable "R" form shall be applied to the exiting stamping or nameplate.~~

S6.15.~~2~~1 REMOVAL OF ORIGINAL STAMPING OR NAMEPLATE

If it becomes necessary to remove the original stamping, the Inspector shall, subject to the approval of the Competent Authority, witness the making of a facsimile of the stamping, the obliteration of the old stamping, and the transfer of the stamping. When the stamping is on a nameplate, the Inspector shall witness the transfer of the nameplate to the new location. Any relocation shall be described on the applicable NBIC "R" Form. The restamping or replacement of a code symbol stamp shall be performed only as permitted by the governing code of construction.

S6.16 "R" FORMS

S6.16.1 DOCUMENTATION

Repairs, alterations, or modifications that have been performed in accordance with the NBIC shall be documented on Form R-1, *Report of Repair* or Form R-2, *Report of Alteration* as shown in NBIC Part 3, Section 5. Form R-4, *Report Supplementary Sheet*, shall be used to record additional data when space is insufficient on Form R-1 or R-2.

ITEM 21-11

(19) **2.2.5 QUALIFIED PERSONNEL IDENTIFICATION**

The "R" Certificate Holder shall establish a system for the assignment of a unique identification mark to each person qualified in accordance with the requirements of the NBIC. The "R" Certificate Holder shall also establish a written procedure whereby production joints are identified and traceable to the person who made them. This procedure shall use one or more of the following methods and be acceptable to the Inspector.

a) The person's identification mark may be stamped (low stress stamp, if used) adjacent to production joints made by the individual; or

b) the "R" Certificate Holder may keep a documented record of production joints and the persons used in making the joints.

(19) **2.2.6 CONTINUITY OF QUALIFIED PERSONNEL**

The performance qualification of a qualified person shall be affected when one of the following conditions occur:

a) When the person has not used a specific process during a period of six months or more, their qualifications for that process shall expire; or

b) When there is specific reason to question the person's ability to make joints that meet the specification, the qualification which supports the process that is being performed shall be revoked. All other qualifications not questioned remain in effect.

(19) **2.2.6.1 PROCESS CONTINUITY RECORDS**

a) The "R" Certificate Holder shall maintain process continuity records and shall make the records available to the Inspector.

b) The method of recording process continuity and the record retention period shall be described in the "R" Certificate Holder's Quality System Manual.

c) When there is specific reason to question a person's ability to make joints that meet the specification, the qualification which supports the process that is being performed shall be revoked. All other qualifications not questioned remain in effect.

(19) **2.3 STANDARD WELDING PROCEDURE SPECIFICATIONS**

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 SWPSs. 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 conversation table 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.

~~1) Reaffirmed SWPSs: When reaffirmation occurs without revision to the SWPS, the letter R is added to the SWPS designation.~~

2)1) Amended SWPSs: When an amendment occurs the suffix "AMD1" is added to the SWPS designation. Amendments are issued when essential for the prompt correction of an error that could be misleading. Amendments are incorporated into the existing text of the SWPS, which is reprinted and clearly marked as incorporating an amendment(s), and which is identified in the revised Foreword of the amended SWPS.

3) Revised SWPSs: When a revision to a published SWPS occurs, the publication date is added to the SWPS designation. The date of the superseded SWPS is also noted on the cover page. Previous versions of the superseded SWPS may be used at the option of the R Certificate holder.

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

TABLE 2.3

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: 2009	B2.1-1/8-231: 2015
B2.1-1-017: 2018	B2.1-1-204: 2019	B2.1-4-218: 2009	B2.1-1-232: 2020
B2.1-1-018: 2005	B2.1-1-205: 2019	B2.1-4-219: 2009	B2.1-1-233: 2020
B2.1-1-019: 2018	B2.1-1-206: 2019	B2.1-4-220: 2009	B2.1-1-234: 2006
B2.1-1-020: 2018	B2.1-1-207: 2019	B2.1-4-221: 2009	B2.1-1-235: 2006
B2.1-1-021: 2018	B2.1-1-208: 2019	B2.1-5A-222: 2009	
B2.1-1-022: 2018	B2.1-1-209: 2019	B2.1-5A-223: 2009	
B2.1-8-023: 2018	B2.1-1-210: 2012	B2.1-5A-224: 2009	
B2.1-8-024: 2012	B2.1-1-211: 2012	B2.1-5A-225: 2009	
B2.1-8-025: 2012	B2.1-8-212: 2012	B2.1-5A-226: 2009	
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	

CARBON STEEL — (P1 MATERIALS)

SMAW — Shielded Metal Arc Welding	
Standard Welding Procedure Specification for Shielded Metal Arc Welding of Carbon Steel, (M-1/P-1, Group 1 or 2), 3/16 in. (5 mm) through 3/4 in. (19 mm), in the As-Welded Condition, With Backing.	B2.1.001-90 and B2.1-1-001: 90(R2006)
Standard Welding Procedure Specification for Shielded Metal 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, E7018, As-Welded or PWHT Condition.	B2.1-1-016-94 and B2.1-1-016-94R
Standard Welding Procedure Specification for Shielded Metal 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, E6010, As-Welded or PWHT Condition.	B2.1-1-017-94 and B2.1-1-017-94R
Standard Welding Procedure Specification for Shielded Metal 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, E6010 (Vertical Uphill) followed by E7018, As-Welded or PWHT Condition.	B2.1-1-022-94 and B2.1-1-022-94R
Standard Welding Procedure Specification for Shielded Metal 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, E6010 (Vertical Downhill) followed by E7018, As-Welded or PWHT Condition.	B2.1-1-026-94 and B2.1-1-026-94R
Standard Welding Procedure Specification for Shielded Metal Arc Welding of Carbon Steel (M-1/P-1/S-1, Group 1 or 2), 1/8 in. (3.2 mm) through 3/4 in. (19 mm) Thick, E6010 (Vertical Uphill) followed by E7018, (Vertical Uphill) As-Welded Condition, Primarily Pipe Applications.	B2.1-1-201-96, and B2.1-1-201-96(R2007)

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NEW ITEM _____: Update Table 2.3

~~Standard Welding Procedure Specification for Shielded Metal Arc Welding of Carbon Steel (M-1/P-1/S-1, Group 1 or 2), 1/8 in. (3.2 mm) through 3/4 in. (19 mm) thick, E6010 (Vertical Downhill) followed by E7018 (Vertical Uphill), As-Welded Condition, Primarily Pipe Applications.~~	~~B2.1-1-202-96(R2007)~~
~~Standard Welding Procedure Specification for Shielded Metal Arc Welding of Carbon Steel (M-1/P-1/S-1, Group 1 or 2), 1/8 in. (3.2 mm) through 3/4 in. (19 mm) Thick, E6010 (Vertical Uphill), As-Welded Condition, Primarily Pipe Applications.~~	~~B2.1-1-203-96 and B2.1-1-203-96(R2007)~~
~~Standard Welding Procedure Specification for Shielded Metal Arc Welding of Carbon Steel (M-1/P-1/S-1, Group 1 or 2), 1/8 in. (3.2 mm) through 3/4 in. (19 mm) Thick, E6010 (Vertical downhill root with balance vertical uphill), As-Welded Condition, Primarily Pipe Applications.~~	~~B2.1-1-204-96 and B2.1-1-204-96(R2007)~~
~~Standard Welding Procedure Specification for Shielded Metal 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, E6010 (Vertical Uphill) followed by E7018 (Vertical Uphill), As-Welded or PWHT Condition, Primarily Pipe Applications.~~	~~B2.1-1-205-96 and B2.1-1-205-96(R2007)~~

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