Date Distributed:

THE NATIONAL BOARD
OF BOILER AND PRESSURE VESSEL INSPECTORS

NATIONAL BOARD INSPECTION CODE SUBGROUP REPAIRS & ALTERATIONS

Minutes

Meeting of July 8, 2025
Cincinnati, OH

These minutes are subject to approval and are for 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
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1. **Call to Order**
   The meeting was called to order by Chair Underwood at 8:00 a.m. Eastern Time in Madisonville B on the 4th floor of the hotel.

2. **Roll call of Members and Introduction of Visitors**
   Secretary Hellman took roll of the members and visitors. (Attachment 1)

3. **Check for a Quorum**
   With 21/25 members present, a quorum was established.

4. **Announcements**
   - This meeting marks the end of Cycle B for the 2027 NBIC edition.
   - The National Board will be hosting a reception on Wednesday evening from 5:30 p.m. to 7:30 p.m. at Ault Park, on the 4th floor of the hotel.
   - The National Board will be hosting breakfast and lunch on Thursday for those attending the Main Committee meeting. Breakfast will be served from 7:00 a.m. to 8:00 a.m. in Madisonville A/B, and lunch will be served from 11:30 a.m. to 12:30 p.m. in Madisonville A/B.
   - Meeting schedules, meeting room layouts, and other helpful information can be found on the National Board website under the **NBIC** tab → NBIC Meeting Information.
   - The NBIC Committee has transitioned from NB File Share to SharePoint. Remember to add any attachments that you'd like to show during the meeting (proposals, reference documents, powerpoints, etc.) to the NBIC SharePoint site (nationalboard.sharepoint.com/sites/NBIC) **prior to the meeting**.
     - Note that access to the NBIC SharePoint site is limited to committee members only.
     - ALL powerpoint attachments/presentations must be sent to the NBIC Secretary for approval prior to the meeting.
     - Contact Jonathan Ellis (*nbicsecretary@nbbi.org*) for any questions regarding NBIC SharePoint access.
   - When possible, please submit proposals in Word format showing "strike through/underline." Project Managers: please ensure any proposals containing text from previous NBIC editions are updated with text from the most current edition.
   - If you'd like to request a new Interpretation or Action item, do so on the National Board Business Center.
     - Anyone, member or not, can request a new item.
   - As a reminder, anyone who would like to be considered for membership of a group or committee:
     - Should attend at least two meetings prior to being put on the agenda for membership consideration. The nominee may be placed on the agenda for voting during their third meeting, pending the Chair's approval.
     - The nominee must submit the formal request along with their resume to the NBIC Secretary **PRIOR TO** the meeting. *nbicsecretary@nbbi.org*
     - If elected by the membership, the member will serve a term of three years.
   - Thank you to everyone who registered online for this meeting. The online registration is very helpful for planning our reception, meals, room setup, etc. It is also a good way to make sure we have the most up-to-date contact information. Please continue to use the online registration for each meeting.

- With the release of the new 2025 Edition of the NBIC the National Board has a gift for all NBIC Committee Members to show our appreciation for all your hard work. Please see Jonathan or Luis in the NB office (Mt. Washington Room), located here on the 4th Floor to receive yours.

5. **Awards and Special Recognitions**
   Mr. Paul Davis – 5 years on SG R&A
   Mr. Tom White – 10 years on SG R&A
   Mr. Walt Sperko – 10 years on SG R&A

6. **Adoption of the Agenda**
   The Agenda was unanimously approved as revised: Added A25-42

7. **Approval of the Minutes of the January 2025 Meeting**
   The minutes from the January 2025 meeting were UA by the membership.

8. **Review of Rosters**
   a. **Membership Nominations – Not at this time.**

   b. **Membership Reappointments - None**

   c. **Officer Nominations - None**

   d. **Resignations – Rick Valdez is stepping down from SG but will continue to serve on SC R&A.**

9. **Action Items**

Item Number: A21-45	**NBIC Location: Part 3, Supplements**	**No Attachment**
General Description: Engineered Repairs and Alterations Supplement **Subgroup:** Repairs and Alterations **Task Group:** M. Schaser (PM), B. Boseo, B. Ray, D. Marek, R. Underwood, J. Siefert, P. Becker **Explanation of Need:** : In an effort to simplify the main body of NBIC Part 3, we are proposing a new Supplement called Engineered Repairs and Alterations which will import some existing, more complex activities from the main body and then eventually add new repair and alteration activities that are not currently addressed in the Part 3. **SG R&A Jan. 2025 Meeting Action:** M Schaser presented a PR and is on hold until the new engineered repairs scope is approved by BOT. **SG R&A July 2025 Meeting Action:** M. Schaser presented a motion to **Close w/No Action**, which was seconded and **UA**.		

Item Number: A21-53 **NBIC Location: Part 3, S8.5 a)** **Attachment 2**

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

Subgroup: Repairs and Alterations

Task Group: P. Gilston (PM), E. Cutlip, A. Triplett

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

SG R&A Jan. 2025 Meeting Action: P. Gilston presented Rev. 3 of his proposal to show changes from previous version. After discussion, Mr. Gilston decided to revise further and submit the proposal via LB to the SG. This was a **PR**.
Update: SG LB in progress until 7/8/25 (current vote: 15-2-0 as of 7/3/25)

SG R&A July 2025 Meeting Action: P. Gilston presented Rev. 4 of the proposal. Slight revisions were made, and the proposal was **UA as revised**.

Item Number: A23-09 **NBIC Location: Part 3, New Supplement** **Attachment 3**

General Description: Scope and Rules for use of Additive Manufacturing Pressure Parts

Subgroup: Repairs and Alterations

Task Group: T. Melfi (PM), G. Galanes, J. Siefert, B. Schaefer, W. Sperko, J. Ferreira, J. Getter, T. Seime, M. Wadkinson

Explanation of Need: Developing rules for the use of additive manufacturing pressure parts in alterations.

SG R&A Jan. 2025 Meeting Action: G. Galanes presented a status update. This proposal passed SG LB (18-0) and will be on SC R&A's agenda. **Status Update.**

NOTE: This item was approved by SC letter ballot on April 19, 2025. It is ready to be presented to the Main Committee.

SG R&A July 2025 Meeting Action: - G. Galanes presented an update that this will be discussed as SC and is ready for MC.

Item Number: A23-21	NBIC Location: Part 3, 3.3.4.9	No Attachment

General Description: Boiler tube plug guidelines and inclusion or watertube boilers

Subgroup: Repairs and Alterations

Task Group: S. Lombardo (PM), P. Gilston, K. Moore, A. Triplett T. White, J. Ferriera

Explanation of Need: Currently both firetube and watertube boilers require a boiler tube be plugged when replacement of a tube is not practicable at the time the defective tube is detected.

SG R&A Jan. 2025 Meeting Action: S. Lombardo was selected as the new PM to replace E. Cutlip. This was a **PR**.

SG R&A July 2025 Meeting Action: P. Gilston presented a **PR**.

Item Number: A23-24	NBIC Location: Part 3	Attachment 4

General Description: Repairs to quick actuating closures

Subgroup: Repairs and Alterations

Task Group: T. McBee (PM), C. Becker, M. Schaser, A. Khssassi, R. Smith

Explanation of Need: Put safe guidelines for repairs to quick actuating closures.

SG R&A Jan. 2025 Meeting Action: This proposal is currently being balloted to Main Committee – Status update

NOTE: This item is currently out for an SC R&A ballot, which is scheduled to close on July 2, 2025.

SG R&A July 2025 Meeting Action: Update - Passed SC LB 7/2/25. Ready for MC.

Item Number: A23-35	NBIC Location: All Parts, 9.1	No Attachment

General Description: Definition of "non-load bearing attachment" (All Parts)

Subgroup: Repairs and Alterations

Task Group: T. White (PM), A. Khssassi , J. Walker, P. Lentzer

Explanation of Need: The term "nonload bearing attachment" is used as a basis for determining a routine repair but is not defined in the NBIC.

SG R&A Jan. 2025 Meeting Action: T. White presented a PR.

SG R&A July 2025 Meeting Action: T. White presented a PR.

Item Number: A23-61 **NBIC Location: Part 3, S9.3** **No Attachment**

General Description: Revise NBIC R-2 Report and guide

Subgroup: Repairs and Alterations

Task Group: B. Schaefer (PM), T. LeBeau, S. Marks

Explanation of Need: Updates to the R-2 Report and the guide for completing R Report.

SG R&A Jan. 2025 Meeting Action: T. LeBeau presented a proposal, and discussions regarding de-coupling the "Pressure Testing" section of the form from the Construction portion led to this to be revised further. Stacey Marks was added to the TG. This was a **PR**.

SG R&A July 2025 Meeting Action: B. Schaefer presented a **PR**. A proposal that was revised based on discussion. Additional revisions will be made with the intention of sending them to SG LB.

Item Number: A23-68 **NBIC Location: Part 3, 3.4.4 c) and d)** **No Attachment**

General Description: Changes to Examples of Alterations

Subgroup: Repairs and Alterations

Task Group: M. Schaser (PM), T. McBee, P. Becker, P. Davis

Explanation of Need: The current wording of 3.4.4.d (2023) is open ended and may result in allowing significant design changes to a pressure vessel under the guise of a repair when an alteration is a more appropriate classification. Rewording is required to limit the scope of potential design changes.

SG R&A Jan. 2025 Meeting Action: M. Schaser presented a **PR**. The proposal led to discussions on the need to revise the definition of "Alteration". P. Davis was added to the TG to assist with revising the format/content of the examples of alterations further. Mr. Lane Baker requested to be removed from the TG.

SG R&A July 2025 Meeting Action: B. Schaefer presented a motion to **Close w/No Action** that was UA, based on discussion to revise the definition of "Alteration" rather than revise the list of examples.

Item Number: A23-77 **NBIC Location: Part 3, 4.2 a)** **No Attachment**

General Description: Performance of Original NDE During Repairs and Alterations

Subgroup: Repairs and Alterations

Task Group: A. Triplett (PM), S. Frazier, J. Walker, R. Collins, P. Becker, P. Lentzer, A. Triplett

Explanation of Need: The existing language in Part 3, Section 4, Paragraph 4.2.a does not provide enough guidance or flexibility for Repair Organizations and owners to prescribe appropriate NDE for repairs/alterations to existing welds. Based on the limited, often non-specific documentation typically available to these entities during NBIC repairs and alterations, additional allowances and direction should be provided.

SG R&A Jan. 2025 Meeting Action: T. White presented that a proposal based on the 2025 Ed. will be worked on. This was a **PR**.

SG R&A July 2025 Meeting Action: T. White presented a **PR**.

Item Number: A24-11 **NBIC Location: Part 3, S9** **No Attachment**

General Description: Addition of a section on the R-1 Form for "Unresolved Issues"

Subgroup: Repairs and Alterations

Task Group: M. Quisenberry (PM), T. Seime, T. McBee, L. Dutra, M. Toth, A. Khssassi, M. Vogt

Explanation of Need: There have been multiple instances discussed during NBIC meetings of Certificate Holders having to leave known defects unrepaired because of the owner/user not wanting to make the repair. This field would allow AIA and Jurisdictional Authorities to be made aware of known and identified issues with a pressure retaining item that were not corrected. Additionally, this provides cover for the Certificate Holder that they identified the defect, brought it to everyone's attention, and the owner/user decided to leave it.

SG R&A Jan. 2025 Meeting Action: M. Quisenberry presented. Discussions regarding liability led to this being pulled back as a **PR**. The following were added to the TG: L. Dutra, M. Toth, A. Khssassi, M. Vogt.

SG R&A July 2025 Meeting Action: M. Quisenberry made a motion to **Close w/No Action**, which was UA.

Item Number: A24-17 **NBIC Location: Part 3, 5.7.5 b)** **Attachment 5**

General Description: Specific Requirements For Stamping And Nameplates

Subgroup: Repairs and Alterations

Task Group: B. Schaefer (PM), B. Schaefer, A. Khssassi, J. Ferreira and T. LeBeau

Explanation of Need: 2023 ASME Section VIII-Div 1 UG-119(c)(5) has been revised to allow for the use of mechanical etching or laser annealing on nameplates.

SG R&A Jan. 2025 Meeting Action: B. Schaefer selected as PM (replaces E. Cutlip). J. Ferreira and T. LeBeau added to the TG. This was a **PR**.

SG R&A July 2025 Meeting Action: B. Schaefer presented a proposal that was **revised and UA** by the SG.

Item Number: A24-18 **NBIC Location: Part 3, 9.1** **Attachment 6**

General Description: Definition of Controlled Fill

Subgroup: Repairs and Alterations

Task Group: P. Gilston (PM), A. Triplett, R. Collins, F. Johnson

Explanation of Need: Interpretation item I 23-79 addresses the use of the term 'controlled fill' in relation to welding method 6. The term is used in 2.5.3 d in relation to welding method 6 and more specifically in Supplement 8. Supplement 8 gives a lot of detail in schematics about a controlled fill in terms of weld bead placement, its use in controlling heat input etc., but in Welding Method 6 the term is not specifically used, but direction for welding is given, typically preheats are specified, electrode size for SMAW, and the use of stringer beads only.

SG R&A Jan. 2025 Meeting Action: P. Gilston presented. The motion failed because many committee members felt that the definition presented in the proposal should match definitions used elsewhere instead of coming up with a new definition. This item will be sent back to Subcommittee R&A for further work. This was a **PR**.

SG R&A July 2025 Meeting Action: P. Gilston presented a previous proposal that was revised based on discussion and was **UA** by the SG. This is a definition (all Parts), so **a LB will go to Parts 1, 2, and 4.**

Item Number: A24-20	**NBIC Location: Part 3, 9.1**	**No Attachment**

General Description: Define "Engineered Repairs" and "Engineered Alterations"

Subgroup: Repairs and Alterations

Task Group: M. Schaser (PM), B. Ray, R. Underwood, B. Boseo, D. Marek, J. Siefert, P. Becker

Explanation of Need: The new supplement dealing with "Engineered Repairs and Alterations" (A21-45) will impact Part 3 Section 1, the NB-415, QRRs, the application process for Certificate Holders, and other documents to be determined. Defining "Engineered Repairs" and "Engineered Alterations" clarify the intent for these new scopes.

SG R&A Jan. 2025 Meeting Action: M. Schaser presented a **PR** until BOT allows for the revisions in NB-415 to be accepted.

SG R&A July 2025 Meeting Action: M. Schaser presented a **PR,** new "Advanced Repairs" items can now move forward.

Item Number: A24-21	**NBIC Location: Part 3, 9.1**	**No Attachment**

General Description: Engineered Repairs and Alterations - Section 1 Scope and Manual reqs

Subgroup: Repairs and Alterations

Task Group: M. Schaser (PM), B. Ray, R. Underwood, B. Boseo, D. Marek, J. Siefert, P. Becker

Explanation of Need: The scope of "Engineered Repairs and Alterations" (A21-45) needs to be clarified in 1.4.1 d) and reflected in the scope statement requirements for manuals in 1.5.1 a).

July 2024 Meeting Action: M. Schaser presented a PR.

SG R&A Jan. 2025 Meeting Action: M. Schaser presented a **PR**.

SG R&A July 2025 Meeting Action: M. Schaser presented a **PR**

Item Number: A24-96 **NBIC Location: Part 3, 5.5 a)** **No Attachment**

General Description: Add examples of repairs and alterations specific to Electrochemical Stacks

Subgroup: Repairs and Alterations

Task Group: A. Triplett (PM), R. Collins, R. Miletti

Explanation of Need: With inclusion and initial deployments of electrochemical stacks as U Stamped pressure vessels under ASME BPVC Section VIII Division 1 and Code Case 3078, these stacks are starting to be shipped and registered with the National Board. Some basic examples of allowed repairs are needed to help guide an understanding of limitations for electrochemical stacks.

SG R&A January 2025 Meeting Action: A. Triplett presented, and discussion was held regarding that this proposal was predicated on the existing language dealing with PHE, however there is no definition of "active cell components" as used in the proposal. Mr. Triplett indicated he would work with Mr. Matt Sweetland (gave presentation on ECS and is originator of this Code revision) to address the concerns of the TG. Riley Collins and Ray Miletti were added to the TG. This was a **PR**.

SG R&A July 2025 Meeting Action: A. Triplett presented, and this will be sent to SG LB once the proposal can be reviewed by an ECS subject matter expert. This was a **PR**.

Item Number: A24-98 **NBIC Location: Part 3, 2.5.2** **No Attachment**

General Description: Review and revise the PWHT Requirements in 2.5.2

Subgroup: Repairs and Alterations

Task Group: P. Gilston (PM), M. Schaser, W. Sperko

Explanation of Need: Simplify PWHT requirements in 2.5.2.

January 2025 Meeting Action: P. Gilston presented a **PR** - that he will be revising to simplify Heat Band and Soak Band dimensions and will be submitting a Rvw & Comment LB in the coming days. M. Schaser and W. Sperko were added to the SG.

SG R&A July 2025 Meeting Action: P. Gilston presented a **PR**.

Item Number: A25-04	**NBIC Location: Part 3, 2.5.3**	**No Attachment**

General Description: Part 3, 2.5.3 Special Service Equipment

Subgroup: Repairs and Alterations

Task Group: R. Derby (PM), P. Gilston

Explanation of Need: An interpretation request was received regarding the use of alternate welding methods for pressure equipment identified as Special Service. Comments received in the initial R&C indicated that the current words did not support the proposed Q&A. The proposal had been presented as an intent interpretation, and the comment was made if this was the desire, then to have a separate action item.

January 2025 Meeting Action: P. Gilston presented a new proposal (added today) that was revised and **UA** by the SG.

SG R&A July 2025 Meeting Action: P. Gilston presented an update that this is ready for SC.

New Action Items:

Item Number: A25-18	**NBIC Location: Part 3, 5.7.5**	**Attachment 7**

General Description: Requirements for Stamping and Nameplates

Subgroup: Repairs and Alterations

Task Group: B. McGuire (PM)

Explanation of Need: which contains critical identification information. However, HRSG boilers differ in that they have multiple master nameplates for different sections (e.g., HP, LP, economizer), all located on the outer casing of the boiler. Currently, NBIC repair nameplates do not provide a way to indicate which specific section was repaired. This limitation creates confusion for future inspections and maintenance, as there is no clear indication of which section underwent repairs. Adding a requirement for repair nameplates to include the specific HRSG boiler section being repaired will enhance clarity and traceability.

SG R&A July 2025 Meeting Action: B. McGuire presented a proposal that was revised based on discussion. The proposal was **Approved w/1 Negative** (L. Baker) (Attachment 7a).

Item Number: A25-20	NBIC Location: Part 3, 3.3.4.6	No Attachment

General Description: Adoption of reinforcement/fillet welded patches from PCC-2

Subgroup: Repairs and Alterations

Task Group: M. Schaser (PM)

Explanation of Need: Oil refineries are scant on shutdown opportunities and vital to the fuel needs of the community. At times inspection departments will detect corrosion on an in-service piece of equipment and be unable to clean it up for internal entry without a planned outage. Fillet welded patches are a safer alternative to external weld metal build up, or fitness for service.

SG R&A July 2025 Meeting Action: M. Schaser presented a **PR**.

Item Number: A25-21	NBIC Location: Part 3, S11.2.3 and S11.3.2	Attachment 8

General Description: Synchronize/Revise Repairs & Alterations of VIII-2, VIII-3 PRIs

Subgroup: Repairs and Alterations

Task Group: R. Collins (PM)

Explanation of Need: Mr. Tim Gardner, NBBI Senior Staff Engineer/Training Instructor, plans to create an online course for repairs of ASME Sect VIII-2 and VIII-3 PRIs but the current requirements in S11.2.3 and S11.3.2 (formerly 3.3.5 and 3.4.5) do not seem to be in agreement.

SG R&A July 2025 Meeting Action: R. Collins presented a **PR**, as he will reach out to NBBI staff to verify if "Plan" is preferred/acceptable rather than "Specification". This will be sent to SG LB in the future.

Item Number: A25-22	NBIC Location: Part 3, Table 2.5.1	No Attachment

General Description: Revise Part 3, Table 2.5.1

Subgroup: Repairs and Alterations

Task Group: L. Dutra (PM), G. Galanes

Explanation of Need: There have been changes to materials in the ASME Code that have made a review/revision of Table 2.5.1 necessary. If anything, the obsolete group numbers should be deleted. It will be up to the committee to decide whether to add the missing P/group numbers and the associated temperatures.

SG R&A July 2025 Meeting Action: L. Dutra presented a **PR**. G. Galanes was added to the taskgroup.

Item Number: A25-25 **NBIC Location: Part 3, S11.2.2** **Attachment 9**

General Description: Repair of PRIs Without Complete Removal of Defect

Subgroup: Repairs and Alterations

Task Group: T. LeBeau (PM)

Explanation of Need: To clarify this repair activity can be used for welded or non-welded repairs. This proposal will remove reference to welded repairs in S11.2.2 and only refer to "repair."

SG R&A July 2025 Meeting Action: T. LeBeau presented a **PR**. The revision to the proposal to remove the word “welded repairs” and “replace with Engineered Repairs” was discussed at length, and additional revisions are needed.

Item Number: A25-26 **NBIC Location: Part 3, 3.2.2 and 5.7.4** **Attachment 10**

General Description: Stamping of non-ASME Parts and Distribution of Form R-3

Subgroup: Repairs and Alterations

Task Group: P. Gilston (PM)

Explanation of Need: Part 3 does not address the distribution of the R-3 and provides no specific details on how to stamp non-ASME parts fabricated by the R Certificate Holder.

Update: SG LB in progress (6/10/25 - 7/2/25)

SG R&A July 2025 Meeting Action: P. Gilston presented. This failed LB (15-6-1), however the proposal presented was revised and **Approved w/1 Abstention** (M. Toth) (Attachment 10a).

Item Number: A25-28 **NBIC Location: Part 3, 1.3 b) and 9.1** **Attachment 11**

General Description: Remove references to FIA's throughout - This is now a scope under OUIO

Subgroup: Repairs and Alterations

Task Group: A. Khssassi (PM)

Explanation of Need: FIA's are to be a scope under OUIO. Definitions have been removed from RCI-1. This will remove references in the: Introduction; 1.3 b); and in the definition of an Inservice AIA.

SG R&A July 2025 Meeting Action: A. Khssassi presented a proposal that was **UA**.

Item Number: A25-29	NBIC Location: Part 3, 2.5.3 and 3.3	No Attachment

General Description: Referencing for Weld Metal, Filler Metal etc.

Subgroup: Repairs and Alterations

Task Group: P. Gilston (PM)

Explanation of Need: Within Part 3, welding consumables are referred to in several different ways e.g., filler metal, weld metal etc. This item is to review these references and identify if a single reference description is beneficial for users of the Code.

SG R&A July 2025 Meeting Action: P. Gilston presented a **PR**.

Item Number: A25-42	NBIC Location: Part 3, Supplement 11	Attachment 12

General Description: Renaming Supplement 11

Subgroup: Repairs and Alterations

Task Group: M. Schaser (PM)

Explanation of Need: Removing "Engineered" from the title so as not to suggest that the work would require direct involvement from an engineer or engineering certification. The purpose of the supplement is to provide repairs activities that have been developed with sound engineering judgment backed up with technical references. In some cases, an engineering evaluation will be recommended.

SG R&A July 2025 Meeting Action: M. Schaser presented a proposal that was **UA**.

10. Future Meetings

- January 12-15, 2026 – New Orleans, LA

11. Adjournment @ 12:25 PM

Respectfully submitted,

Terrence Hellman

Terrence Hellman

SG R&A - Cincinnati, OH - July 8, 2025

Present	Full Name	Email Address	Company Name	Registration Type	Role
x	Underwood, Bob	robert_underwood@hsb.com	HSB	In-person	Chair
x	Davis, Paul	paul.davis22@woodplc.com	Wood Group USA, Inc.	In-person	Chair, Vice
x	Baker, Lane	lbaker@us.tuv.com			Member
x	Collins, Riley	rileycollins@eastman.com	Eastman Chemical Company	In-person	Member
x	Dutra, Louis	Ldutra@Emcor.net	EMCOR Mesa Energy	In-person	Member
x	Ferreira, Jon	jonathan_ferreira@hsb.com	Hartford Steam Boiler Inspection and Insurance Company	In-person	Member
	Frazier, Steven	steve.frazier@seattle.gov			Member
	Hopkins, Craig	chopkins@seattleboiler.com			Member
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x	LeBeau, Tim	tclebeau@southernco.com	Southern Company Services	In-person	Member
x	McBee, Timothy	Timothy.McBee@tuvsud.com	ARISE Boiler Inspection and Insurance Company RRG	In-person	Member
x	McGuire, Bob	robert.b.mcguire@ge.com			Member
x	Quisenberry, Michael	michael@spartan-mech.com			Member
x	Schaefer, Ben	bschaefer@aep.com	American Electric Company (AEP)	In-person	Member
x	Schaser, Matt	mschaser@e2g.com	The Equity Engineering Group, Inc.	In-person	Member
x	Seime, Trevor	tsseime@nd.gov	State of North Dakota	In-person	Member
x	Sekely, Jim	jsekely@comcast.net	Welding Services, Inc.	Remote	Member
x	Siefert, John	jsiefert@epri.com	EPRI	In-person	Member
x	Sperko, Walter	wsperko@bellsouth.net	Sperko Engineering	In-person	Member
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x	Triplett, Andrew	triplettal@ornl.gov	UT-Battelle, LLC	In-person	Member
x	Valdez, Rick	rvaldez@prim.com			Member
	Vogt, Mark	Mark.Vogt@vistracorp.com			Member
x	White, Thomas	thomas.white@nrg.com	NRG Energy	In-person	Member
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x	Bates, Johnathon	bates@ibb026.org	Boilermakers	In-person	
x	Becker, Patricia	pbecker3135@gmail.com	EPRI	In-person	
x	Boseo, Brian	bmboseo@burnsmcd.com	Burns & McDonnell Construction	In-person	
x	Burpee, John	john.h.burpee@maine.gov	State of Maine	In-person	
x	Carlson, Michael	camx235@lni.wa.gov	State of Washington	In-person	
x	Chatham, Everett	echatham@becht.com	Becht	In-person	
	Chowdhury, Dibu	DCHOWDHURY@HYDROinc.com	Hydro Inc	In-person	
x	Cochran, Lee	lcochran@nationalboard.org	National Board	Staff	
x	Derby, Bob	rderby@uanet.org	UA Education and Training Department	In-person	
x	Derrick, Kiwi	kiwi.derrick@chevron.com	Chevron	In-person	
	Drinnen, Jon	Jdrinnen@emcor.net	EMCOR Mesa Energy	In-person	
x	Ezernack, John	john.ezernack@cna.com	CNA Insurance Company	In-person	
x	Fee, Hagan	feeh@bmwc.com	BMWC Constructors, Inc.	In-person	
	Frazier, Steve	steve.frazier@seattle.gov	City of Seattle	Remote	
x	Galanes, George	ggalanes@diamondtechnicalservices.com	DTS, Inc.	In-person	
x	Gilston, Philip	philip_gilston@hsb.com	Hartford Steam Boiler	Remote	
	Goossens, Greg	ggoossens@nationalboard.org	NBBI	Staff	

x	Handy, Rodney	rodney.handy@fm.com	FM	In-person	
x	Hayes, John	jhayes@ccsboiler.com	Combustion & Control Solutions Inc.	In-person	
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	Warburton, David	David.Warburton@myfloridacfo.com	State of Florida	Remote	
x	Militti, Ray			In-person	
x	Moore, Kathy			In-person	
x	Mobley, Jason			In-person	
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THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

PROPOSED REVISION OR ADDITION

Item No.

A21-53 Rev 04

Subject/Title

Supplement 8 Weld and Post Repair Inspection of Creep Strength Enhanced Ferritic Steel Pressure Equipment

NBIC Location

NBIC Part 3 Repairs and Alterations Supplement 8 S8.5 a)

Project Manager and Task Group

Philip Gilston, Mark Horbaczewski

Source (Name/email)

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

Statement of Need

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

As part of the Inservice Inspector pre-inspection activities is a requirement to review repairs/alterations (Part 2, 4.5.2 a) 7) to ascertain the history of the equipment being inspected. In the report of inspection forms NB-6 and NB-7 in section 10 comments to be addressed include verification of repairs.

Background Information

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

Related SG Inspection item 22-06.

This proposed revision is to ensure that there is correct and sufficient information for the "Inservice Inspector" to review and validate that the inspection plan is being followed.

This revision is based on discussion at the SG R&A meeting January 2025.

Rev 04

S8.5 a), Revised opening of sentence eliminating specifically when the plan is prepared per Mr. Schaser.

S8.5 a), Revised the middle part of the first sentence from '…to ensure safe operation and margin to locate and monitor defect growth in the weld repair area based…' to '…to ensure safe operation by ensuring no new defects form in the weld repair area based…'.

S8.5 b), 're-inspection' has been revised to 'inspection' per Mr. Collins comment.

S8.5 b) iii, removed end of life requirement per Mr. Siefert.

S8.5 c), revised 'Post Inspection Repair Plan' to 'Post Repair Inspection Plan' per Mr. Khssassi.

S8.5 c), removed the words requiring the inspection plan to be attached to the R Report for submittal. The plan is still to be referenced in the 'Remarks'.

S8.5 POST REPAIR INSPECTION	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.	a) A post repair inspection plan shall be developed by the User or Owner and implemented a~~A~~fter the completion of weld repairs to CSEF steels~~, post inspection requirements shall be developed and implemented based~~ to ensure safe operation by ensuring no new defects form in the weld repair area based on acceptance from the Inspector~~-~~, and if applicable, the Jurisdiction. Post repair inspection shall be on-going ~~until~~ for the remaining service of the component~~. reaches end of life or is replaced.~~ b) The post repair inspection plan shall include but not be limited to: i. Method of examination, the selected non-destructive examination method shall provide meaningful results and shall follow NBIC Part 3, Section 4. ii. Examination intervals The User or Owner may revise the ~~re-~~inspection interval based on inspection results from previous inspections. c) The post repair inspection plan shall be referenced in the Remarks section of the R report. ~~A copy of the~~The R report shall be registered with the National Board. ~~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.~~

	VOTE						
Committee	**Approved**	**Disapproved**	**Abstained**	**Not Voting**	**Passed**	**Failed**	**Date**

Engineered Alterations

NB23-09 Rev 12

Supplement SXX

Pressure Retaining Parts Fabricated using Additively Manufactured (AM) Material

Section XX.1 Scope

Additively Manufactured (AM) parts are those that have been fabricated from material made by direct energy deposition (DED) using the gas metal arc welding (GMAW) process. The requirements listed under Section XX.2 for installation of AM parts are based on references to other known international Codes and Standards (e.g., ASME Boiler and Pressure Vessel Code).

Section XX.2 Installation of AM Pressure Retaining Parts

The use of AM parts that are being installed by a National Board R-Certificate Holder shall be considered an alteration and shall require a Form R-2. If production of AM parts is performed by a National Board R-Certificate Holder, this activity shall be documented on a Form R-3. AM parts that are installed shall be limited to service temperatures below the creep range (e.g. where time independent properties govern).

In addition to the requirements for an alteration, the following information shall be provided for the AM part and attached to the applicable NBIC Form(s) referenced above:

(a) A copy of the Additive Manufacturing Specification (AMS). As a minimum the following information shall be included in the AMS:

a). 1). The original code of construction for the AM component.

a). 2). File names with current revision for all model data describing the geometry and build strategy needed to fabricate the physical component.

a). 3). The applicable Material Specification listed in the original code of construction for the pressure retaining item.

a). 4). The applicable Filler Metal Specification and AWS Classification.

a). 5). Allowable ranges of process variables from Section IX Article VI “Material Manufacturing using Wire Additive Welding”.

a). 6). The nondestructive evaluation and testing requirements being applied to the AM Material from the applicable original code of construction.

a). 7). Supplemental examination requirements identified by the Additive Manufacturer, the User or in contract specification requirements.

a). 8). Post-processing requirements identified by the Additive Manufacturer, the User or in contract specification requirements.

a). 9). Thermal treatment requirements for the AM Material identified by the Additive Manufacturer, the User or in contract specification requirements.

a).10). Supplemental requirements identified by the Additive Manufacturer, the User or in contract specification requirements (e.g., corrosion testing).

a). 11). Documentation that shows prior to fabrication, the AMS has been reviewed and accepted by the Inspector, and the Jurisdiction, if required.

(b) A copy of the design calculations for the AM pressure part which shall be based on the original code of construction requirements.

(c) A copy of the welding procedure specification(s) followed for AM Material fabrication and welding operator qualification record(s).

(d) A copy of the Material Test Report. The data recorded on the Material Test Report shall reflect the test results from the witness specimen. The following criteria are applicable to and shall be addressed in the Material Test Report:

d). 1). At least one AM product witness tension test specimen shall be manufactured and tested from each production build.

d). 2). At least one AM product witness chemical composition test specimen shall be manufactured and tested from each production build.

d). 3). When toughness testing is required by the original code of construction, at least one AM product witness toughness test sample shall be manufactured and tested from each production build.

d). 4). All mechanical testing shall be performed on specimens in the final heat-treated condition identified in the AMS.

d). 5). When a production component requires the use of multiple heats of filler metal, AM product witness specimens for chemical composition, tension and other required testing shall be manufactured and tested from each heat of filler metal.

d.) 6). The witness specimens shall be produced using bounding heat inputs and interpass temperature that provide limiting values for tensile and toughness properties as determined by the Additive Manufacturer.

d). 7). The witness specimens shall be manufactured either immediately before, during, or immediately after each production build.

d). 8). All chemical composition, tension and toughness testing shall be performed in accordance with the requirements of Sections f), g), h), and j) below.

d). 9). Following any production test non-compliance, components fabricated during the build shall be dispositioned using the Additive Manufacturer's Quality Control Program.

d). 10). The results of the required witness specimen testing shall be documented in a Material Test Report certified by the Additive Manufacturer.

d). 11). The Material Test Report shall be included in the Additive Part Producer's construction records.

e) Chemical Composition Testing Requirements

e). 1). One AM witness specimen shall be subjected to chemical composition testing.

e). 2). The analytical method for chemical composition testing shall be in accordance with the Material Specification.

e). 3). The chemical composition of the specimens shall conform to the ASME filler metal specification identified in the AMS.

f) Mechanical Property Test Locations

f). 1). The build x, y, and z axes are defined in Figure 1.

f). 2). The z-axis is defined as normal to deposition layers (Parallel to Build Direction) as shown in Figure 1.

g) Tension Testing Requirements

g). 1). Tension test specimens shall be constructed with their long direction parallel to the z-axis as shown in Figure 1.

g). 2.) All room temperature tension testing shall be in accordance with ASTM E8 (see Appendix A and B).

g). 3). All elevated temperature tension testing shall be in accordance with ASTM E21 (see Appendix A and B).

h) Hardness Testing Requirements

h). 1). Hardness testing shall be performed on the witness specimen when required by the Material Specification, the original code of construction, or the AMS.

h). 2). Hardness testing shall comply with ASTM E10, ASTM E18 or ASTM E92.

i) Toughness Testing Requirements

i). 1). Toughness testing shall be performed when required by the Material Specification, original code of construction, or the AMS.

i). 2). When toughness testing is required, toughness testing shall be performed on the witness specimen.

i). 3). Toughness testing shall be performed in the orientation as shown in Figure 1.

i). 4). The acceptance criteria for toughness testing shall be as specified by the original code of construction.

j). A copy of nondestructive test reports as required by the original code of construction and any Owner/User contract specification requirements, if applicable.

k). Results of the hydrostatic test, when required, as performed in accordance with the rules of the original code of construction.

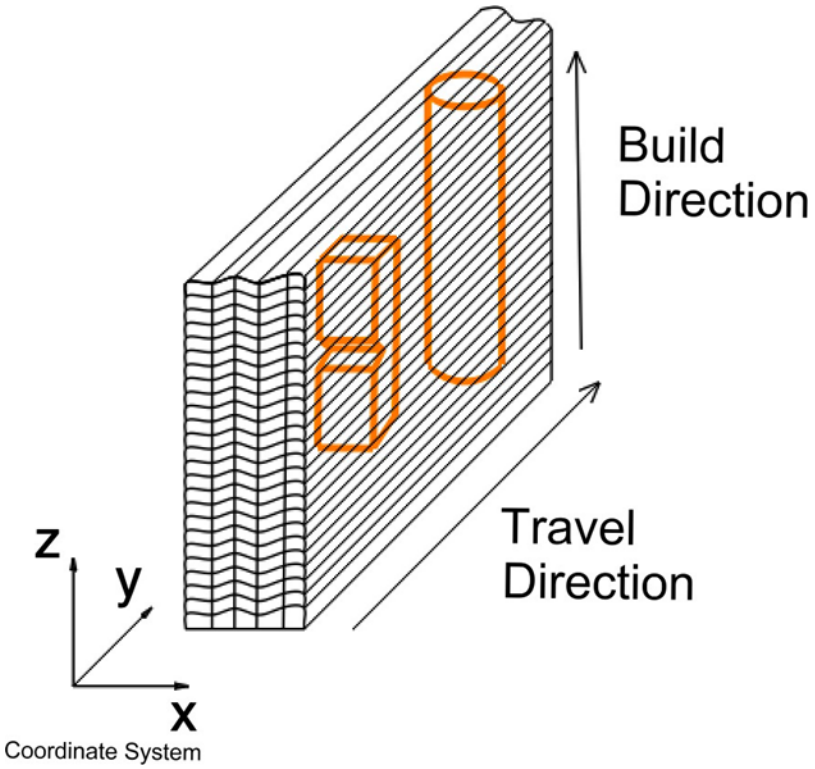

Figure 1 Material Manufacturing Coordinate System and Material Test Specimen Orientation

Appendix A Control Points and Data Point Definitions and Nomenclature

Point	Temperature	Strength	Description	Criteria
C1	Room	TS	Specified Minimum Tensile Strength	Specified Minimum Tensile Stre Material Specification
C2	Room	TS	The measured elongation from the tensile specimen is equal to the specified minimum elongation value in the Material Specification.	Specified Minimum Elongation Material Specification. Note: If the elongation in all the specimens exceeds the specifie elongation it is not required tha Point C2 be determined.
C3	Design	TS	Value from Table U at Design Temperature	Tensile Strength from ASME BP Part D, Table U at Design Temp
C4	Design	TS	Minimum Acceptable Value of Tensile Strength for High Temperature Test	Point C3/1.1 (See Paragraph 6(from Table U at Design Temper by 1.1
C5	Room	YS	Specified Minimum Yield Strength	Specified Minimum Yield Streng Material Specification
C6	Room	YS	The measured elongation from the tensile specimen is equal to the specified minimum elongation value in the Material Specification.	Specified Minimum Elongation Material Specification. Note: If the elongation in all the specimens exceeds the specifie elongation it is not required tha Point C6 be determined.
C7	Design	YS	Minimum Acceptable Value of Yield Strength for High Temperature Test	Yield Strength from ASME BPVC Part D Table Y-1 at Design Tem
D1	Room	TS	Minimum value of tensile strength from ASME BPVC Section IX, Part QW, Article VI tension test data	Tensile strength and elongation ASME BPVC Section IX, Part QW tension tests shall equal or exc specified minimum values in th Specification (Point C1) The elongation from the tensio exceed the specified minimum the Material Specification
D2	Design	TS	Tensile strength value from elevated temperature tension test.	Tensile strength value from ASI Section IX, Part QW, Article VI t shall equal or exceed value calc Point C4
D3	Room	YS	Minimum value of yield strength from ASME BPVC Section IX, Part QW, Article VI tension test data	Yield strength and elongation fr BPVC Section IX, Part QW, Artic tests shall equal or exceed the minimum values in the Materia (Point C5) The elongation from the tensio exceed the specified minimum the Material Specification
D4	Design	YS	Yield strength value from high temperature tension test	Yield strength value from ASME IX, Part QW, Article VI tension t or exceed value for Point C7

Appendix B Example Section IX, Part QW, Article VI Data Analysis

Given the test data shown below determined from a QW-600 bracketed weld qualification testing, calculate the allowable minimum yield and tensile strength values to be used for acceptance of the tensile test specimens for qualification and production witness specimens.

Target Material Specification - ASME SA-403 Grade 316L
Filler Material Specification - ER316LSi

Control Points - Example Data SA 403 Grade 316L (ksi)

C1	C2	C3	C4	C5	C6	C7
70	Elongation Controlled	59.7	59.7/1.1=54.3	25	Elongation Controlled	14.1

Example 1
Data Point D1 = 74 ksi
Data Point D2 = Control Point
C4 = 54.3 ksi
Data Point D3 =
30 ksi
Data Point D4 = Control Point C7= 14.1 ksi

Calculate the Minimum Allowable Tensile Strength and Yield Strength for the Qualification Build Specimen and the Production Witness Specimens Builds Specimen using Equation 1 and 2.

$AMTS_{Minimum}$ = Max [C1, D1 x C4/D2] = Max [70, 74 x 54.3/54.3] = 74

$AMYS_{Minimum}$= Max [C5, D3 x C7/D4] = Max [25, 30 x 14.1/14.1] = 30 ksi

Example 2
Data Point D1 = 74 ksi
Data Point D2 = Control Point
C3 = 59.7 ksi Data Point D3 =
30 Ksi
Data Point D4 = 17 ksi
Calculate the Minimum Allowable Tensile Strength and Yield Strength for the Qualification Build Specimen and the Production Witness Specimens Builds Specimen using Equation 1 and 2.

$AMTS_{Minimum}$ = Max [C1, D1 x C4/D2] = Max [70, 74 x 54.3/59.7] = 70 ksi

$AMYS_{Minimum}$= Max [C5, D3 x C7/D4] = Max [25, 30 x 14.1/17] = 25 ksi

THE NATIONAL BOARD
OF BOILER AND PRESSURE VESSEL INSPECTORS

PROPOSED REVISION OR ADDITION

Item No.

A23-24

Subject/Title

GENERAL REQUIREMENTS FOR REPAIRS TO QUICK-ACTUATING/QUICK-OPENING CLOSURES

NBIC Location

New SUPPLEMENT XX

Project Manager and Task Group

Tim McBee (PM), Chuck Becker, Matt Schaser, Robert Smith, Aziz Khssassi

Source (Name/Email)

Kathy Moore (kathymoore@joemoorecompany.com)

Statement of Need

There are many small stamp holders (which I am one of them) that do not understand the "uniqueness" of these repairs. I would like to see some engineering controls as part of this "section".

Background Information

The NBIC currently has no specific safe guidelines for Quick-Actuating/Quick-Opening repairs.

Existing Text	**Proposed**
None	**See attached**

A23-24
SUPPLEMENT XX
GENERAL REQUIREMENTS FOR REPAIRS TO QUICK-ACTUATING/QUICK-OPENING CLOSURES

SXX.1 SCOPE

This supplement provides additional requirements and guidelines above and beyond those cited in the main body of the NBIC code for repairs to quick-actuating/quick-opening closure pressure-retaining components referred throughout this supplement as "Quick Closures". Special consideration shall be given to meet the requirements set forth in NBIC Part 3, Section 2 through 5 as appropriate and inspection requirements identified in paragraph 2.3.6.5 in NBIC Part 2.

This supplement applies to the general component terminology and does not include all quick-~~actuating/quick-opening~~ closure designs. For details refer to the quick-~~actuating/quick-opening~~ closure manufacturer's partial data report, manufacturing drawings, service and maintenance ~~guidance~~documentation. ~~This list of manufacturer records should be consistent with ASME UG-35 required records~~Additional documents required by the original code of construction may be available for reference. No components furnished or specified by the Manufacturer of the quick closure shall be omitted~~removed~~ unless the Manufacturer's concurrence is received or good engineering judgement is obtained.

The components of quick closures include but are not limited to the following:
a) Cover (Head, Flat Plate, etc.)
b) Support Elements (Davit Hinge, Post Davit, Vertical/Slide Sides, etc.)
c) Locking Elements (Wedges, Latch, etc.)
d) Locking Mechanism (Rotating Locking Ring, Seal Flanges, Lugs etc.)
e) Holding Elements (Pins)
f) Interlock Device (Pressure Indicating Device)
g) Seal design

SXX.2 REPLACEMENT PARTS FOR QUICK CLOSURES

~~a) No components furnished or specified by the Manufacturer of the quick closure shall be removed unless Manufacturer's concurrence is received. In the event the original Manufacturer is no longer available, components shall not be removed.~~
b) Replacement pressure retaining parts shall be identical to the original equipment furnished. Substitutions may be allowed if they are approved by the Manufacturer or if the substitution has been determined acceptable through an engineering evaluation. The engineering evaluation shall be documented, ~~and~~ reviewed and accepted by a~~n~~ Repair Inspector and Jurisdiction, where required.
c) Quick closure replacement pressure-retaining parts shall be fabricated in accordance with the Manufacturer's design and the original code of construction.
d) Replacement of the nonpressure-retaining load bearing parts, when different from the Manufacturer's design, shall be evaluated for any possible effect on the pressure-retaining parts.
e) Replacement materials, including welding materials, shall be consistent with the original materials of construction, including heat treatment.

SXX.3 REPAIR GUIDE FOR QUICK CLOSURES

a) The Manufacturer's Data Report or Manufacturer's drawings when available, shall be carefully reviewed to determine the material of construction of each quick closure. If material data is not

available, positive material identification (PMI) to identify the material's chemistry and hardness testing shall be performed.

b) Weld repairs performed in accordance with NBIC Part 3 are permitted on quick closure pressure-retaining components that are manufactured from steel. Hinge pins or bolts shall not be welded. Special attention shall be paid to any requirements for the finished weld profile and PWHT.

c) Structural deterioration or damage caused by corrosion, thinning, or cracking shall not be repaired until its extent has been determined by suitable nondestructive examination.

d) The Certificate Holder shall have a plan covering the scope of the repair. The plan shall ensure that the work involved is compatible with the original design specification and good engineering practices.

e) Removing the quick closure mechanism components from one vessel for the installation on another vessel is STRICTLY PROHIBITED.

(f) When quick closures are repaired, the locking mechanism or locking device shall be operational per the quick closure Manufacturer's specifications.

SXX.4 ROUTINE REPAIRS

The following examples of repairs do not require stamping or nameplate attachment provided the repair procedure has been accepted by the Repair Inspector and the R-Certificate Holder has verified there will be no effect on the pressure-retaining capability of the quick closure.

a) Replacement of consumable parts, for example wedges.

b) Alignment adjustments

SXX.5 REPAIR OF DAMAGE

SXX.5.1 REPAIR OF QUICK CLOSURE WELDS

All welds associated with the quick closure pressure-retaining components should be repaired in accordance with the original manufacturer's design specifications. Special attention shall be paid to any requirements for the finished weld profile and PWHT.

SXX.5.2 REPAIR OF QUICK CLOSURE SURFACES

The repair of quick closure surfaces shall be limited to the restoration of wasted areas through weld build-up. The final surface shall be flush with nominal surface. Seating surfaces shall be machined back to original design specifications. External weld build-up is prohibited on closure components. Alternatively, Fitness-for Service (FFS) may be used to qualify local thin areas.

SXX.5.3 REPAIR OF QUICK CLOSURE MECHANISM

a) The designs of quick closure locking mechanisms are typically proprietary; therefore, all repairs shall be performed to restore the closure to the original design specifications. If design specifications, such

as original quick closure configuration and nominal thicknesses are not available, then all repairs shall be performed by the original manufacturer. If this is not practicable, the Certificate Holder shall contact an organization competent in quick ~~-actuating/quick-opening~~ closure design and construction to approve or establish a repair plan prior to implementing any repairs.

b) Safety devices (sensors, interlocks, etc.) removed during maintenance or repair shall be reinstalled per the original manufacturer's specifications.

c) Repairs shall avoid damaging gasket materials. If damage occurs to gasket materials, the gaskets shall be replaced before returning system back into service.

SXX.6 EXAMINATIONS AND TEST METHODS

NBIC Part 3, Section 4 is applicable for all post construction activities pertaining to examination and testing.

SXX.7 CERTIFICATION/DOCUMENTATION AND STAMPING

NBIC Part 3, Section 5 is applicable for all post construction activities pertaining to certification/documentation and stamping.

Stamping may also be waived per SXX.4 of this Supplement.

PROPOSED REVISION OR ADDITION

Item No.	A24-17
Subject/Title	Specific Requirements For Stamping and Nameplates
NBIC Location	NBIC Part 3, 5.7.5 a) and b)
Project Manager and TaskGroup	B. Schaefer (PM), TG - S. Marks, T. LeBeau, J. Ferreira, A. Khssassi
Source (Name/Email)	Certificate Administrator
Statement of Need	Allow alternative stamping method within the NBIC Part 3, Section 5, Paragraph 5.7.5 a) and b). Currently ASME Section VIII Div 1 (23), ASME Section I (23) - PG-106.6 and Mandatory Appendix VIII and ASME CA-1 (22) all allow other methods of stamping nameplates.
Background Information	I feel that the pressure vessel nameplates would look more professional with the use of mechanical etching. There wouldn't be anymore stampings that are upside-down, cock-eyed, wrong location on the plate, or uneven striking pressure that results in the edges not showing up clearly. When the above happens, I need to find someone capable of destroying the "said" nameplate (especially hand stamped symbols and marks) and then verify that the plate is destroyed.
Existing Text	5.7.5 Specific Requirements For Stamping and Nameplates a) Required data shall be in characters of at least 5/32 in. (4 mm) high, except that characters for pressure relief valve repair nameplates 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.
Proposed Text	a) Required data shall be in characters of at least 5/32 in. (4 mm) high, except that characters for pressure relief valve repair nameplates may be smaller. Markings may be produced by casting, etching, embossing, debossing, stamping, ~~or~~ engraving, or laser. Any marking by laser is permitted only on stainless steel and aluminum. No coating that obscures the marking shall be allowed. 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.~~ shall be made by direct application of the National Board Code Symbol Stamp. As an alternative: 1) The Code Symbol may be made by casting, embossing, engraving, etching, dot peening, laser, or any other process that will leave a legible and permanent image. 2) The applied Code Symbol shall be the same shape and configuration as the National Board Code Symbol Stamp.

Commented [LB1]: Cannot be hand engraving

	3) The process controls for the custody and method of marking shall be described in the Quality Management System.

	VOTE:						
COMMITTEE	Approved	Disapproved	Abstained	Not Voting	Passed	Failed	Date
SG R&A							
SC R&A							

CODE REVISIONS OR ADDITIONS

Request for code revisions or additions shall provide the following:

a) Proposed Revisions or Additions

For revisions, identify the rules of the code that require revision and submit a copy of the appropriate rules as they appear in the code, marked up with the proposed revision. For additions, provide the recommended wording referenced to the existing code rules.

b) Statement of Need

Provide a brief explanation of the need for the revision or addition.

c) Background Information

Provide background information to support the revision or addition, including any data or changes in technology that form the basis for the request that will allow the Committee to adequately evaluate the proposed revision or addition. Sketches, tables, figures, and graphs should be submitted as appropriate. When applicable, identify any pertinent paragraph in the code that would be affected by the revision or addition and identify paragraphs in the code that reference the paragraphs that are to be revised or

THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

PROPOSED REVISION OR ADDITION

Item No.

A 24-18 Rev 01

Subject/Title

Controlled Fill Definition

NBIC Location

All Parts, Section 9, Glossary of Terms

Project Manager and Task Group

Philip Gilston (PM), A. Triplett

Source (Name/email)

Philip Gilston (philip_gilston@hsb.com)

Statement of Need

There is no definition of the term 'controlled fill'.

Background Information

Interpretation item I 23-79 addresses the use of the term 'controlled fill' in NBIC Part 3, 2.5.3 d in relation to Welding Method 6 for Grade 91 material.

While the term 'controlled fill' is not specifically used in the text of Welding Method 6 (2.5.3.6), directions are given for such variables as typical preheats, electrode size for SMAW, and the use of stringer beads only. The term is used explicitly in Supplement 8 for CSEF repairs, where S8.3.b says that "To control heat input the weld repair shall be performed using a "controlled fill" technique"; details are also given on such items as preheats, electrode size, required fill pass overlap, etc., and a lot of detail is provided in schematics including specifics on weld bead placement.

Existing Text	Proposed Text	Clean Copy
None	**Changes form Rev 00 shown** **Controlled Fill** – ~~requirements specified~~~~control of~~ A weld technique for a ~~permitted weld~~ repair process ~~in order to manage heat input~~ to ensure satisfactory weld properties by ~~controlling distortion, promoting~~ tempering and minimizing the risk of cracking by addressing variables including but not limited to heat input, ~~such as~~ preheat and interpass temperature, weld consumable type and ~~diameter~~size, weld technique (stringer or weave~~),~~) and bead placement ~~etc~~.	**Controlled Fill** – ~~control~~ A ~~of~~ weld technique for a repair process to ensure satisfactory weld properties by ~~controlling distortion, promoting~~ tempering and minimizing the risk of cracking by addressing variables including but not limited to heat input, preheat and interpass temperature, weld consumable type and size, weld technique (stringer or weave) and bead placement.

	VOTE						
Committee	**Approved**	**Disapproved**	**Abstained**	**Not Voting**	**Passed**	**Failed**	**Date**

NBIC Action Item A25-18
Submitted by TEI Construction Services, Inc. (efeeney@teiservices.com)
June 12, 2025

THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

Subject:	Requirements for Stamping and Nameplates
NBIC Location:	2025 Part 3, 5.7.5
Statement of Need:	When performing repairs or alterations on boilers and pressure vessels, the industry standard is to affix a repair nameplate near the master nameplate, which contains critical identification information. However, HRSG boilers differ in that they have multiple master nameplates for different sections (e.g., HP, LP, economizer), all located on the outer casing of the boiler. Currently, NBIC repair nameplates do not provide a way to indicate which specific section was repaired. This limitation creates confusion for future inspections and maintenance, as there is no clear indication of which section underwent repairs. Adding a requirement for repair nameplates to include the specific HRSG boiler section being repaired will enhance clarity and traceability.
Background Information:	Our company specializes in repairs and alterations on boilers, including HRSG boilers. The current NBIC nameplate requirements are designed for traditional boilers, where a single master nameplate exists. However, in HRSG units, multiple nameplates exist for different sections, leading to challenges in documenting repairs effectively. This proposal ensures alignment with industry needs and prevents ambiguity in identifying repaired sections.

Proposed Text:

5.7.5 SPECIFIC REQUIREMENTS FOR STAMPING AND NAMEPLATES

a) Required data shall be in characters of at least 5/32 in. (4 mm) high, except that characters for pressure relief valve repair nameplates 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.

NBIC Action Item A25-18
Submitted by TEI Construction Services, Inc. (efeeney@teiservices.com)
June 12, 2025

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 nameplate affixed to the item.

d) The certificate holder shall use its full 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) When a repair or alteration is performed on a Heat Recovery Steam Generator (HRSG), where multiple master nameplates exist for different sections of the unit (e.g., HP, LP, economizer), the repair or alteration nameplate should include an additional marking to specify the section where the work was performed. This information should be clearly marked on the nameplate to ensure proper traceability for future inspections and maintenance.

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

1) Welding
2) Adhesive, bonding or cementing
3) Tamper-resistant mechanical fasteners of suitable metal construction

Outlook

FW: 25-18 dissent

From Lane Baker <lbaker@us.tuv.com>
Date Wed 7/9/2025 12:48 PM
To Terrence Hellman <THellman@nationalboard.org>

Lane Baker
Manager, Codes and Standards International

lbaker@us.tuv.com

TUV Rheinland AIA Services, LLC

From: Lane Baker
Sent: Tuesday, July 8, 2025 4:04 PM
To: Underwood Robert - Hartford-Remote-HSB <robert_underwood@hsb.com>
Cc: Stephen Norris <snorris@us.tuv.com>; Keith Gilmore <Keith.Gilmore@us.tuv.com>
Subject: 25-18 dissent

I voted negative on 25-18 asking for additional information to be stamped on nameplates. I understand the approved text does not "require" the additional information.

The purpose of a Repair or Alteration nameplate is to indicate to the Inservice Inspector something was repaired or altered in between inservice inspection. It is the responsibility of the Inservice Inspector to obtain a copy of the R1/2 report to determine what the task included. Determination of the activities performed must be provided by the operating concern by accessing the R-1/2 which should clearly discuss the scope of activities performed. The proposal 25-18 requests additional information on the nameplate to indicate what sub system of the boiler has been worked on. The end goal of this action item is to assist owners in file procedures for the R report and should not be a part of Code.

1. The conversation is limited to HRSG units with multiple sub systems only which constitutes a very small portion of boilers. (very limited applicability)
2. Inservice inspectors view and inspect the boiler as a single unit regardless of how many sub systems are present. Identification of which subsection the stamping applies too is of no value.
3. Does this imply multiple R reports are necessary when the work involves more than 1 system?
    a. How would you identify work across 2 or more systems
4. A single nameplate with multiple dates performed by a single stamp holder would not easily support multiple repair locations
5. Use of the word "should" implies it's a good idea for all users enter this information on the stamping whether it's necessary or not.
6. Nameplate modification requires the R stamp holder to modify the Plate layout real estate to include a field for boiler system

Lane Baker
Manager, Codes and Standards International

lbaker@us.tuv.com

TUV Rheinland AIA Services, LLC

NBIC Action Item A25-21
Submitted by Luis Ponce (LPonce@nbbi.org)
June 12, 2025

THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

Subject:	Synchronize/Revise Repairs & Alterations of VIII-2, VIII-3 PRIs
NBIC Location:	2025 Part 3, S11.2.3 b) and S11.3.2 a)
Statement of Need:	Mr. Tim Gardner, NBBI Senior Staff Engineer/Instructor Training, plans to create an online course for repairs of ASME Sect VIII-2 and VIII-3 PRIs but the current requirements in 3.3.5 and 3.4.5 do not seem to agree.
Background Information:	In discussion with Mr. Tim Gardner, NBBI Senior Staff Engineer/Instructor Training, he asked why 3.4.5.1 a) does not have the same opening sentence for alterations as exists for repairs in 3.3.5.2. Furthermore, it is recommended for the current 3.3.5.2 sentence to read, "The user shall prepare, or cause to have prepared, detailed specifications covering the scope of the repair/alteration". The reason is to be consistent with the VIII-2/VIII-3 terms and phrases. The user provides the specifications, and the certificate holder then provides the plan.

Proposed Text:

S11.2.3 REPAIR OF ASME SECTION VIII, DIVISION 2 OR 3, PRESSURE VESSELS

a) Scope

The following requirements shall apply for the repair of pressure vessels constructed to the requirements of Section VIII, Division 2 or 3, of the ASME Code.

b) Repair Plan

The user shall prepare, or cause to have prepared, ~~a detailed pla~~detailed specifications~~n~~ covering the scope of the repair.

S11.3.2 ALTERATION OF ASME SECTION VIII, DIVISION 2 OR DIVISION 3, PRESSURE VESSELS

a) Alteration Plan
The user shall prepare, or cause to have prepared, detailed specifications covering the scope of the alteration.

NBIC Action Item A25-25
Submitted by Bob Underwood (robert_underwood@hsb.com)
June 12, 2025

THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

Subject:	Repair of PRIs Without Complete Removal of Defect
NBIC Location:	2025 Part 3, S11.2.2
Statement of Need:	To clarify this repair activity can be used for welded or non-welded repairs. This proposal will remove reference to welded repairs in S11.2.2 and only refer to "repair."
Background Information:	The intent of S11.2.2 (formerly 3.3.4.8) is that this activity be permitted in conjunction with a welded or non-welded repair activity. However, the current wording appears to permit it only when performing a welded repair activity.

Proposed Text:

~~3.3.4.8~~ S11.2.2 REPAIR OF PRESSURE-RETAINING ITEMS WITHOUT COMPLETE REMOVAL OF DEFECTS

a) There may be cases where removal of a defect in a pressure-retaining item is not practical at the time the defect is found. In such cases, with approval of the Inspector and, when required, the Jurisdiction, an engineering evaluation shall be performed to determine the ~~scope of the repair and~~ ~~defects~~ impact to safety of the defects prior to returning the pressure-retaining item to service for a specified period of time. The engineering evaluation shall be performed by an organization with demonstrated competency in defect (and flaw) characterization of pressure-retaining items. The method of defect evaluation and time interval for returning the pressure-retaining item back to service shall be as agreed upon by the Inspector, and when required, the Jurisdiction. The specified period of time the defect can remain in service ~~after weld repair~~ shall be based on no measur~~e~~able defect growth during subsequent inspections, or a period of time as specified by the Jurisdiction, if applicable. This repair method is not permitted for vessels used in lethal service, vessels designed for high-cycle operation or fatigue service, compressed air storage, and in cases where high stress concentration cannot be reduced by an engineered ~~weld~~ repair. This repair method is not permitted for DOT vessels.

b) One or more fitness-for-service engineering evaluation methods as described in NBIC Part 2, 4.4 shall be used to determine whether the defect may remain, either in part or in whole, in the pressure-retaining item. If it is determined that the defect can remain in the item, a risk-based inspection program shall be developed as described in NBIC Part 2, 4.5 to assure inspection of the defect and monitoring of defect growth over time. This program shall be a controlled and documented inspection program that specifies inspection intervals as agreed upon with the

NBIC Action Item A25-25
Submitted by Bob Underwood (robert_underwood@hsb.com)
June 12, 2025

~~b)~~ Inspector and, when required, the Jurisdiction, and shall be maintained until the defect can be completely removed and the item repaired.

c) The following requirements shall apply to the engineered ~~weld~~ repair of pressure-retaining items without complete removal of defects:

1) Engineering evaluation of the defect in the pressure-retaining item shall be conducted using one or more fitness-for-service condition assessment method(s) as described in NBIC Part 2, 4.4. Engineering evaluation of the condition assessment results shall be performed by an organization that has demonstrated industry experience in evaluating pressure-retaining items, if the fitness-for-service engineering evaluation requires finite element analysis (FEA), the requirements in NBIC Part 2, 4.6 and NBIC Part 2, Supplement 11 shall be met.
2) If engineering evaluation indicates a defect can remain in the pressure-retaining item, a risk-based inspection program shall be developed and implemented based on review and acceptance by the Inspector and, when required, the Jurisdiction. The risk-based inspection program shall be in accordance with the requirements in NBIC, Part 2, 4.4.
3) 3) The fitness-for-service condition assessment and risk-based inspection programs shall remain in effect for the pressure-retaining item until such time that the defect can be completely removed and the item repaired. The fitness-for-service condition assessment method, results of assessment, and method of ~~weld~~ repair, if applicable, shall be documented on a Report of Fitness for Service Assessment (FFSA) Form as described in NBIC Part 2, 4.4.1 and shall be filed with the Jurisdiction, when required.
4) 4) When engineered ~~weld~~ repairs are performed without complete removal of the defect(s), this shall be noted on the Form R-1 in the description of the work. The "R" Stamp Holder performing the engineered ~~weld~~ repairs shall provide detailed information on the Form R-1, describing the method, extent, and include the specific location of the engineered ~~weld~~ repair on the item.
5) The interval to re-inspect or remove the item from service or perform ~~weld~~ an engineered repair shall be determined based on a risk-based inspection program developed and implemented as required by NBIC Part 2, 4.5. The inspection interval shall not exceed the remaining life of the item~~,~~ and shall be documented on the Form NB-403 and in the Remarks section of the Form R-1. The Form NB-403 shall be affixed to the Form R-1. A National Board Commissioned Inspector holding an "R" endorsement as described in NB-263, RCI-1 shall sign both the Form R-1 and the attached Form NB-403.
6) A copy of the completed Form R-1 with the completed Form NB-403 attached may be registered with the National Board, and when required, filed with the Jurisdiction where the item was installed.

Definition (Must go to all Parts, 1, 2, 3 and 4)

Engineered Repair – A repair technique defined within NBIC Part 3, Supplement 11. These repairs may be welded or unwelded, all methods of Engineered Repairs require the appropriate Form R Report. Unwelded repairs which are not defined in NBIC Part 3, Supplement 11 do not require a Form R Report.

THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

PROPOSED REVISION OR ADDITION

Item No.

A 25-26 Rev ~~00~~01

Subject/Title

Stamping of Parts and Distribution of Form R-3

NBIC Location

Part 3, Section 5, para. 5.7.4

Project Manager and Task Group

P Gilston & R Underwood

Source (Name/email)

D Kaehn (douglas_kaehn@hsb.com)

Statement of Need

No requirements are given for distribution of Form R-3 unlike those given for Forms R-1 and R-2.

While 3.2.2 c) and d) providing stamping requirements when the Code of construction is ASME or some other Code where stamping requirements are addressed, no instruction are given where this is not provided or the part is fabricated by an R certificate holder who is not using that part themselves in a repair or alteration as addressed in 3.2.2 c)..

Background Information

Revision Notes

Rev 01

5.7.4 b), The word 'marking' changed to 'stamping' per Mr. Collins.

5.7.4 b) f., 'year manufactured' changed to 'year built' per Mr. Khssassi and Mr. Ferreira.

Existing Text	**Proposed Text**
3.2.2 REPLACEMENT PARTS 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. **DISTRIBUTION F FORM R-3**	**3.2.2 REPLACEMENT PARTS** 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. 1) When ~~this is not~~the above requirements are 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

No existing text. **5.7.4 STAMPING REQUIREMENTS FOR PARTS** Stamping or nameplate shall be applied in a conspicuous location on the part.	described in NBIC Part 3, Section 5 paragraphs 5.2.3 and 5.7.4 b) respectively. **5.X DISTRIBUTION OF FORM R-3** a) Legible copies of completed Form R-3, 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. b) Distribution of Form R-3 and attachments shall be the responsibility of the organization manufacturing the part. **5.7.4 STAMPING REQUIREMENTS FOR PARTS** a) For replacement parts subject to internal or external pressure fabricated by welding, stamping shall be as required per paragraph 3.2.2 c) or d). b) For parts fabricated in accordance with 3.2.2 d) 1), the organization who fabricated the part having a National Board "R" Certificate of Authorization, shall stamp the part or attach a nameplate (see Figure 5.7.5-d) in a conspicuous location on the part. The stamping shall include: a. The Certificate Holders name. b. The Manufacturers National Board 'R' Certificate Number c. The "R" symbol stamp. d. The M.A.W.P. at temperature. e. The manufacturers serial number. f. The year built. ~~Stamping or nameplate shall be applied in a conspicuous location on the part.~~

	VOTE						
Committee	**Approved**	**Disapproved**	**Abstained**	**Not Voting**	**Passed**	**Failed**	**Date**

Outlook

R-3 Distribution

From Marty Toth <mtoth@boiscotraininggroup.com>
Date Tue 7/8/2025 12:24 PM
To Terrence Hellman <THellman@nationalboard.org>

There was a lot of discussion that caused me to reconsider my position, without the time to investigate and educate myself. Therefore, I will be abstaining from the item.

Marty Toth
Consultant | Trainer | Principal
ECS Consulting, LLC
and the Boisco Training Group
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THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

PROPOSED REVISION OR ADDITION

Item No.

A 25-28

Subject/Title

Remove reference to FIAs (Federal Inspection Agency).

NBIC Location

Part3; Section 3; Repairs and Alterations – General and Administrative Requirements - 1.3 b) and AIA definition

Project Manager and Task Group

PM - Aziz Khssassi

Source (Name/Email)

Terry Hellman / THellman@nbbi.org & Robert Underwood / robert_underwood@hsb.com

Statement of Need

FIA's are to be a scope under OUIO. Definitions have been removed from RCI-1. This will remove references in the: Introduction; 1.3 b); and in the definition of an Inservice AIA.

Background Information

FIA's are to be a scope under OUIO. Definitions have been removed from RCI-1. This will remove references in the: Introduction; 1.3 b); and in the definition of an Inservice AIA.

Existing Text (2025 Edition)	Proposed Text (08 July 2025)
1.3 INSPECTOR a) Inspection and certification shall be performed by an Inspector holding a National Board Commission with the National Board "R" Endorsement who is employed by an Authorized Inspection Agency in accordance with NB-263, RCI-1, Rules for Commissioned Inspectors. (See NBIC Part 3, Section 9, Glossary of Terms for definition of Authorized Inspection Agency.) b) An Inspector employed by an Owner-User Inspection organization or Federal Inspection Agency may authorize and accept work only on pressure-retaining items owned or used by the respective organization. Each accredited Owner-User Inspection Organization's Quality Management System (QMS) shall have specific approval of the jurisdiction as required. **9.1 DEFINITIONS** **Authorized Inspection Agency (AIA)** **Inservice:** An Authorized Inspection Agency is either: a) a Jurisdictional authority as defined in the National Board Constitution; or b) an entity that is accredited by the National Board meeting NB-369, Accreditation of Authorized Inspection Agencies Performing Inservice Inspection Activities; or NB-371, Accreditation of Owner-User Inspection Organizations (OUIO).; or NB-390, Accreditation of Federal Inspection Agencies (FIA).	**1.3 INSPECTOR** a) Inspection and certification shall be performed by an Inspector holding a National Board Commission with the National Board "R" Endorsement who is employed by an Authorized Inspection Agency in accordance with NB-263, RCI-1, Rules for Commissioned Inspectors. (See NBIC Part 3, Section 9, Glossary of Terms for definition of Authorized Inspection Agency.) b) An Inspector employed by an Owner-User Inspection organization ~~or Federal Inspection Agency~~ may authorize and accept work only on pressure-retaining items owned or used by the respective organization. Each accredited Owner-User Inspection Organization's Quality Management System (QMS) shall have specific approval of the jurisdiction as required. **9.1 DEFINITIONS** **Authorized Inspection Agency (AIA)** **Inservice:** An Authorized Inspection Agency is either: a) a Jurisdictional authority as defined in the National Board Constitution; or b) an entity that is accredited by the National Board meeting NB-369, Accreditation of Authorized Inspection Agencies Performing Inservice Inspection Activities; or NB-371, Accreditation of Owner-User Inspection Organizations (OUIO).~~; or NB-390, Accreditation of Federal Inspection Agencies (FIA).~~

NBIC Action Item A25-42
Submitted by <NAME> (Email)
Submitted on

THE NATIONAL BOARD
OF BOILER AND PRESSURE VESSEL INSPECTORS

Subject:	**Renaming Supplement 11**
NBIC Location:	Part 3, Supplement 11
Statement of Need:	Renaming Supplement 11 to "Advanced Repairs and Alterations"
Background Information:	Removing "Engineered" from the title so as not to suggest that the work would require direct involvement from an engineer or engineering certification. The purpose of the supplement is to provide repairs activities that have been developed with sound engineering judgment backed up with technical references. In some cases, an engineering evaluation will be recommended.

Proposed Text:

SUPPLEMENT 11
~~ENGINEERED~~ ADVANCED REPAIRS AND ALTERATIONS