THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

NATIONAL BOARD SUBGROUP REPAIRS AND ALTERATIONS

MINUTES

Meeting of January 12th, 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
1055 Crupper Avenue
Columbus, Ohio 43229-1183
Phone: (614)888-8320
FAX: (614)847-1828

1. **Call to Order**

   Mr. Boseo 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 need for Quorum = 12 of the 23 Members needed
   2/3 of majority of those Members present needed for Approval of proposals

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

5. **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 19-60 (incorporated Item 20-68)
      ii. Revised Item 20-16 (update **–** Intent to Close w/No Action)
      iii. Revised Item 20-68 (update – Intent to Close w/No Action)
      iv. Revised Item 20-92 (update – Potentially to be added to Item 19-60 and Close w/No Action)
      v. Added Item 21-10
      vi. Added Item 21-11
      vii. Added Item 21-12
   b. A motion was made and seconded to adopt the Agenda as revised and was Unanimously Approved.

6. **Approval of the Minutes of the July 14th, 2020 Meeting**
   There was a motion to approve the Minutes of July 14th, 2020 as published. The motion was seconded and approved.

7. **Review of Rosters (Attachment Pages 1-3)**

   a. Membership Nominations
      i. Mr. Don Kinney (Jurisdictional Authorities) is interested in becoming a member of SG R&A. Mr. Kinney was unanimously approved by the SG for membership and will be placed on the SC R&A Agenda.

   b. Membership Reappointments
      i. The following Subgroup R&A memberships were set to expire prior to the July 2021 NBIC meeting: Mr. Frank Johnson, Ms. Kathy Moore, Mr. Brian Morelock, and Mr. Tom White. All members were reappointed by the SG unanimously and will be placed on the SC R&A Agenda

8. Action Items

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

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

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), M. Winters, T. McBee

Meeting Action: Mr. M. Toth presented a **Progress Report**. Mr. Winters and Mr. McBee volunteered to be members of the Task Group.

Item Number: 19-16	NBIC Location: Part 3, 3.3.2 e)	Attachment 2

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**.

Meeting Action: T. White presented a proposal. The proposal was revised and a motion was made, seconded, and the proposal was **Unanimously Approved.**

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

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; R. Underwood

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**.

Meeting 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 also added to this Item (19-60) and will be Closed w/No Action. The PM's for these two Items (B. Underwood and T. Seime were added to this Task Group. This was a **Progress Report**

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

General Description: Threaded Inserts as Alteration 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.

Meeting Action: P. Shanks presented and discussion was held on ASME PCC-2 requirements and previous Interp 19-20 was referenced. Previous LB did not pass SG (12-6). This was a **Progress Report**

Item Number: 19-68	**NBIC Location: Part 3, 1.6**	**No Attachment**

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

Subgroup: Repairs and Alterations
Task Group: B. Wielgoszinski (PM), R. Spuhl, T. Roberts

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

Meeting Action: B. Wielgoszinski presented a **Progress Report**.

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**.

Meeting Action: R. Troutt presented that the "safety" related verbiage is to be moved to the "Forward" of the NBIC and this Item should be Closed w/No Action. The motion was unanimously approved to **Close w/No Action.**

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: Adding language to specify that interpretations of previous NBIC editions are applicable to the most current edition, as long as code requirements have not changed.

Meeting Action: K. Moore presented that this Item can be closed with no action and the NBIC Introduction can be revised to address the use of Interpretations as proposed in this Action Item. A motion was unanimously approved to **Close w/No Action.**

Item Number: 20-15	NBIC Location: Part 3, 3.3.2 & 5.7.2	Attachment 4

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 **Progress Report**.

Item Number: 20-16	NBIC Location: Part 3, 3.4.4	Attachment 5

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.

July 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.**

Meeting Action: The submitter (P. Shanks) has proposed that this can be closed with no action. The motion was unanimously approved to **Close w/No Action.**

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)

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.

Meeting Action: P. Davis presented 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: P. 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: P. Edwards presented a **Progress Report**.

New Items:

Item Number: 20-51	**NBIC Location: Part 3, 9.1**	**Attachment 6**

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.

Meeting Action: A proposal was drafted and sent to Parts 1, 2, 4 for consideration. The proposal was revised and 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)

Explanation of Need: This was created based on discussion from Item 20-47 dealing with ANIA requirements.

Meeting Action: P. 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.

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

Item Number: 20-54	NBIC Location: Part 3, 3.2.2 e)	Attachment 7

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.

Meeting Action: Mr. Schaefer presented a proposal which was revised after much discussion. The proposal was motioned, seconded, and **Unanimously Approved** as revised.

Item Number: 20-55	NBIC Location: Part 3, 3.3.3 e)	Attachment 8

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.

Meeting Action: J. Walker presented. The proposal was revised and was motioned, seconded, and **Unanimously Approved.**

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.

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

Item Number: 20-61	NBIC Location: Part 3, S8	Attachment 9

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.

Meeting Action: Mr. Siefert a proposal which was revised for Weld Method 7. The proposal was motioned, seconded, and **Unanimously Approved.**

Item Number: 20-63	NBIC Location: Part 3, 4.4.2 d)	Attachment 10

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.

Meeting Action: T. McBee presented that a Response should go to the Inquirer that this is outside the scope of the NBIC and Close the Item. The motion to **respond to the Inquirer and Close was Unanimously Approved.**

Item Number:	NBIC Location: Part 3, S6	No Attachment

General Description: Revisions to Part 3, Supplement 6

Subgroup: Repairs and Alterations

Task Group: R. Underwood (PM)

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.

Meeting 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.

Meeting Action: This proposal was added to Item 19-60 and a motion to **Closed w/No Action** was motioned, seconded, and Unanimously Approved.

Item Number: 20-73	NBIC Location: Part 3, 4.4.2 a) 2)	Attachment 11

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.

Meeting Action: Mr. Underwood presented a proposal that was revised during the meeting. The revised proposal 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.

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

Item Number: 20-75	NBIC Location: Part 3, 2.5.3.2 d) & h)	Attachment 12

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.

Meeting Action: Mr. Chestnut presented a proposal which was revised during the meeting. The revised proposal was motioned, seconded, and **Unanimously Approved.**

Item Number: 20-76	NBIC Location: Part 3, 9.1	Attachment 13

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.

Meeting Action: Mr. Valdez presented. ASME Section V definition of “Remote” and “Direct” inspection was discussed. And Mr. Valdez ultimately decided that this proposal could be revised. Mr. M. Winters volunteered to be a member of this Task Group. This was a **Progress Report.**

Item Number: 20-80	NBIC Location: Part 3, 4.4.2 a) 1)	Attachment 14

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.

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

Item Number: 20-83	NBIC Location: Part 3, 1.5.1 s) & 9.1	Attachment 15

General Description: Revision to Part 3, 3.2.2 e)

Subgroup: Repairs and Alterations

Task Group: None assigned.

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.

Meeting Action: Secretary Hellman presented and motioned for this definition to go to a Rvw and Comment Letter Ballot to all other SC for Parts 1, 2, and 4. The motion was seconded and **Unanimously Approved.**

Item Number: 20-87	NBIC Location: Part 3, S6.8	Attachment 16

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.

Meeting Action: Secretary Hellman presented that Item 20-67 is addressing changes to Supplement 6, and that this Item will be a **Progress Report** to see if Item 20-67 addresses this issue.

Item Number: 20-88	NBIC Location: Part 3, S6.15.1	Attachment 17

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

Subgroup: Repairs and Alterations

Task Group: K. Moore (PM)

Explanation of Need: Redundant paragraph should be deleted, as Stamping Requirements are already addressed in the NBIC.

Meeting Action: K. Moore presented that Item 20-67 is addressing changes to Supplement 6, and that this Item will be a Progress Report to see if Item 20-67 addresses this issue.

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."

Meeting Action: Secretary Hellman presented that this Item has been added to Item 19-60 and motioned to **Closed w/No Action.** The motion was seconded and Unanimously Approved.

Item Number: 21-10	NBIC Location: Part 3, 5.2 &5.4	Attachment 18

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).

Meeting Action: Mr. Troutt presented that Item 20-15 (Nameplates for Routine Repairs) may impact this proposal and will wait to see what action is taken for 20-15. This was a **Progress Report.**

Item Number: 21-11	NBIC Location: Part 3, 2.3	Attachment 19

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 LB.

Meeting Action: Mr. Troutt presented and the Proposal was motioned, seconded, and **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. Sieme

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

Meeting Action: Ms. Becker presented a **Progress Report**.

9. Future Meetings

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

10. Adjournment

With no other business, Chairman Boseo adjourned the meeting at 5:35 PM

Respectfully submitted,

Terrence Hellman

Terrence Hellman, SG R&A Secretary

SG R&A Attendance

Subgroup Repairs/Alterations

Last Name	First Name	Interest Category	Role	Exp. Date	More
Boseo	Brian	National Board Certificate Holders	Chair	07/30/2023	Details
Schaefer	Benjamin	National Board Certificate Holders	Vice Chair	07/30/2023	Details
Hellman	Terrence		Secretary	12/30/2099	Details
Chestnut	Scott	Users	Member	07/30/2023	Details
Davis	Paul	Manufacturers	Member	07/30/2023	Details
Hopkins	Craig	National Board Certificate Holders	Member	01/30/2023	Details
Johnson	Frank	Users	Member	01/30/2021	Details
McBee	Timothy	Authorized Inspection Agencies	Member	10/30/2022	Details
Miletti	Ray	Manufacturers	Member	08/30/2021	Details
Moore	Kathy	National Board Certificate Holders	Member	01/30/2021	Details
Morelock	Brian	Users	Member	01/30/2021	Details
Quisenberry	Michael	National Board Certificate Holders	Member	08/30/2021	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	08/30/2021	Details
Sperko	Walter	General Interest	Member	01/30/2023	Details
Sturm	Rick	Jurisdictional Authorities	Member	01/30/2023	Details
Toth	Marty	General Interest	Member	01/30/2023	Details
Troutt	Robby	Jurisdictional Authorities	Member	07/30/2023	Details
Underwood	Robert	Authorized Inspection Agencies	Member	10/30/2022	Details
Valdez	Rick	Manufacturers	Member	08/30/2023	Details
Walker	Jamie	National Board Certificate Holders	Member	08/30/2021	Details
White	Tom	Users	Member	01/30/2021	Details

Participants (34)

Find a participant

- TH Terrence Hellman (Host, me)
- SG R&A Meeting Room
- DK Don Kinney (V)
- CH Craig Hopkins - M
- GR Gurunathan R (V)
- KM Kathy Moore(M)
- M- M - Ben Schaefer
- M - Bob Underwood
- M- M - Jamie Walker
- M- M - John Siefert, EPRI
- M- M - Paul Davis
- M- M - Scott Chestnut
- M- M - Tim McBee ARISE
- M- M - Trevor
- M- M - TWhite
- MR M Rick Valdez
- MW M Walter Sperko
- MM M-Brian Morelock
- M- Member - Paul Shanks, The OneCIS Insurance Company
- MC Mike Carlson (V)
- RM Ray Miletti - M
- RT Rob Troutt-M
- V- V - George Galanes /DTS Inc
- V- V - Julius
- V- V - Pat Becker - B&W
- V- V - Paul Edwards
- V- V - Steve Frazier
- V -Robert Wielgoszinski
- V- Visitor - Aziz Khssassi
- VS V-VISHAL SANGHAVI
- 17245197101
- G GM4
- JS Jim Sekely
- TR TCC Room Monitor

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~~g~~ 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~~ approval~~e~~ of the Quality System including review of code editions, standards, and jurisdictional requirements.

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

f) 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.

ITEM 20-15

3.3.2 ROUTINE REPAIRS

a) Routine repairs are repairs for which the requirements for in-process involvement by the Inspector ~~and stamping by the "R" Certificate Holder~~ may be waived as determined appropriate by the Jurisdiction and the Inspector. All other applicable requirements of this code shall be met. Prior to performing routine repairs, the "R" Certificate Holder should determine that routine repairs are acceptable to their Repair Inspector and the Jurisdiction, ~~-~~where the pressure-retaining item is installed;

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b) The Inspector, with the knowledge and understanding of jurisdictional requirements, shall be responsible for meeting jurisdictional requirements and the requirements of this code;

c) The "R" Certificate Holder's Quality System Program shall describe the process for identifying, controlling, and implementing routine repairs, the requirements for stamping by the "R" Certificate Holder shall be met. Routine repairs shall be documented on Form R-1 with this statement in the Remarks section: "Routine Repair". ~~: and the requirements for stamping by the "R" Certificate Holder shall be met~~

5.7.2 STAMPING REQUIREMENTS FOR REPAIRS

a) Pressure-retaining items repaired in accordance with the NBIC shall be stamped as required by this section.

b) ~~Subject to the acceptance of the Jurisdiction and the concurrence of the Inspector, nameplates and stamping may not be required for routine repairs (see NBIC Part 3, 3.3.2). In all cases, the type and extent of repairs necessary shall be considered prior to waiving the requirement.~~

c) Stamping or ~~nameplate~~ repair name-plate shall be applied adjacent to the original manufacturer's stamping or ~~repair~~ name-~~name~~plate. A single ~~repair~~repair name-~~name~~plate or stamping may be used for more than one ~~repair to~~repair to a pressure-retaining item, provided each is carried out by the same certificate holder. The date of each repair, corresponding with the date on associated Form R-1, shall be stamped on the repair name-~~name~~plate.

5.7.3 STAMPING REQUIREMENTS FOR ALTERATIONS

Pressure-retaining items altered in accordance with this code shall have a ~~name~~~~repair~~alteration name~~-~~plate or stamping applied adjacent to the original manufacturer's stamping or ~~name~~~~repair~~ name~~-~~plate in accordance with this section. For an alteration where physical changes are made to the pressure-retaining item, the "R" Certificate Holder responsible for the construction portion of the alteration shall apply the stamping or ~~name~~~~repair~~alteration name~~-~~plate. For an alteration where no physical changes are made to the pressure-retaining item (e.g., a re-rating) the "R" Certificate Holder, assuming responsibility for the design, shall apply the stamping or ~~name~~~~repair~~alteration name~~-~~plate.

5.7.4 STAMPING REQUIREMENTS FOR PARTS

Stamping or ~~name~~~~repair~~ part name~~-~~plate shall be applied in a conspicuous location on the part.

5.7.5 SPECIFIC REQUIREMENTS FOR STAMPING AND ~~NAME~~REPAIR NAME PLATES

a) Required data shall be in characters of at least 5/32 in. (4 mm) high, except that characters for pressure relief valve ~~repair name~~repair/alteration name~~-~~plates may be smaller. Markings may be produced by casting, etching, embossing, debossing, stamping, or engraving. The selected method shall not result in any harmful contamination, or sharp discontinuities to, the pressure-retaining item. See NBIC Part 3, Figures 5.7.5-a through 5.7.5-e.

b) The National Board Code Symbols ("R", "VR", and "NR") are to be stamped; do not emboss.

c) Stamping directly on items, 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 may appear on a ~~name~~repair/alteration name~~-~~plate affixed to the item.

d) The certificate holder shall use its full ~~name~~ name as shown on the *Certificate of Authorization* or an abbreviation acceptable to the National Board.

e) The letters "RP" shall be stamped below the "R" Symbol Stamp to indicate organizations accredited for performing repairs or alterations to fiber-reinforced plastic items.

f) The letter "G" shall be stamped below the "R" Symbol Stamp to indicate organizations accredited for performing repairs or alterations to graphite pressure equipment.

g) The subject ~~name~~repair/alteration name~~-~~plate shall be securely attached using a method compatible with the structure or stand-off bracket supporting the ~~name~~repair/alteration name~~-~~plate, in a manner that will impede easy removal. The method of attaching this ~~name~~repair/alteration name~~ name -~~plate, as permitted by the original code of construction, may include, but is not limited to:

1) Welding
2) Adhesive, bonding or cementing

~~2)~~

Page 235 – Liquid Petro gas
S7.7 CERTIFICATION/DOCUMENTATION AND STAMPING
a) Section 5 of this part is applicable for all post construction activities pertaining to certification/documentation
and stamping.

b) The "R" Certificate Holder shall assure all repairs or alterations involving a change to the following are recorded on the proper NBIC form and marked on the NBIC nameplate or stamping without changing the required format of the NBIC markings.

1) Service for which the container is designed (for example, underground, aboveground, or both).
2) Dip tube length.
3) Maximum filling limit with liquid temperature reference. Tamper-resistant

Page 229 - DOT
S6.15 GENERAL STAMPING REQUIREMENTS
The stamping of or attaching of a nameplate to a pressure-retaining item shall indicate that the work was performed

1) in accordance with the requirements of this code and any requirements of the Competent Authority. mechanical fasteners of suitable metal construction

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

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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" *Certificate 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 bluntnose 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 *Certificate 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.

Pg 221 – Yankee Dryers

S5.5 PROCEDURES THAT DO NOT REQUIRE STAMPING OR NAMEPLATE ATTACHMENT

All repair procedures, shall be acceptable to the Inspector, and when verified by the owner-user to not affect pressure-retaining capability of the Yankee dryer, do not require stamping or nameplate attachment.

Pg 207 – FRP

S4.14.1 STAMPING

Stamping requirements for FRP vessels are identified in NBIC Part 3, Section 5.

Pg 184 - Graphite

S3.4 ALTERATIONS

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a) The requirements provided in this section shall apply, insofar as they are applicable to the materials discussed herein. Completed alterations shall be subjected to a pressure test not less than that required by the code of construction. The test pressure shall be maintained for a minimum of 30 minutes. The pressure shall be reduced to MAWP and maintained for inspection.

b) The nameplate shall be applied in accordance with Section 5 of this part. The letter "G" shall be applied to the nameplate under the "R" stamp when graphite alterations are made. The alternate procedure defined in 5.10 may be used in lieu of the stamping and nameplate attachment requirements of NBIC Part 3, Section 5.

~~1)~~

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Item 20-16
Part 3, 3.4.4
Submitted by: Paul 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-stretched, having had repair welding. It is not clear if ASME is referring to in process (at the original manufactures location) repairs or post construction repairs. However, the NBIC is currently silent on this and this potential issue should be addressed.

Background Information: ASME Section VIII Div.1 Mandatory Appendix 44 establishes rules that allow a vessel to be designed and built for use at low temperatures using allowable stresses which are higher than would normally be allowed at 'room temperature'. The condition for doing so is that said vessels are subject to a pre-stressing operation that actually stretches the base material. The use of these higher stresses is contingent on certain design and manufacturing criteria.

Proposed Change:
3.4.4 EXAMPLES OF ALTERATIONS

a) An increase in the maximum allowable working pressure (internal or external) or temperature of a pressure- retaining item regardless of whether or not a physical change was made to the pressure-retaining item;

b) A decrease in the minimum temperature;

c) The addition of new nozzles or openings in a boiler or pressure vessel except those classified as repairs;

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

e) In a boiler, Heat Recovery Steam Generator (HRSG), or Pressure Retaining Item (PRI), an increase in the steaming capacity by means of increasing heating surface, total heat input, firing rate, adjustment, or other modification to the primary or auxiliary heat source, resulting in the steaming capacity exceeding the original Manufacturer's Minimum Required Relieving Capacity (MRRC) as described on the nameplate and or Manufacturer's Data Report (MDR);

f) The addition of a pressurized jacket to a pressure vessel;

g) Except as permitted in NBIC Part 3, 3.3.3 s); replacement of a pressure retaining part in a pressure retaining item with a material of different allowable stress or nominal composition from that used in the original design;

h) The addition of a bracket or an increase in loading on an existing bracket that affects the design of the pressure-retaining item to which it is attached;

i) The replacement of a pressure relieving device (PRD) as a result of work completed on a pressure-retaining item (PRI) that changes the resultant capacity to exceed the minimum required relieving capacity (MRRC) required by the original code of construction as described on the original Manufacturer's Data Report;

j) For plate heat exchangers, in addition to the applicable examples of alterations above, the following changes from what is listed on the MDR or described on the Original Equipment Manufacturer's (OEM)-drawing:

1) For heat transfer plates:
   a. A change in material grade or nominal thickness;
   b. A reduction in number beyond any minimum, or when no minimum is specified;
   c. An increase in number beyond any maximum, or when no maximum is specified;
   d. A change in model type;

2) Any change in material whether described at 3.3.3 s) or as described at 3.4.4 g):
   a. A change in connection bolt or frame compression bolt diameter or material grade;

k) Performing postweld heat treatment where none was originally performed on the pressure retaining item; ~~and~~

l) The installation of a welded leak box~~.~~; and

m) Welding on a vessel, marked with the cold stretching 'CS' mark, without subsequent renewed cold stretching operations witnessed by the Inspector.

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.

ITEM 20-54

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: 20-61	**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.

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.

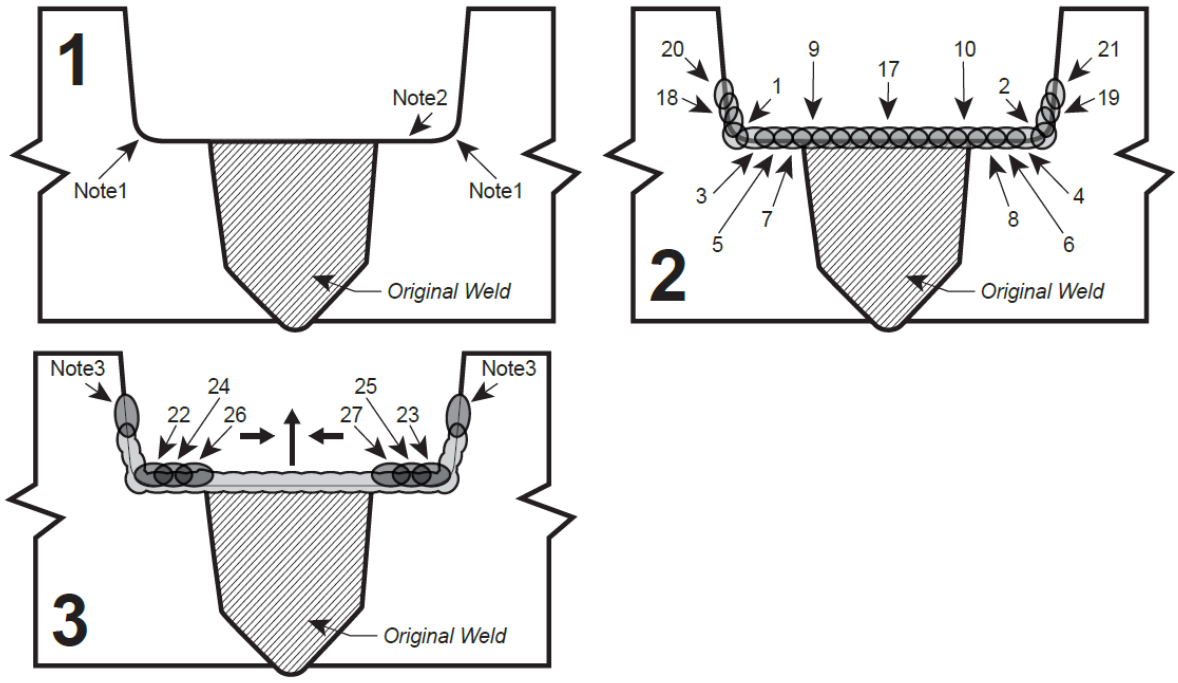
e) When the SMAW process is specified, the fill passes in immediate contact with the excavation shall not exceed an electrode diameter of 1/8 in. (3.2 mm). The remaining fill passes shall not exceed an electrode diameter of 5/32 in. (4.0 mm). When the GTAW process is specified, any limits for filler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



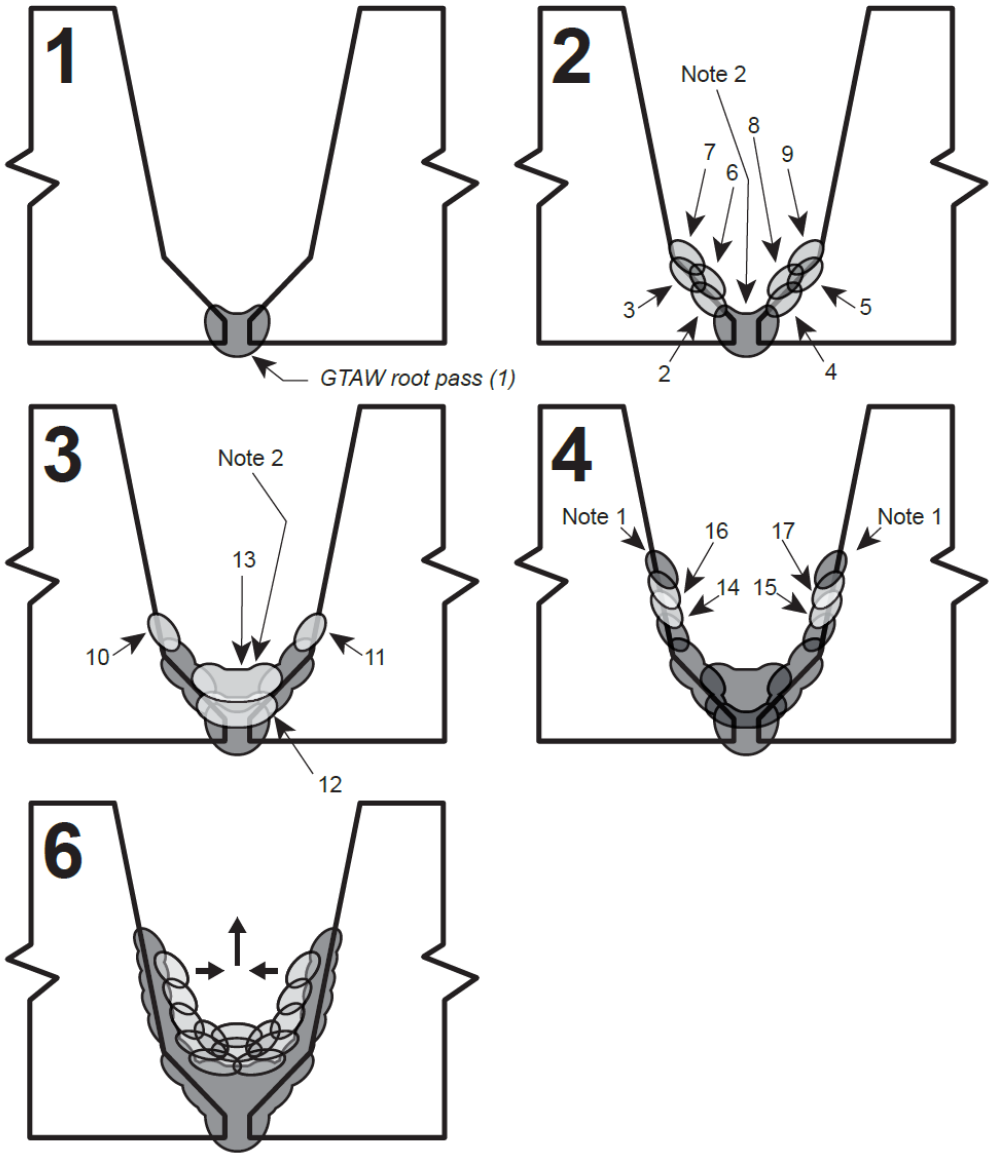
Note 1 – The excavation shall have rounded corners to prevent lack of fusion defects. In these locations it is recommended to use a smaller diameter electrode (such as 3/32 in. (2.4 mm)) to ensure acceptable fusion.

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.

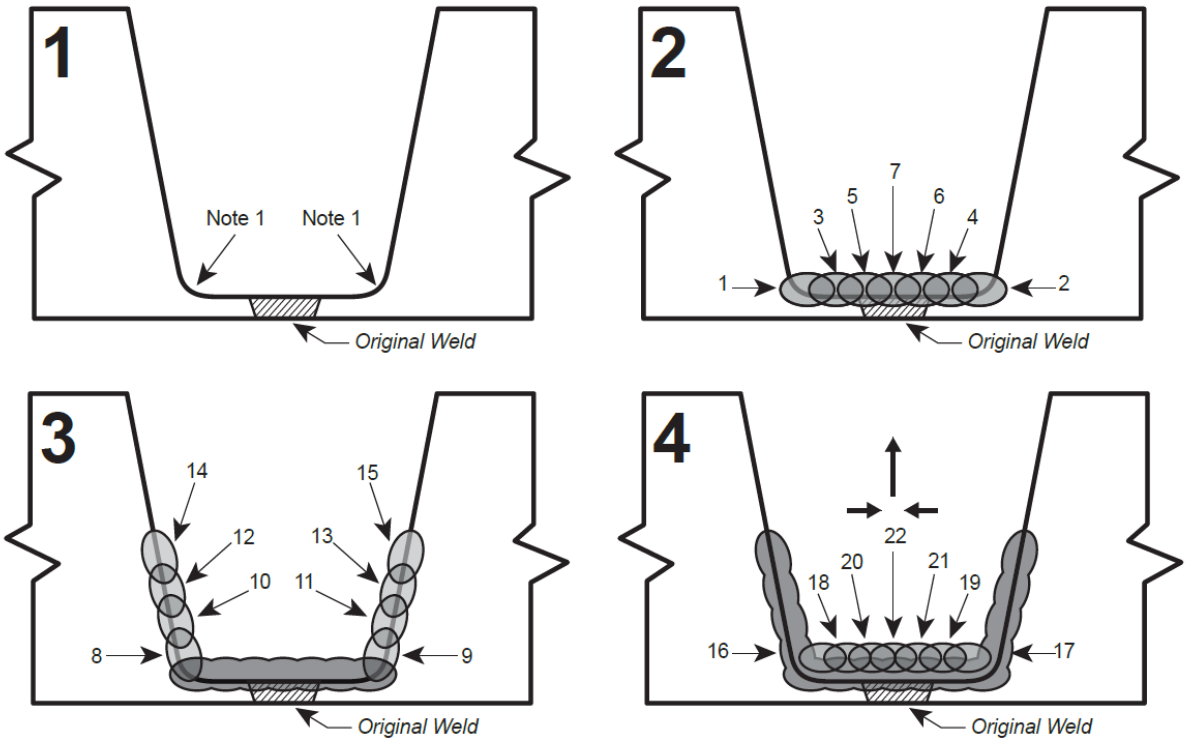
SCHEMATIC OF THE CONTROLLED FILL WELDING PROCEDURE FOR GRADE 91 STEEL FOR A FULL PENETRATION WELD REPAIR USING A COMPOUND BEVEL.



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.

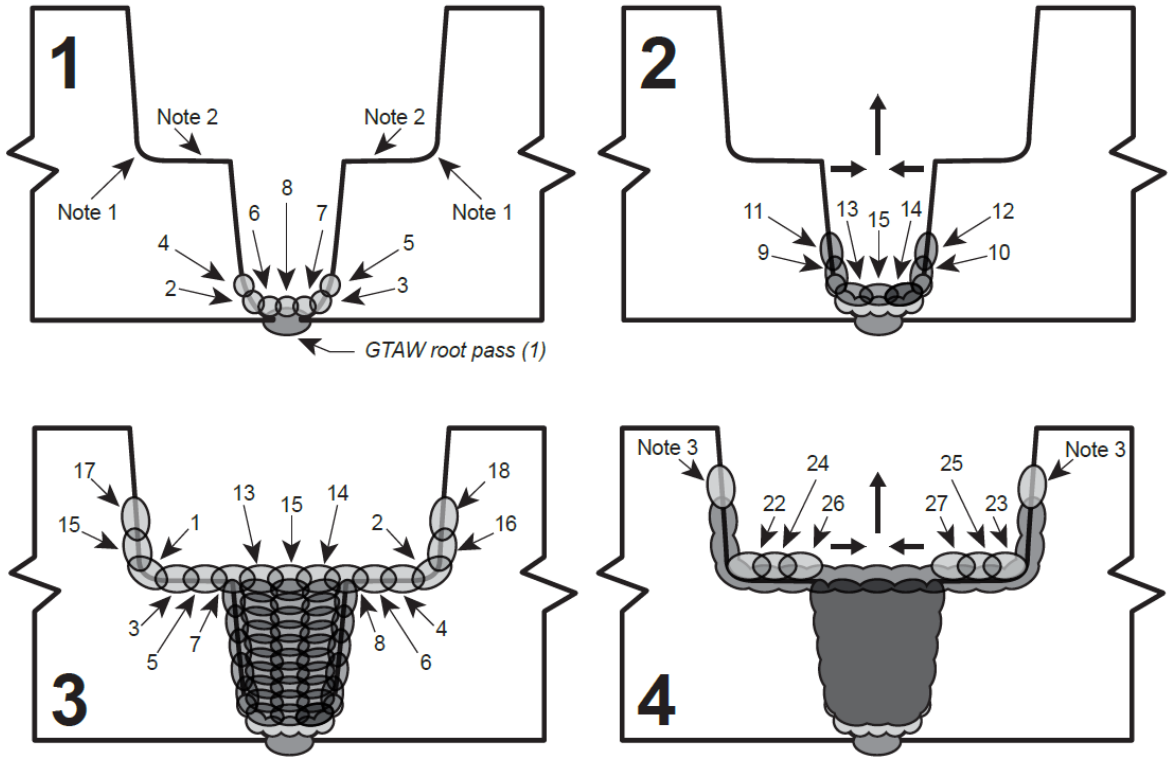
SCHEMATIC OF THE CONTROLLED FILL WELDING PROCEDURE FOR GRADE 91 STEEL FOR FULL PENETRATION WELD REPAIR USING A LAND.



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.

Item 20-63: Addition of alternative method in lieu of pressure testing

Source	Tomoaki Nakanishi 8/5/2020
Purpose	It was found that threads of tapped holes in the manway nozzle flange of the hydrocracking reactor (constructed with ASME Code Section VIII, Div. 2, 2001 Edition including 2002 Addenda) were damaged during their maintenance. Then, modification to enlarge the damaged threaded holes from 2.75 to 3.00 in. was planned as follows. 1) Enlarge size of the damaged threaded holes (from 2.75 to 3.00 in.) 2) Apply stepped studs (3.00 to 2.75 in.) for the enlarged holes with original nuts (2.75 in.)
Scope:	NBIC Part 3
Subject	**Background:** For the modification items above, the following alteration plan was proposed since contamination of pressure-retaining items by liquids is possible and pressure testing is not practicable for the huge high-pressure vessel, and NDE is not effective for the modification. 1) Evaluate strength of the nozzle with enlarged threaded holes in accordance with Part AD of ASME Code Section VIII, Div. 2, 2001 Edition including 2002 Addenda. 2) In leu of pressure testing and NDE, evaluate structural integrity of the nozzle flange with the enlarged studs, stepped studs and cover flange in accordance with Appendix 4 of ASME Code Section VIII, Div. 2, 2001 Edition including 2002 Addenda. **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.
Proposed Response:	The NBIC addresses that Alterations must be verified by test or examination per 4.4.2 unless augmented by the requirements of 3.4.1.

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.
rvaldez@prim.com
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 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.

PROPOSED ACTION ITEM

Item Number:	**20-87**
Submitted by:	Terry Hellman thellman@nationalboard.org
Subject:	Definition of Nonconformance **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. **Background Information:** Registered Inspector requirements per DOT: REGISTERED INSPECTOR EXPERIENCE Having a working knowledge of DOT specification cargo tanks is only one aspect of a Registered Inspector. When a person tests and inspects DOT specification cargo tank motor vehicles, he or she has to be trained in the HM regulations (49 CFR Parts 107-180). According to 49 CFR §180.409 any person performing or witnessing the inspections and tests must be registered, familiar with DOT-specification cargo tanks and trained and experienced in the use of equipment needed for tests and inspections, and meet the knowledge and ability requirement of the "Registered Inspector."
NBIC Location:	NBIC Part 3, S6.8

Current Text:	**Proposed Text:**
S6.8 INSPECTION Inspection and certification shall be made by an Inspector holding an appropriate National Board Commission as required by NBIC Part 3, 1.3 and shall be a Registered Inspector meeting the requirements of the Competent Authority.	S6.8 INSPECTION Inspection and certification shall be made by an Inspector holding an appropriate National Board Commission as required by NBIC Part 3, 1.3 and shall be a Registered Inspector meeting the requirements of the Competent Authority and Title 49 CFR §180.409.

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 21-10

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

5.1 SCOPE

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

(19) 5.2 DOCUMENTATION

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

b) Alterations performed in accordance with the NBIC shall be documented on a Form R-2, *Report of Alteration*, as shown in this section. A Form R-4, *Report Supplement Sheet*, shall be used as needed to record additional data when the space provided on Form R-2 is not sufficient.

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

(19) 5.2.1 PREPARATION OF FORM R-1 REPORT OF REPAIR

a) Using the instructions found at NBIC Part 3, 5.12.4.1 preparation of Form R-1 shall be the responsibility of the "R" Certificate Holder performing the repair.

b) Information describing the scope of work used to repair a pressure-retaining item (PRI) shall be documented on a Form R-1 and extended to a Form R-4 as needed to fully describe the repair activities completed per the instructions at NBIC Part 3, 5.12.4.1.

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

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

(19) 5.2.2 PREPARATION OF FORM R-2 REPORT OF ALTERATION

a) Using the instructions found at NBIC Part 3, 5.12.4.2, Initial preparation of Form R-2 shall be the responsibility of the "R" Certificate Holder responsible for the design portion of the alteration. The design organization shall complete and sign the "Design Certification" section of the Form R-2. An Inspector shall indicate acceptance of the design by signing the "Certificate of Design Change Review" section of the Form R-2.

b) The information describing an alteration to a pressure-retaining item shall be identified on Form R-2 with a complete description of the scope of work for physical or non-physical changes. When the scope of work represents a change that will increase the Minimum Required Relieving Capacity (MRRC) of a pressure-retaining item, such as a change in heating surface, Maximum Designed Steaming Capacity (MDSC), or BTU/hr (W) heating capacity, the new MRRC shall be documented on Form R-2 and indicated on the appropriate nameplate of NBIC Part 3, Figure 5.7.5-b or NBIC Part 3, Figure 5.7.5-c.

c) Final preparation of Form R-2, including gathering and attaching supporting reports, shall be the responsibility of the "R" Certificate Holder that performed the construction portion of the alteration. The construction organization shall complete the Form R-2 provided by the design organization, including the "Construction Certification" section of the form. An Inspector shall indicate that the work complies with the applicable requirements of this code by completing and signing the "Certificate of Inspection" section of the form. When no construction work is performed (e.g., a re-rating with no physical changes), the "R" Certificate Holder responsible for the design shall prepare the Form R-2, including gathering and attaching of supporting documentation.

d) The following shall be attached to and become a part of completed Form R-2:

1) For ASME boilers and pressure vessels, a copy of the original Manufacturer's Data Report, when available;

2) Form R-3, Report of Parts Fabricated by Welding, Manufacturer's Partial Data Reports, or Certificates of Compliance, if applicable; and

3) For other than ASME, the manufacturer's reports (i.e., reports required by the original code of construction, etc.), when available.

5.2.3 PREPARATION OF FORM R-3 REPORT OF PARTS FABRICATED BY WELDING (19)

Using the instructions found at NBIC Part 3, 5.12.4.3 preparation of Form R-3 shall be the responsibility of the "R" Certificate Holder responsible for performing the work.

5.2.4 PREPARATION OF FORM R-4 REPORT SUPPLEMENT SHEET (19)

Using the instructions found at NBIC Part 3, 5.12.4.4 preparation of Form R-4 shall be the responsibility of the "R" Certificate Holder responsible for performing the work.

5.3 DISTRIBUTION OF FORM R-1

a) Legible copies of completed Form R-1, together with attachments, shall be distributed to the owner or user and Jurisdiction, if required, and shall be provided to the Inspector and the inservice Authorized Inspection Agency of the pressure retaining item upon request. Distribution of the R-1 form shall be made within 90 days of nameplate attachment

b) Distribution of Form R-1 and attachments shall be the responsibility of the organization performing the repair.

5.4 DISTRIBUTION OF FORM R-2

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

b) Legible copies of the completed Form R-2, together with attachments, shall be distributed to the owner-user, the "R" Certificate Holder responsible for design, and the Jurisdiction, if required, and shall be provided to the Inspector and inservice Authorized Inspection Agency of the pressure retaining item upon request. Distribution of the R-2 form shall be made within 90 days of nameplate attachment.

5.5 REGISTRATION OF FORMS — GENERAL

a) When registration of the forms are required, the Certificate Holder performing a repair or alteration shall submit the completed form, meeting the requirements of the NBIC, to the National Board.

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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