



**THE
NATIONAL
BOARD**
OF BOILER AND
PRESSURE VESSEL
INSPECTORS

**NATIONAL BOARD
SUBGROUP
REPAIRS AND ALTERATIONS**

MINUTES

Meeting of July 14th, 2020

Louisville, KY

*These minutes are subject to approval and are for the committee use only.
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The National Board of Boiler & Pressure Vessel Inspectors
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1. Call to Order

The meeting was called to order at 8:00 AM by Chair Mr. Brian Boseo.

2. Introduction of Members and Visitors

Introductions took place amongst all members and visitors, and an attendance sheet was filled out by the Secretary ([Attachment 1](#)).

Mr. Eric Cutlip was announced as an alternate for Mr. Ray Miletti on the SubGroup.

3. Check for a Quorum

With the attached roster and the above noted individual, a quorum was established.

4. Awards/Special Recognition

The following individuals were recognized for their service to the Committee and will receive their Award Pin's at the next meeting:

Ms. Kathy Moore – 5 Year Award Pin

Mr. Tom White – 5 Year Award Pin

5. Announcements

Secretary Hellman announced the National Board will be hosting a reception for all committee members and visitors on Wednesday evening at 5:30pm in the Bluegrass Ballroom on the 3rd floor of The Brown Hotel.

6. Adoption of the Agenda

Mr. Hellman listed the following changes to the Agenda:

Added Interp. Item 20-49,

Added Action Items 20-47, 20-48

7. Approval of the Minutes of the January 14th, 2020 Meeting

There was a motion to approve the Minutes of January 14th, 2020 as published. The motion was seconded and unanimously approved.

8. Review of Rosters

a. Membership Nominations

i. The following members were unanimously approved to be appointed to the SG R&A and will be voted on in Subcommittee R&A:

- Mr. Trevor Seime (Jurisdictional Authorities),
- Mr. Scott Chestnut (Users), and
- Mr. Paul Davis (Manufacturers)

ii. Mr. Ray Spuhl (Authorized Inspection Agency) was unanimously approved to be a member of the NR Task Group

b. Membership Reappointments

i. The following Subgroup R&A memberships were unanimously approved to be reappointed and will be voted on in Subcommittee R&A:

- Mr. Brian Boseo,
- Mr. Ben Schaefer, and
- Mr. Rob Troutt.

c. Officer Nominations

- i. Mr. Brian Boseo and Mr. Ben Shaefer were both unanimously approved to be reappointed as Chair and Vice Chair, respectively.

9. Interpretations

Mr. Hellman reminded the Subgroup that Interpretations Items dealing with Part 3 will be worked on at the Interp. Task Group level and reported directly to the Repair and Alterations Subcommittee. Chairman Boseo decided to skip all Interpretation Items except Interpretation Item Number 20-21, which was still having a proposal drafted at the Interp Task Group meeting previously.

a. New Interpretation Requests:

Item Number: 20-21	NBIC Location: Part 3, 4.4.1 e)	Attachment 2
General Description: Combination of NDE methods		
Subgroup: Repairs and Alterations		
Task Group: M. Quisenberry (PM)		
Explanation of Need: Clarification on the intent of 4.4.1 e) 1-5 when using VT and another NDE method but on separate welds.		
Interp TG Meeting Action: J. Siefert presented a Progress Report that he is working on the proposal to revise the Committee’s Q and A and will present his proposal at SG R&A. P. Edwards called to attention Interpretations 17-01 and 01-40 addressing “practicable” as used in 4.2 a) and 4.4 e)1).		
Meeting Action: J. Siefert presented a proposed reply. The reply was revised after discussion to include an “under the line” comment (not published) to refer the inquirer to Interpretation 11-01 and 98-04. The revised proposal was motioned, seconded, and Unanimously Approved.		

10. Action Items

Item Number: NB15-1405	NBIC Location: Part 3, 1.2	Attachment 3
<p>General Description: Impact testing of P-11B Material</p> <p>Subgroup: SG Repairs and Alterations</p> <p>Task Group: P. Davis (PM), G. Galanes, P. Shanks</p> <p>January 2020 Meeting Action: Mr. N. Carter presented his proposal intended to go to Review and Comment Letter Ballot. A motion to send to SG R&A LB for Review and Comment was made, seconded, and unanimously approved.</p> <p>Meeting Action: G. Galanes presented a proposal. The proposal was revised after discussion and a motion was made, seconded, and the revised proposal was Unanimously Approved.</p>		

Item Number: 17-134	NBIC Location: Part 3, Section 5	No Attachment
<p>General Description: Proposed Revision for registration of Form R-1 with the National Board containing ASME pressure part data reports attached.</p> <p>Subgroup: Repairs and Alterations</p> <p>Task Group: P. Shanks (PM), Rob Troutt, Joel Amato, Kathy Moore, Paul Edwards</p> <p>Meeting Action: Mr. P. Shanks presented a Progress Report.</p>		

Item Number: 18-100	NBIC Location: Part 3, 3.3.2	Attachment 4
<p>General Description: Revision adding heat exchanger tubes with an outside diameter of ¾" or smaller to NBIC Part 3.3.2 Routine Repairs</p> <p>Subgroup: Repairs and Alterations</p> <p>Task Group: M. Toth (PM), B. Schaefer</p> <p>January 2020 Meeting Action: Mr. M. Toth was selected as the new PM since Mr. Martinez is no longer on the SG R&A. This was a Progress Report.</p> <p>Meeting Action: Mr. M. Toth presented a Progress Report.</p>		

Item Number: 19-16	NBIC Location: Part 3, 3.3.2 e)	Attachment 5
<p>General Description: Reword to provide clarity; contradictory requirement Part 3; 3.2.2 e)</p> <p>Subgroup: Repairs and Alterations Task Group: T. White</p> <p>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.</p> <p>January 2020 Meeting Action: Mr. P. Davis presented that Item 19-59 may satisfy the inquirer. Item 19-59 was taken out of order and unanimously approved. A motion to respond to the inquirer of Item 19-16 (Eben Creaser) to see if the revision proposal under Item 19-59 satisfies his request for a Code Revision was made, seconded and unanimously approved..</p> <p>Update: Item 19-16 was submitted by Eben Creaser last Feb, and a letter asking if the approval of Item 19-59 satisfied his inquiry was to have been sent out after the Jan. meeting. The NBIC Secretary could not verify if the letter had been sent. An email asking Mr. Creaser if his inquiry was satisfied by the approved Item 19-59 was sent 6/3/2020. If the Mr. Creaser is satisfied, Item 19-16 can be closed with no action. Mr. Creaser responded 7/ 8/2020, stating that the wording proposed is “still a bit ambiguous”. Mr. Creaser submitted proposed new wording that can be seen on the Cloud.</p> <p>Meeting Action: T. White presented a Progress Report.</p>		

Item Number: 19-60	NBIC Location: Part 3, 1.5.1	No Attachment
<p>General Description: Quality System For Qualification For The National Board “R” Certificate</p> <p>Subgroup: Repairs and Alterations Task Group: K. Moore (PM), Paul Davis, B. Boseo, M. Toth, P. Shanks, M. Quisenberry, R. Sturm</p> <p>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.</p> <p>January 2020 Meeting Action: Mr. Boseo commented that Items 19-47 and 19-48 were both closed and the scope for this item expanded to address all elements in 1.5.1. The attached proposal addresses only calibration. New Item 19-82 (Safety Verbiage addition) to be included in this Item’s scope. This was a Progress Report.</p> <p>Meeting Action: Ms. K. Moore presented a Progress Report.</p>		

Item Number: 19-61	NBIC Location: Part 3, 3.3.4	Attachment 6
<p>General Description: Quality System For Qualification For The National Board “R” Certificate</p> <p>Subgroup: Repairs and Alterations</p> <p>Task Group: Paul Shanks (PM), N. Carter, J. Walker, T. McBee</p> <p>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.</p> <p>January 2020 Meeting Action: Mr. P. Shanks presented a Progress Report.</p> <p>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.</p>		

Item Number: 19-68	NBIC Location: Part 3, 1.6	No Attachment
<p>General Description: Review 1.6 requirements for ANI's & ANII's to hold the R endorsement</p> <p>Subgroup: Repairs and Alterations</p> <p>Task Group: B. Wielgoszinski (PM), R. Spuhl, T. Roberts</p> <p>Explanation of Need: Review of 1.6 for possible requirement for ANI's and ANII's to hold the (R) Endorsement for "NR" activities.</p> <p>January 2020 Meeting Action: Mr. P. Edwards presented a Progress Report.</p> <p>Meeting Action: B. Wielgoszinski presented a Progress Report. Mr. R. Spuhl and Mr. T. Roberts volunteered to help work on this item and were added to the Task Group.</p>		

Item Number: 19-82	NBIC Location: Part 3, 1.5.1 j)	Attachment 7
<p>General Description: Review verbiage in Part 3, 5.12.5.1 8) and 5.12.5.1.11)</p> <p>Subgroup: Repairs and Alterations</p> <p>Task Group: M. Quisenberry (PM).</p> <p>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.</p> <p>January 2020 Meeting Action: Mr. M. Quisenberry was selected as the PM and presented this as a Progress Report. The intent is to add this to the scope of current Action Item 19-60 and close this Item with no action at the next meeting.</p> <p>Meeting Action: Mr. M. Quisenberry presented this as a Progress Report.</p>		

New Items:

Item Number: 20-6	NBIC Location: Part 3, Table 2.3	Attachment 8
General Description: Table 2.3 SWPS - Previous Versions accepted		
Subgroup: Repairs and Alterations		
Task Group: J. Sekely (PM)		
Explanation of Need: The use of previous versions of the Designated SWPS is permitted. Previous versions include those reaffirmed, revised, or amended SWPSs regardless of publication date. The AWS reaffirms, amends, or revises SWPSs in accordance with ANSI procedures. This Code addition will simplify the maintenance of Table 2.3.		
Update: This has been approved by the SC, and the Review and Comment ballot raised no concerns from Main Committee.		
Meeting Action: Secretary Hellman presented the original proposal that has been revised to incorporate additional reaffirmation dates and editorial changes to align the NBIC with the actual description verbiage on the SWPS abstracts. The revised/updated proposal is to be voted at SG, SC, and Main Committee. A motion was made, seconded, and the revised proposal was Unanimously Approved .		

Item Number: 20-7	NBIC Location: Part 3, 3.3.2 a)	Attachment 9
General Description: Routine repairs of Div.2 & or Div.3 vessels		
Subgroup: Repairs and Alterations		
Task Group: B. Morelock (PM)		
Explanation of Need: An interpretation is scheduled to be issued under item number 19-26 asserting that Routine repairs are not to be used on Div.2 or Div.3 vessels. rather than require review of an interpretation which may expire in two years the body of the code should make it clear that Routine repairs are not compatible with div.2 or div.3 vessels.		
Meeting Action: B. Morelock presented a proposal. The proposal was revised after discussion and a motion was made, seconded, and the revised proposal was Unanimously Approved .		

Item Number: 20-8	NBIC Location: Part 3, 8.1 b)	No Attachment
<p>General Description: Interpretation revision process</p> <p>Subgroup: Repairs and Alterations</p> <p>Task Group: K. Moore (PM)</p> <p>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.</p> <p>Meeting Action: K. Moore presented that this Item can be closed if the NBIC Introduction is revised to address the use of Interpretations as proposed in this Action Item. This will be considered a Progress Report until the revised Introduction can be reviewed and this Action Item can be closed.</p>		

Item Number: 20-9	NBIC Location: Part 3, 9.1	Attachment 10
<p>General Description: Define "Verify" and "Witness" in the NBIC Glossary</p> <p>Subgroup: Repairs and Alterations</p> <p>Task Group: K. Moore (PM)</p> <p>Explanation of Need: Defining "Verify" and "Witness" in the NBIC Part 1, 2, 3, and 4 to align with the definition in NB-263, RCI-1, Rules for Commissioned Inspectors.</p> <p>Meeting Action: K. Moore presented a proposal. The proposal had been sent to all Subgroups for comment and consideration. Discussion took place regarding the Part 2 Subgroup's proposed revision to this Item to address "remote inspection". The consensus of the Part 3 Subgroup was to use the definition from RCI-1 as originally proposed. A motion was made, seconded, and the original proposal was Unanimously Approved.</p>		

Item Number: 20-10	NBIC Location: Part 3, New Supplement	Attachment 11
<p>General Description: Develop a new Supplement to address rules and roles for FFS</p> <p>Subgroup: Repairs and Alterations</p> <p>Task Group: J. Siefert (PM)</p> <p>Explanation of Need: Currently, the NBIC 3.3.4.8 provides for fitness for service for defects left in a pressure retaining item. It is proposed to develop a new Supplement to provide guidance in how to conduct FFS and roles and responsibilities unique to Part 3 concerning defects.</p> <p>The current FFS form resides in Part 2 and can deal with in-service condition assessment and is loosely tied to defects in Part 3.</p> <p>Meeting Action: J. Siefert presented a proposal. The proposal was revised after discussion and Mr. Siefert stated he intended to open two more Action Items to create a Supplement to address FFSA (Form NB-403) guidance. Part 2 is to be included. A motion was made, seconded, and the revised proposal was Unanimously Approved.</p>		

Item Number: 20-15	NBIC Location: Part 3, 3.3.2 & 5.7.2	Attachment 12
<p>General Description: Stamping requirements for routine repairs</p> <p>Subgroup: Repairs and Alterations</p> <p>Task Group: R. Troutt (PM), K. Moore</p> <p>Explanation of Need: This would offer traceability to the R-Stamp holder responsible for the work.</p> <p>Meeting Action: R. Troutt presented a Progress Report.</p>		

Item Number: 20-16	NBIC Location: Part 3, 3.4.4	Attachment 13
<p>General Description: Rules to address re-cold stretching of vessels built to Appendix 44 rules</p> <p>Subgroup: Repairs and Alterations</p> <p>Task Group: P. Shanks (PM), B. Morelock, W. Sperko</p> <p>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 manufacturer's location) repairs or post construction repairs. However as the NBIC is currently silent this potential issue should be addressed.</p> <p>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.</p>		

Item Number: 20-20	NBIC Location: Part 3, 3.2.2 e)	Attachment 14
<p>General Description: Revision to Part 3, 3.2.2 e)</p> <p>Subgroup: Repairs and Alterations</p> <p>Task Group: P. Davis (PM)</p> <p>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.</p> <p>Meeting Action: P. Davis presented a Progress Report.</p>		
Item Number: 20-28	NBIC Location: Part 3, 2.2.1	Attachment 15
<p>General Description: Qualification of welding procedures by multiple organizations.</p> <p>Subgroup: Repairs and Alterations</p> <p>Task Group: B. Boseo (PM)</p> <p>Explanation of Need: The attached Section IX proposal has been approved for publication by the ASME board. While Section IX provides basis for these tests, it also requires that the ruling Code of Construction expressly permits this activity.</p> <p>Meeting Action: Vice Chair, B. Schaefer was named as acting Chair so Chairman B. Boseo could present a proposal. The proposal was discussed and there were concerns that Section I has not accepted this Section IX proposal, however, the majority of the Subgroup felt that the NBIC should address these qualification of welding procedures by multiple organizations prior to the 2021 edition since these requirements will be in the 2021 edition of Section IX. A motion was made, seconded, and the proposal was Approved with one Abstention (P. Shanks) and two Disapprovals (R. Troutt and K. Moore). The Chair was returned to Mr. Boseo.</p>		
Item Number: 20-47	NBIC Location: Part 1, 2, 3, 4 - 9.1	No Attachment
<p>General Description: Revision of the definition of ANIA in Section 9 of all Parts</p> <p>Subgroup: Repairs and Alterations</p> <p>Task Group: R. Spuhl (PM).</p> <p>Explanation of Need: ANIA can be revised to clarify requirements and activities of AIA's performing NR inspection activities. After discussion of ANI endorsement requirements per Item 19-68, a revision of "ANIA" is being considered as a way to provide clarity on the ANI and ANIA requirements.</p> <p>Meeting Action: R. Spuhl presented a Progress Report.</p>		

Item Number: 20-48	NBIC Location: Part 3, 1.6	No Attachment
General Description: Compare 2015 NQA-1 revision to NR program (1.6) for consistency.		
Subgroup: Repairs and Alterations Task Group: B. Wielgoszinski (PM).		
Explanation of Need: Latest NQA-1 revision to be compared to NR program (1.6) for consistency.		
Meeting Action: B. Wielgoszinski presented a Progress Report .		

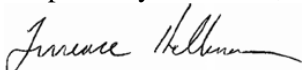
11. Future Meetings

- January 11th – 14th, 2021 – New Orleans, LA
- July 12th – 15th, 2021 – Cincinnati, OH

12. Adjournment

There being no further business before the Task Group, the Chair adjourned the meeting at 3:10 PM, without objection.

Respectfully submitted,



Terrence Hellman
Subgroup R&A Secretary

SG R&A

First Name	Last Name	Interest Category	Role	In Person	WebEx
Brian	Boseo	National Board Certificate Holders	Chair	✓	
Benjamin	Schaefer	National Board Certificate Holders	Vice Chair		✓
Terrence	Hellman		Secretary	✓	
Nathan	Carter	Authorized Inspection Agencies	Member	✓	✓
Craig	Hopkins	National Board Certificate Holders	Member		✓
Frank	Johnson	Users	Member	✓	
Timothy	McBee	Authorized Inspection Agencies	Member	✓	
Ray <i>(BTL)</i>	Mileti <i>(with)</i>	Manufacturers	Member		✓
Kathy	Moore	National Board Certificate Holders	Member		✓
Brian	Morelock	Users	Member		✓
Michael	Quisenberry	National Board Certificate Holders	Member	✓	
James	Sekely	General Interest	Member		✓
Paul	Shanks	Authorized Inspection Agencies	Member		✓
John	Siefert	General Interest	Member		✓
Walter	Sperko	General Interest	Member		✓
Rick	Sturm	Jurisdictional Authorities	Member		
Marty	Toth	General Interest	Member	✓	
Robby	Troutt	Jurisdictional Authorities	Member		✓
Robert	Underwood	Authorized Inspection Agencies	Member	✓	
<i>Pat</i>	<i>Becker</i>		Visitor		✓

Scott	Chestnut		Visitor		✓
Paul	Edwards		Visitor	✓	
Eric	Cutlip	For Roy Miletti	Visitor		✓
Don	Kenny		Visitor		✓
George	Galanes		Visitor		✓
Bonnie	Walker		Visitor		✓
Lynn	Moedryer		Visitor		✓
Philip	Gilston		Visitor		✓
Rick	Valdez		Visitor		✓
Walt	Lucy		Visitor		✓
Bob	W. Leperska		Visitor	✓	
M. A.	Shah	AMB Industrial Services Inc	Visitor		✓
Marty	Sims		Visitor		✓
Traver	Sreme		Visitor	✓	
Tim	McBee		Visitor	✓	
Tim	Le Beau		Visitor		✓
Robert	McGuire		Visitor		✓
Aziz			Visitor		✓
Down	Walt	B&W	Visitor		
			Visitor		
			Visitor		
			Visitor		

PROPOSED INTERPRETATION

Inquiry No.	20-21
Source	Eric Feeney, TEI Construction Services efeeney@teiservices.com
Subject	Nondestructive Examination Background: When a boiler outage is being performed, there may be 50-10,000+ welds made. We are accustomed to performing 100% volumetric examination when a hydrostatic test is not being performed. Some of our inspectors suggest that we can perform a portion of the NDE as volumetric and the remainder as VT. When I read 4.4.1 e) it seems to have validity, but I generally have understood paragraph e) to have been referring to each individual weld and not the repair as a whole. This is what I would like clarification on.
Edition	2019; Part: Repairs and Alterations; Section: 4; Paragraph: 4.4.1 e)
Question	Question: May a portion of a repair be subject to NDE other than visual, and the remainder of the repair be subject to exclusive use of VT in accordance with Part 3, 4.4.1 e)?
Reply	Proposed Reply: Yes.
Committee's Question	Question: Routine weld repairs are being performed to pressure retaining parts of an ASME B&PV Code Section I boiler. May exclusive use of VT be performed in accordance with Part 3, 4.4.1 e) when pressure testing or alternative NDE methods other than visual examination, are not practicable-?
Committee's Reply	Proposed Reply: Yes <u>No, except as permitted for Routine Repairs.</u>
Rationale	NBIC Part 3, 4.2 a) specifically limits substitution of alternative NDE methods to situations where NDE to the original code of construction is not possible or practicable. The inquirer is referred to Interpretation 17-01 regarding clarification of the term 'practicable.' NBIC Part 3, 4.4.1 e) 1) specifically limits any substitution of NDE with VT to routine repairs. Routine repairs are defined in NBIC Part 3, 3.3.2 e). NBIC Part 3, nor the original Code of Construction, specify the number or type of preferred NDE that must be performed for a weld repair. This is a contractual agreement that is outside the scope of NBIC Part 3.

Relevant Background

4.2 NONDESTRUCTIVE EXAMINATION

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

4.4.1 TEST OR EXAMINATION METHODS APPLICABLE TO REPAIRS (19)

Based on the nature and scope of the repair activity, one or a combination of the following examination and test methods shall be applied to repairs and replacement parts used in repairs.

e) Nondestructive Examination (NDE)

NDE may be conducted. NDE methods used shall be suitable for providing meaningful results to verify the integrity of the repair. Exclusive use of visual examination (VT) is only permitted with the following considerations:

- 1) When a pressure test or alternative NDE methods other than visual examination, are not practicable the exclusive use of direct VT as an NDE method shall be limited to routine repairs, as identified in NBIC Part 3, 3.3.2.
- 2) For each repair being considered, the exclusive use of direct VT as an NDE method shall be acceptable to the Inspector, and where required, the Jurisdiction.
- 3) As a minimum, direct VT shall be performed after the root weld layer or first-pass is deposited, and the final weld surface. Other weld layers shall be examined as identified by the Inspector and, where required, the Jurisdiction.
- 4) Personnel completing direct VT shall be qualified and certified in accordance with paragraph NBIC Part 3, 4.2- b), AWS QC-1, or any nationally recognized standard acceptable to the Jurisdiction. Visual acuity shall be demonstrated using as a minimum, standard J-2 letters on standard Jaeger test type charts for near vision.
- 5) Direct VT shall be performed in accordance with a written procedure meeting the procedure and reporting requirements listed in the original code of construction or ASME Section V, Article 9.

Part 3, Section 9, Glossary of Terms

Repair — The work necessary to restore pressure-retaining items to a safe and satisfactory operating condition. (Would seem to imply that 'repair' can include one or more welds repairs)

INTERPRETATION 01-40

Subject: RC-2051(e), RC-3031(c), RC-2050, RC-3030(c)
2001 Edition with 2003 Addendum

Question: If pressure testing is not practicable and if concurrence of the owner, Inspector and jurisdiction is obtained where applicable, may the Visual Testing (VT) NDE method be used to satisfy the NBIC requirement?

Reply: Yes.

INTERPRETATION 17-01

Subject: Application of Term "Practicable"

Edition: 2017

Question: May the desire to save time and/or expense be used solely in determining if a repair and/or alteration activity is practicable?

Reply: No. The determination of "practicable" shall be based on technical consideration of the nature and scope of repair and/or alteration activities.

Item #: NB15-1405

Revision: 1

Date: January 14, 2020

Subject: Clarification of Impact Testing Rules for Repairs

Justification:

This revision was generated to address an interpretation asking whether production impact test plates were required for repair of vessels made from P-No 11B materials, when no extra material from one of the heats exist. Where extra material does not exist from one of the heats, the original code of construction would require existing material from the vessel to be used. This would require the vessel to be further damaged with material being cut out to serve as a test plate.

Initially this interpretation was meant to address only P-No 11B material; however, this same problem exists for all vessel materials. As a result, the following proposal was generated.

INSERT NEW PARAGRAPHS:

3.3.6 Pressure Vessel Impact Testing

3.3.6.1 Welding procedures used for repairs shall be qualified with impact testing when required by the original code of construction. The requirements for impact testing shall be in accordance with the rules of the original code of construction except that vessel (production) impact testing is not required.

3.3.6.2 The test material for the welding procedure qualification with impact testing shall be of the same P-number and Group number, and heat-treated condition as the material being repaired.

a) In the event that the notch toughness of the material to be repaired is unknown, evidence from tests of that material or from another acceptable source (see NBIC Part 3, 2.5.3) may be used for the base metal notch toughness when qualifying the WPS as required in NBIC Part 3, 2.5.3.2 h).

b) In the event that the original material specification is obsolete, the test material used should conform as closely as possible to the original material used for construction based on nominal composition and carbon equivalent (IIW Formula $CE = C + Mn/6 + (Cr$

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+ Mo + V)/5 + (Ni + Cu)/15; elements are expressed in Weight Percent Amounts), and heat-treated condition, but in no case shall the material be lower in strength.

Background for Interpretation 18-100

Task Group PM – David Martinez;

Task Group members: Marty Russel and Nathan Carter

Item Number: 18-100 NBIC Location: Part 3, 3.3.2 Attachment Page 44

General Description: Revision adding (plugging) heat exchanger tubes with an outside diameter of $\frac{3}{4}$ " or smaller to NBIC Part 3.3.2 Routine Repairs

Subgroup: Repairs and Alterations

Task Group: David Martinez (PM)

January 2019 Meeting Action: Progress Report: Mr. Martinez reported on this item and presented interpretations (98-04 and 98-29) that may satisfy the revision request, however after a presentation from TEiC regarding the use of explosive welding of tubes to be considered as a routine repair, Mr. Martinez recommend this be considered progress report to continue working to address explosive welding as a Routine Repair.

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 the Jurisdiction where the pressure-retaining item is installed;
- 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. Routine repairs shall be documented on Form R-1 with this statement in the Remarks section: "Routine Repair";
- d) Alternative welding methods without postweld heat treatment as described in NBIC Part 3, 2.5.3 shall not be used for routine repairs.

(Example of proposed additional category to examples of Routine Repairs – paragraph e)

- e) The following repairs may be considered as routine repairs and shall be limited to these categories:
 - 1) Welded repairs or replacements of valves, fittings, tubes, or pipes NPS 5 (DN 125) in diameter and smaller, or sections thereof, where neither postweld heat treatment nor

NDE other than visual is required by the original code of construction. This includes their attachments such as clips, lugs, skirts, etc., but does not include nozzles to pressure-retaining items;

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

3) Weld buildup of wasted areas in heads, shells, flanges and fittings not exceeding an area of 100 in.2 (64,520 mm²) or a thickness of 25% of nominal wall thickness or 1/2 in. (13 mm), whichever is less;

4) Corrosion resistance weld overlay not exceeding 100 in.2 (64,520 mm²); ~~and~~

5) Seal welding a mechanical connection for leak tightness where by-design, the pressure retaining capability is not dependent on the weld for strength and requires no postweld heat treatment; and

6) Plugging of heat exchanger tubes 3/4 in. outside diameter and smaller when explosive plugging is used as method of plugging tubes.

Background Interpretation

INTERPRETATION 15-04

Subject: Part 3, Section 3

Edition: 2015

Question: Is explosion welding of plugs into leaking heat exchanger tubes considered a repair per the NBIC Part 3?

Reply: Yes.

Support for Consideration of the Proposed Action

ASME Section IX – 2019 (Addresses Procedure and Performance Qualification for Explosion Welding heat exchanger tubes to tubesheets, but not the plug to the tube)

QW-193 TUBE-TO-TUBESHEET TESTS

When the applicable Code Section requires the use of this paragraph for tube-to-tubesheet demonstration mockup qualification, [QW-193.1](#) through [QW-193.1.3](#) shall apply.

QW-193.1 Procedure Qualification Specimens. Ten mockup welds are required for qualifying each tube-to-tubesheet welding procedure. The mockup assembly shall essentially duplicate the tube-to-tubesheet weld joint design to be used in production, within the limits of the essential variables of QW-288. The mockup test assembly shall be prepared with the tubesheet element having a thickness not less than the lesser of the thickness of the production tubesheet or 2 in. (50 mm). For tube-to-tubesheet welds to clad tubesheets, the cladding or overlay may be represented by a base material with a chemical composition that is essentially equivalent to the cladding composition. All welds in the mockup assembly shall be subjected to the following tests and shall meet the applicable acceptance criteria.

QW-193.1.1 Visual Examination. The accessible surfaces of the welds shall be examined visually with no magnification required. The welds shall show complete fusion, be free from visual cracks or porosity indications, and have no evidence of burning through the tube wall.

QW-193.1.2 Liquid Penetrant. The liquid penetrant examination shall meet the requirements of Section V, Article 6. The weld surfaces shall meet the requirements of QW-195.2.

QW-193.1.3 Macro-Examination. The mockup welds shall be sectioned through the center of the tube for macro-examination. The four exposed surfaces shall be smoothed and etched with a suitable etchant (see QW-470) to give a clear definition of the weld and heat-affected zone. Using a magnification of 10X to 20X, the exposed cross sections of the weld shall confirm

- (a) minimum leak path dimension required by the design
- (b) no cracking
- (c) complete fusion of the weld deposit into the tubesheet and tube wall face

**Table QW-288.2
Essential Variables for Procedure
Qualification of Tube-to-Tubesheet Welding
(Explosion Welding)**

Paragraph	Brief of Variables
QW-403 Base Metals	.35 ϕ Tube thickness
QW-410 Technique	.82 ϕ Pressure application
	.83 ϕ Explosive
	.84 ϕ Distance charge to tubesheet
	.85 ϕ Specified clearance

Legend:
 ϕ Change

QW-410.83 A change in the type of explosive or a change in the energy content greater than $\pm 10\%$.

QW-410.84 A change in the distance between the explosive charge and the tubesheet face greater than $\pm 10\%$.

QW-410.85 A change in the specified clearance between the tube and the tubesheet greater than $\pm 10\%$.

QW-193.2 Performance Qualification Specimens.

A minimum of five mockup tube-to-tubesheet welds are required to qualify each welder or welding operator. The same rules as those applicable for procedure qualification (QW-193.1) shall be followed, with the following additional requirements and exceptions:

- (a) The essential variables in QW-387 shall apply.
- (b) Essential performance qualification variables applicable for each welding process listed in QW-350 or QW-360 shall also be observed in addition to the variables of Table QW-388.
- (c) Postweld heat treatment may be omitted.

Only one mockup weld is required to renew a welder's or welding operator's qualification when that qualification has expired or has been revoked per the requirements of QW-322.1.

Logic to consider motion for approval:

- Explosion welding to plug leaking tubes is supported by qualified written welding procedures and welder qualification procedures compared to other mechanical tube-plugging methods that are performed with no NBIC guidance.
- Explosion welding does not rely on fusion to join the two materials. It is a pressure weld in which the explosive force joins the two materials. Unlike fusion welding that is allowed in other examples of Routine Repairs, there is no heat affected zone, and PWHT is not needed nor required.
- The majority, if not all explosion tube plugging is performed on tubes $\frac{3}{4}$ " and smaller, and typically under emergency conditions. No Inspector involvement would be required if this specific category was added to the categories of Routine Repairs
- The explosion tube-plugging method for tubes $\frac{3}{4}$ " and smaller would be more cost and schedule effective and is proven to be a reliable method for plugging leaking heat exchanger tubes for owners and users.

Note: The only realistic test upon completion of explosion tube-plugging is a pressure test.

Item 19-16: NBIC Part 3, 3.2.2 e)
Submitted by: Eben Creaser eben.creaser@gnb.ca

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 save money by having the fabricator not Hydro test as per Section I even when it was not impractical to have the testing performed.

Background Information: The second sentence of 3.2.2 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 alludes to an optional requirement, it's just not clear.

Proposed Text:

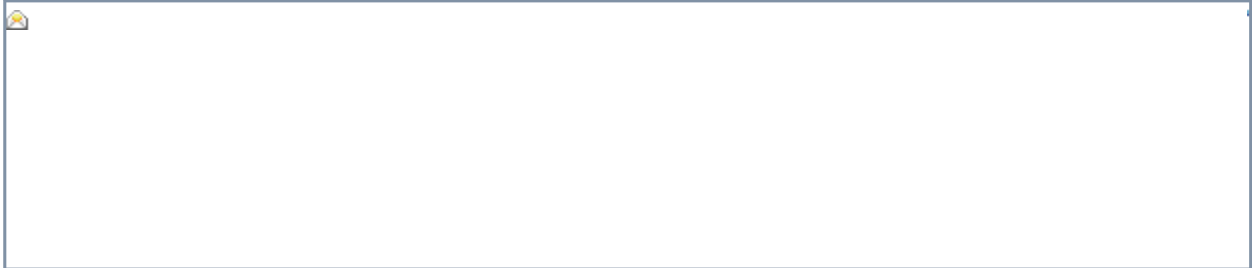
If the intent of this clause is to provide optional pressure test requirements for parts then;

- 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 prior to installation, or, when accepted by the owner, the Inspector and, where required, the Jurisdiction, parts. ~~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.



Fw: Rewording of Part 3 - 3.2.2 e)
Jonathan Ellis to: Terrence Hellman

07/08/2020 01:28 PM



Hi Terry,

Heard back from Eben regarding 19-16. His response is below.

Jonathan Ellis
Staff Engineer
Phone: 614-431-3236
Email: jellis@nationalboard.org



The National Board of Boiler & Pressure Vessel Inspectors
1055 Crupper Avenue
Columbus, OH 43229
www.nationalboard.org

----- Forwarded by Jonathan Ellis/NationalBoard on 07/08/2020 01:27 PM -----

From: "Eben Creaser" <eben.creaser@gmail.com>
To: jellis@nationalboard.org
Date: 07/08/2020 01:24 PM
Subject: Rewording of Part 3 - 3.2.2 e)

Jonathan,

Thanks for your diligence on this and taking the time to re-familiarize me with the issue at hand. I took a lot at the wording the committee came up with and although it will address the issue raised in my opinion the wording is still a bit ambiguous. I took a run at providing some additional clarity and would appreciate you passing it along to those involved in the wording of this clause.

e) Replacement parts addressed by 3.2.2 c) or d) above shall receive a pressure test. The test pressure applied shall be the same as that determined for the completed pressure equipment (boiler, pressure vessel, etc.) in accordance with the original code of construction. The required pressure test may be performed prior installing the replacement part or at any other time prior to placing the repaired or altered pressure retaining item back in service and signing the R Form. Where pressure testing of a replacement part can not be performed due to a technically justifiable reason the omission of the required pressure test shall be subject to the approval of the owner, and acceptance of the Inspector and, when

required, the Jurisdiction. 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) shall be used in when the required pressure test has not been performed.

The R Certificate Holder responsible for completing the R Form shall note in the Remarks section of the R Form any examination(s) and test(s) performed in lieu of the required pressure test and the reason use to justify the elimination of the pressure test.

*Best Regards,
Eben Creaser*

Item 19-61: Request for Revision to NBIC Part 3, 1.5.1 j)

Paul Shanks

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Purpose	Include a method in the NBIC for safely returning a PRI with damaged female thread to service
Scope:	Part: Repairs and Alterations; Section: 3.3.2 e)
Background:	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.
Proposed Revision:	Add an example of a routine repair which is repairing a female thread per ASME PCC-2 Article 303. See below underlined text.

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 the Jurisdiction where the pressure-retaining item is installed;
- 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. Routine repairs shall be documented on Form R-1 with this statement in the Remarks section: "Routine Repair";
- d) Alternative welding methods without postweld heat treatment as described in NBIC Part 3, 2.5.3 shall not be used for routine repairs.
- e) The following repairs may be considered as routine repairs and shall be limited to these categories:
- 1) Welded repairs or replacements of valves, fittings, tubes, or pipes NPS 5 (DN 125) in diameter and smaller, or sections thereof, where neither postweld heat treatment nor NDE other than visual is required by the original code of construction. This includes their attachments such as clips, lugs, skirts, etc., but does not include nozzles to pressure-retaining items;
 - 2) The addition or repair of nonload bearing attachments to pressure-retaining items where postweld heat treatment is not required;
 - 3) Weld buildup of wasted areas in heads, shells, flanges and fittings not exceeding an area of 100 in.² (64,520 mm²) or a thickness of 25% of nominal wall thickness or 1/2 in. (13 mm), whichever is less;
 - 4) Corrosion resistance weld overlay not exceeding 100 in.² (64,520 mm²); and

5) Seal welding a mechanical connection for leak tightness where by-design, the pressure retaining capability is not dependent on the weld for strength and requires no postweld heat treatment.

6) Repairing a female thread form via any method as described in 3.3.4.10

Insert new paragraph

3.3.4.10 Restoring Female Threads

When female threaded hole(s) become damaged the following methods may be used to restore those threads and allow continued safe service

a) Drilling and tapping the existing stud hole(s) to a larger size, and replacing the existing size bolt/stud with one sized accordingly- the use of this method may require custom stud(s) that have different thread sizes at each end this requires a change in diameter which shall be achieved with a minimum 3:1 taper. Stud material shall be the same as the other bolts/studs.

b) Filling the hole with weld metal using a suitably qualified welding procedure, re-drilling, and re-tapping the hole(s) with the original thread size. The existing (damaged) thread(s) shall be removed such that weld metal is deposited on sound base material.

c) Drilling and tapping the existing hole(s) to a larger size, for the purpose of installing helical coil threaded insert. Helical coil thread inserts are generally available up to 1-1/2" Unified Coarse Series (UNC). The application and installation of helical coil threaded inserts shall be per the helical coil manufacturer's recommendations. Particularly attention shall be given to service conditions (internal, external), materials, and loadings. ASME B18.29.1 provides additional information if required. Helical coil threaded inserts shall satisfy the design requirements of the original construction code for the loading to be applied to the threaded connection. Typically the design of the helical coil insert requires balancing the tensile strength of the bolt/stud material against the shear strength of the component base material. Materials not listed in the original construction code are not acceptable.

Rational

The NBIC rules are inevitably written with a background knowledge of the ASME codes of construction, PCC-2 which is already included in NBIC Part 3 as a reference standard (Para 3.2.6 c)) is the ASME approach to repairing pressure equipment and is composed by the same people that write the rules for new construction. Given that this reference standard has already composed guidance and rules addressing the repair of damaged threads the NBIC should make use of these rules to prevent potential dangerous repairs being done by those with good intentions but with the correct knowledge of pressure equipment safety.

Article 303

Damaged Threads in Tapped Holes

303-1 DESCRIPTION

303-1.1 Introduction

The design requirements of equipment such as vessels, machinery, valves, instruments, etc., where close coupling is required because of operational, economic, or space considerations, often dictate the use of tapped holes; usually with a stud, but sometimes with a cap screw. When a stud is used, the stud is engaged within a drilled and tapped hole at one end and secured with a nut at the other end. The threads in the tapped hole often have a tighter fit with the stud than do the threads in the nut. The tighter fit usually is specified, and the stud is usually bottomed in the tapped hole, to facilitate removing the nut from the stud without removing the stud from the tapped hole. Threads in tapped holes often are damaged when studs are removed after a period of service.

303-1.2 Methods of Repair — Alternatives

This Article is intended to cover the repair of damaged threads in tapped blind holes in studded connections by one of the following methods:

- (a) drilling and tapping the existing stud holes to a larger size, and replacing the existing size fastener with one sized accordingly
- (b) drilling and tapping the existing stud holes to a larger size, for the purpose of installing helical-coil threaded inserts
- (c) filling the existing stud holes with weld metal, redrilling, and retapping the holes

303-1.3 Repair Methods Not Covered

Other methods that may be considered for repair of damaged threads, but are not covered in this Article, include the following:

- (a) retapping the existing stud holes with the same size tap (also referred to as “chasing” the threads)
- (b) replacement of the component containing the tapped holes

NOTE: Most of the guidelines in this Article are intended for repair of damaged threads in tapped blind holes, as would be found in studded connections. While this Article does not specifically exclude applications such as holes that extend completely through the pressure component, the user is cautioned

that many of the requirements herein may not be applicable or sufficient to cover those cases.

303-2 LIMITATIONS

303-2.1 Additional Requirements

Part 1 of this Standard contains additional requirements and limitations. This Article shall be used in conjunction with Part 1.

303-2.2 Retapping Existing Holes

Unless visual examination of the threads in the stud hole indicates substantial damage to the threads, it is sometimes advantageous to attempt to retap the holes using the same size tap, a process known as “chasing” the threads. Sometimes the only problem is that corrosion products and/or residue from the process plugged the threads.

303-2.3 Design Adequacy of Enlarging Stud Holes

Enlargement of existing stud holes shall not be done until an engineering analysis confirms the design adequacy of the proposed assembly (see section 303-3).

303-2.4 Repair of Cracks

If an examination of the stud holes reveals cracks at the face of the hole opening (see section 303-5), those cracks shall be repaired prior to enlargement of existing stud holes, if the enlarged hole size is not sufficient to remove the cracks.

303-2.5 Welding and Material Considerations

If repairs involve welding, with or without postweld heat treatment, the potential exists for warpage of the assembly and possible leakage. For some materials (such as low alloy steels), subsequent postweld heat treatment operations may adversely affect the material toughness. Also, consideration shall be given to the potential for cracking of materials that may have experienced temper embrittlement. In these situations, either a welding or materials specialist, or both, should be consulted prior to commencing repairs.

ASME PCC-2-2018

303-2.6 Helical Coil Thread Inserts

Helical coil thread inserts are generally available up to 1½ Unified Coarse Series (UNC). The application of helical-coil threaded inserts shall be per the manufacturer's recommendations, particularly with respect to service conditions (internal, external), materials, and loadings. ASME B18.29.1 provides additional information.

303-3 DESIGN**303-3.1 Applicable Codes**

Upon completion of the repair, the design of the bolted assembly shall be in accordance with the original construction code or applicable post-construction code.

303-3.2 Thread Modification

A standard taper tap will produce incomplete tapped threads near the bottom of the tapped hole; even the use of a bottoming tap will not ensure a complete final thread. As a consequence, bottoming a fully threaded stud into a tapped hole that has incomplete threads near the bottom damages the full threads on the end of the stud. This almost ensures that the full threads in the tapped hole will be damaged as the stud with damaged threads is backed out. A practice that has been used successfully to prevent this from occurring is to remove some of the threads from the studs and to increase the depth of the tapped holes accordingly. A sketch with suggested dimensions is provided in Mandatory Appendix 303-I.

303-3.3 Enlargement of Existing Holes

The design considerations specified in paras. 303-3.3.1 through 303-3.3.3 are applicable to repair of damaged threads by enlarging the tapped hole diameter.

303-3.3.1 Check of Thread Engagement. Before enlarging the tapped hole diameter, the length of thread engagement shall be rechecked to ensure compliance with the requirements of the original construction code [e.g., ASME BPVC, Section VIII, Division 1, UG-43 (g); ASME BPVC, Section VIII, Division 2, AD-740; or ASME BPVC, Section VIII, Division 3, KD-615(b)] or applicable post-construction code.

NOTE: If the parts under consideration are not governed by the rules of the ASME Code, another applicable construction code or post-construction code, the design may refer to ASME B1.1 (Nonmandatory Appendix B, Thread Strength Design Formulas).

303-3.3.2 Check of Flange Stresses. If the fastener diameter is increased, the flange stresses (including the untapped mating flange/cover) shall be rechecked to see if they remain within acceptable levels, given the potential for increased loads generated by the larger fastener diameter. This should include considera-

tion of increased bolt preload due to the larger fasteners on flange stresses due to bolt up.

303-3.3.3 Tapered Studs. In some applications, it may be possible to replace the existing studs with a custom "tapered" stud (see Figure 303-3.3.3-1 for an example), where one end of the stud retains its original diameter while the other end is enlarged. This maintains the design bolt loads consistent with the original design, avoids the need to drill larger holes in the mating flange/cover, and permits the possible reuse of the nuts.

303-3.4 Hole Enlargement Implications on Design

When the existing tapped hole is drilled to a larger diameter, material is removed from the component containing the hole. The design shall consider the implications associated with this repair method to ensure that the remaining material provides sufficient strength to satisfy the intended design conditions. Mandatory Appendix 303-II offers an example of a check made to a studded outlet connection in a pressure vessel.

303-3.5 Design of Helical Coil Thread Inserts

Helical-coil threaded inserts shall satisfy the design requirements of the original construction code or applicable post-construction code for the specified loading to be applied to the threaded connection. In general, the design is based on balancing the tensile strength of the stud material against the shear strength of the component base material. For materials not listed in the original construction code or applicable post-construction code, primary stresses should not exceed the lesser of $\frac{2}{3}$ of the minimum specified yield strength or $\frac{1}{3.5}$ of the minimum specified tensile strength of the applicable material.

303-4 FABRICATION**303-4.1 Hole Depth of Penetration**

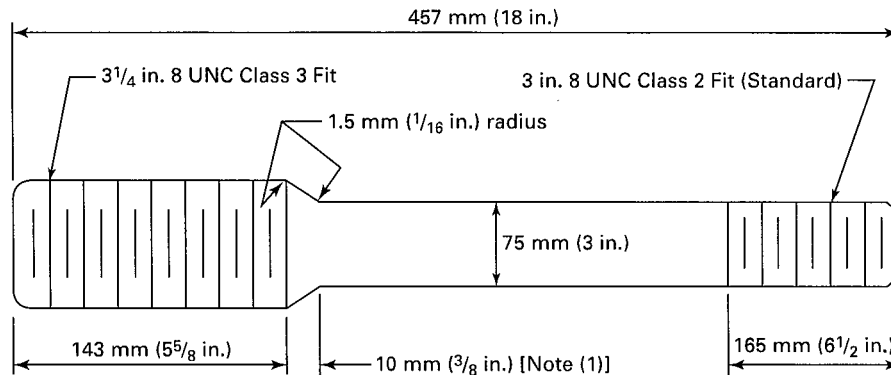
Drilled holes to be tapped shall not exceed the maximum depth of penetration through the thickness of the pressure component, as defined by the original construction code [e.g., ASME BPVC, Section VIII, Division 1, UG-43(d) or ASME BPVC, Section VIII, Division 2, AD-630], or applicable post-construction code.

303-4.2 Hole Preparation Before Welding

If the damaged threads are repaired by filling the existing stud holes with weld metal, the holes shall be free of debris and the existing threads removed (usually done by drilling out) to ensure that the new weld deposit does not include this material.

ASME PCC-2-2018

Figure 303-3.3.3-1 Example of Tapered Stud



NOTE: (1) For other sizes, as needed to attain a 3:1 taper.

303-4.3 Welding Procedures and Qualifications

Welding procedures, welders, or welding operators, where used, shall be qualified in accordance with the original construction code or applicable post-construction code.

303-4.4 Welding and Material Considerations

Any special welding requirements, including preheat or postweld heat treatment, shall be in accordance with the original construction code or applicable post-construction code. Because of the potential for warpage of the component, a welding/materials specialist should be consulted regarding procedures/processes, preheat, and postweld heat treatment.

303-4.5 Flange Refinishing

If the gasket contact surface has been warped as a result of weld repairs or heat treatment, it may require refinishing (see Article 305).

303-4.6 Installation of Helical Coil Thread Inserts

When helical-coil threaded inserts are used, they shall be installed in accordance with the manufacturer's instructions.

303-4.7 Thread Galling and Lubrication

Special attention should be given to prevent thread galling after assembly. In addition, lubricant should be applied to the bolt thread surface in accordance with ASME PCC-1, section 7.

303-5 EXAMINATION

303-5.1 Visual Examination

Drilled holes shall be visually examined for workmanship, cleanliness, and evidence of cracking.

303-5.2 Need for Additional NDE

Where material deterioration or damage is suspected, additional nondestructive examination shall be considered.

303-5.3 Examination Procedures

Examination procedures shall be in accordance with the original construction code or applicable post-construction code.

303-6 TESTING

Testing requirements associated with modification of the flange assembly shall be in accordance with the applicable post-construction code.

303-7 REFERENCES

(18)

The following is a list of publications referenced in this Article.

- ASME B1.1-2003, Unified Inch Screw Threads (UN and UNR Thread Form)
- ASME B18.29.1-1993, Helical Coil Screw Thread Inserts — Free Running and Screw Locking (Inch Series), including Errata issued August 1995
- ASME Boiler and Pressure Vessel Code, 2007 Edition: Section VIII, Division 1 — Rules for Construction of Pressure Vessels; Section VIII, Division 2 — Alternative Rules; Section VIII, Division 3 — Alternative Rules for Construction of High Pressure Vessels
- ASME PCC-1-2000, Guidelines for Pressure Boundary Bolted Flange Joint Assembly
- Publisher: The American Society of Mechanical Engineers (ASME), Two Park Avenue, New York, NY 10016-5990 (www.asme.org)

Item 19-82: Request for Revision to NBIC Part 3, 1.5.1 j)

Terrence Hellman
National Board
thellman@nationalboard.org
614-431-3234

Purpose	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.
Scope:	Part: Repairs and Alterations; Section: 1.5.1; Paragraph: 1.5.1 j)
Background:	Safety concerns from confined space issues, to flammable or volatile vessel contents should be addressed in Part 3 to ensure that welders, Inspectors, and other personnel are not put at unnecessary risk during Repair/Alteration activity.
Proposed Revision:	See below for the proposed revision

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

h) Repair and Alteration Methods

The manual shall include controls for repairs and alterations, including mechanical assembly procedures, materials, nondestructive examination methods, pre-heat, and postweld heat treatment, as applicable. Special requirements such as nonmetallic repairs and alterations to graphite and fiber-reinforced thermosetting plastic pressure-retaining items including bonding or mechanical assembly procedures shall be addressed, if applicable.

i) Materials

The manual shall describe the method used to ensure that only acceptable materials (including welding material) are used for repairs and alterations. The manual shall include a description of how existing material is identified and new material is ordered, verified, and identified. The 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.

j) Method of Performing Work

The 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. The manual shall include provisions to ensure safe working conditions during welding, testing, and all activities related to repairs or alterations.

k) Welding, NDE and Heat Treatment

The manual shall describe controls for welding, nondestructive examination (NDE), and heat treatment. The manual is to indicate the title of the individual(s) responsible for the welding procedure specification (WPS) and its qualification, and the qualification of welders and welding

ITEM 20-06: Update Clause 2.3 and Table 2.3

2.3 STANDARD WELDING PROCEDURE SPECIFICATIONS (SWPSs)

a) One or more SWPSs from NBIC Part 3, Table 2.3 may be used as an alternative to one or more WPS documents qualified by the organization making the repair or alteration, provided the organization accepts by certification (contained therein) full responsibility for the application of the SWPS in conformance with the Application as stated in the SWPS. When using SWPSs, all variables listed on the Standard Welding Procedure are considered essential and, therefore, the repair organization cannot deviate, modify, amend, or revise any SWPS. US Customary Units or metric units may be used for all SWPSs in NBIC Part 3, Table 2.3, but one system shall be used for application of the entire SWPS in accordance with the metric conversion 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) 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 versions of the listed SWPSs is permitted. Previous versions include Reaffirmed, Amended, or Revised SWPSs regardless of the publication date

ITEM 20-06: Update Clause 2.3 and Table 2.3

TABLE 2.3**CARBON STEEL- (P1/M1 MATERIAL)**

SMAW — Shielded Metal Arc Welding	
TITLE	DESIGNATION: YEAR
Standard Welding Procedure Specification for Shielded Metal Arc Welding of Carbon Steel, (M-1/P-1, Group 1 or 2), 3/16 in. <u>(5 mm)</u> through 3/4 in. <u>(19 mm) Thick</u> , As-Welded Condition, With Backing, Primarily Plate and Structural Applications.	B2.1-1-001: 2018 <u>2020</u>
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. <u>(3 mm)</u> through 1 ½ in. <u>(38 mm) Thick</u> , E7018, As-Welded or PWHT Condition, Primarily Plate and Structural Applications.	B2.1-1-016: 2018
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. <u>(3 mm)</u> through 1 ½ in. <u>(38 mm) Thick</u> , E6010, As-Welded or PWHT Condition, Primarily Plate and Structural Applications.	B2.1-1-017: 2018
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. <u>(3 mm)</u> through 1 ½ in. <u>(38 mm) Thick</u> , E6010 (Vertical Uphill) followed by E7018, As-Welded or PWHT Condition, Primarily Plate and Structural Applications.	B2.1-1-022: 2018
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. <u>(3 mm)</u> through 1 ½ in. <u>(38 mm) Thick</u> , E6010 (Vertical Downhill) followed by E7018, As-Welded or PWHT Condition, Primarily Plate and Structural Applications.	B2.1-1-026: 2018
Standard Welding Procedure Specification for Shielded Metal Arc Welding of Carbon Steel (M-1/P-1, Group 1 or 2), 1/8 in. (3mm) through 3/4 in. (19 mm) Thick, E6010 (Vertical Uphill) followed by E7018, (Vertical Uphill) in the As-Welded Condition, Primarily Pipe Applications.	B2.1-1-201: 2019
Standard Welding Procedure Specification for Shielded Metal Arc Welding of Carbon Steel (M-1/P-1, Group 1 or 2), 1/8 in. (3 mm) through 3/4 in. (19 mm) Thick, E6010 (Vertical Downhill) followed by E7018 (Vertical Uphill), in the As-Welded Condition, Primarily Pipe Applications.	B2.1-1-202: 2019
Standard Welding Procedure Specification for Shielded Metal Arc Welding of Carbon Steel (M-1/P-1, Group 1 or 2), 1/8 in. (3 mm) through 3/4 in. (19 mm) Thick, E6010 (Vertical Uphill), In the As-Welded Condition, Primarily Pipe Applications.	B2.1-1-203: 2019
Standard Welding Procedure Specification for Shielded Metal Arc Welding of Carbon Steel (M-1/P-1, Group 1 or 2), 1/8 in. (3 mm) through 3/4 in. (19 mm) Thick, E6010 (Vertical Downhill Root with balance Vertical Uphill), in the As-Welded Condition, Primarily Pipe Applications.	B2.1-1-204: 2019
Standard Welding Procedure Specification for Shielded Metal Arc Welding of Carbon Steel (M-1/P-1, Group 1 or 2), 1/8 in. (3 mm) through 1 ½ in. (38 mm) Thick, E6010 (Vertical Uphill) followed by E7018 (Vertical Uphill), in the As-Welded or PWHT Condition, Primarily Pipe Applications.	B2.1-1-205:2019
Standard Welding Procedure Specification for Shielded Metal Arc Welding of Carbon Steel (M-1/P-1, Group 1 or 2), 1/8 in. (3 mm) through 1-1/2 in. (38 mm) Thick, E6010 Vertical Downhill) followed by E7018 (Vertical Uphill), in the As-Welded or PWHT Condition, Primarily Pipe Applications.	B2.1-1-206:2019
Standard Welding Procedure Specification for Shielded Metal Arc Welding of Carbon Steel (M-1/P-1, Group 1 or 2), 1/8 in. (3 mm) through 1 ½ in. (38 mm) Thick, E7018, in the As-Welded or PWHT Condition, Primarily Pipe Applications.	B2.1-1-208: 2019

ITEM 20-06: Update Clause 2.3 and Table 2.3

GTAW — Gas Tungsten Arc Welding	
TITLE	DESIGNATION: YEAR
Standard Welding Procedure Specification for Gas Tungsten Arc Welding of Carbon Steel, (M-1/P-1, Group 1 or 2), 3/16 in. <u>(5 mm)</u> through 7/8 in. <u>(22 mm)</u> Thick, <u>ER70S-2 and ER70S-3</u> , in the As-Welded Condition, With or Without Backing, Primarily Plate and Structural Applications.	B2.1-1-002: 2006 <u>2020</u>
Standard Welding Procedure Specification for Gas Tungsten Arc Welding of Carbon Steel (M-1/P-1, Group 1 or 2), 1/8 in. (3 mm) through 1 ½ in. (38 mm) Thick, ER70S-2, As-Welded or PWHT Condition, Primarily Pipe Application.	B2.1-1-207: 2019
Standard Welding Procedure Specification for Gas Tungsten Arc Welding with Consumable Insert Root of Carbon Steel (M-1/P-1/S-1, Group 1 or 2), 1/8 in. through 1-1/2 in. Thick, INMS-1, ER70S-2, As-Welded or PWHT Condition, Primarily Pipe Applications.	B2.1-1-210: 2012

FCAW — Flux Core Arc Welding	
TITLE	DESIGNATION: YEAR
Standard Welding Procedure Specification for Self-Shielded Flux Cored Arc Welding of Carbon Steel (M-1/P-1/S-1, Group 1 or 2), 1/8 in. through 1 ½ in. Thick, E71T-8, As-Welded Condition, Primarily Plate and Structural Applications.	B2.1-1-018: 2005
Standard Welding Procedure Specification for CO2 Shielded Flux Cored Arc Welding of Carbon Steel (M-1/P-1/ S-1 , Group 1 or 2), 1/8 in. <u>(3 mm)</u> through 1 ½ in. <u>(38 mm)</u> Thick, E70T-1 and E71T-1, As-Welded Condition, Primarily Plate and Structural Applications.	B2.1-1-019: 2018
Standard Welding Procedure Specification for 75% Ar/25% CO2 Shielded Flux Cored Arc Welding of Carbon Steel (M-1/P-1/ S-1 , Group 1 or 2), 1/8 in. <u>(3 mm)</u> through 1-1/2 in. <u>(38 mm)</u> Thick, E70T-1M and E71T-1M, As-Welded or PWHT Condition, Primarily Plate and Structural Applications.	B2.1-1-020: 2018
Standard Welding Procedure for Self-Shielded Flux Cored Arc Welding of Carbon Steel (M-1/P-1 Group 1 or 2), 1/8 in. (3 mm) through 1/2 in. (13 mm) Thick, E71T-11, As-Welded Condition, Primarily Plate and Structural Applications.	B2.1-1-027: 2018
Standard Welding Procedure Specification (SWPS) for Argon Plus 25% Carbon Dioxide Shielded Flux Cored Arc Welding of Carbon Steel (M-1/P-1/S-1, Groups 1 and 2), 1/8 in. through 1 ½ in. Thick, E7XT-XM, As-Welded or PWHT Condition, Primarily Pipe Applications.	B2.1-1-234: 2006

GMAW — Gas Metal Arc Welding	
TITLE	DESIGNATION: YEAR
Standard Welding Procedure Specification for <u>75%</u> Argon Plus 25% Carbon Dioxide Shielded Gas Metal Arc Welding (Short Circuiting Transfer Mode) followed by Argon Plus 2% Oxygen Shielded Gas Metal Arc Welding (Spray Transfer Mode) of Carbon Steel (M-1/P-1/ S-1 , Groups 1 and 2), 1/8 in. <u>(3 mm)</u> through 1 ½ in. <u>(38 mm)</u> Thick, ER70S-3, <u>in the</u> As-Welded or PWHT Condition, Primarily Pipe Applications.	B2.1-1-233: 2006 <u>2020</u>
Standard Welding Procedure Specification for Argon Plus 2% Oxygen Shielded Gas Metal Arc Welding (Spray Transfer Mode) of Carbon Steel (M-1/P-1/S-1, Groups 1 and 2), 1/8 in. through 1 ½ in. Thick, ER70S-3, Flat Position Only, As-Welded or PWHT Condition, Primarily Pipe Applications.	B2.1-1-235: 2006

ITEM 20-06: Update Clause 2.3 and Table 2.3

GTAW/SMAW Combination of Welding Processes	
TITLE	DESIGNATION: YEAR
Standard Welding Procedure Specification for Gas Tungsten Arc Welding Followed by Shielded Metal Arc Welding of Carbon Steel (M-1/P-1/ S-1 , Group 1 or 2), 1/8 in. <u>(3 mm)</u> through 1 ½ in. <u>(38 mm)</u> Thick, ER70S-2 and E7018, As-Welded or PWHT Condition, Primarily Plate and Structural Applications.	B2.1-1-021: 2018
Standard Welding Procedure Specification for Gas Tungsten Arc Welding followed by Shielded Metal Arc Welding of Carbon Steel (M-1/P-1, Groups 1 or 2), 1/8 in. (3 mm) through 1 ½ in. (38 mm) Thick, ER70S-2 and E7018, As-Welded or PWHT Condition, Primarily Pipe Applications.	B2.1-1-209: 2019
Standard Welding Procedure Specification for Gas Tungsten Arc Welding with Consumable Insert Root Followed by Shielded Metal Arc Welding of Carbon Steel (M-1/P-1/S-1, Group 1 or 2), 1/8 in. through 1 ½ in. Thick, INMs-1, ER70S-2, and E7018 As-Welded or PWHT Condition, Primarily Pipe Applications.	B2.1-1-211: 2012

GMAW/FCAW – Combination of Welding Processes	
TITLE	DESIGNATION: YEAR
Standard Welding Procedure Specification for <u>75%</u> Argon Plus 25% Carbon Dioxide Shielded Gas Metal Arc Welding (Short Circuiting Transfer Mode) Followed by <u>75%</u> Argon Plus 25% Carbon Dioxide Shielded Flux Cored Arc Welding of Carbon Steel (M-1/P-1/S-1 , Groups 1 and-or 2), 1/8 in. <u>(3 mm)</u> through 1 ½ in. <u>(38 mm)</u> Thick, ER70S-3 and E71XT-X , <u>in the</u> As-Welded or PWHT Condition, Primarily Pipe	B2.1-1-232: 2006 <u>2020</u>

Austenitic Stainless Steel — (M8/P8 Materials)

SMAW — Shielded Metal Arc Welding	
TITLE	DESIGNATION: YEAR
Standard Welding Procedure Specification for Shielded Metal Arc Welding of Austenitic Stainless Steel (M-8/P-8/ S-8 , Group 1), 1/8 in. <u>(3 mm)</u> through 1½ in. <u>(38 mm)</u> Thick, As-Welded Condition, Primarily Plate and Structural Applications.	B2.1-8-023: 2018
Standard Welding Procedure Specification for Shielded Metal Arc Welding of Austenitic Stainless Steel (M-8/P-8/S-8, Group 1), 1/8 in through 1½ in. Thick, E3XX-XX, As-Welded Condition, Primarily Pipe Application.	B2.1-8-213: <u>2012</u>

GTAW — Gas Tungsten Arc Welding	
TITLE	DESIGNATION: YEAR
Standard Welding Procedure Specification for Gas Tungsten Arc Welding of Austenitic Stainless Steel (M-8/P-8/S-8, Group 1), 1/16 in. through 1 ½ in. Thick, ER3XX, As-Welded Condition, Primarily Plate and Structural Applications.	B2.1-8-024: 2012
Standard Welding Procedure Specification for Gas Tungsten Arc Welding of Austenitic Stainless Steel (M-8/P-8/S-8, Group 1), 1/16 in. through 1 ½ in. thick, ER3XX, As-Welded Condition, Primarily Pipe Applications.	B2.1-8-212: 2012

ITEM 20-06: Update Clause 2.3 and Table 2.3

Standard Welding Procedure Specification for Gas Tungsten Arc Welding With Consumable Insert Root of Austenitic Stainless Steel (M-8/P-8/S-8, Group 1), 1/8 in. through 1 ½ in. Thick, IN3XX and ER3XX As-Welded Condition, Primarily Pipe Applications.	B2.1-8-215: 2012
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Combination Processes GTAW/SMAW	
TITLE	DESIGNATION: YEAR
Standard Welding Procedure Specification for Gas Tungsten Arc Welding followed by Shielded Metal Arc Welding of Austenitic Stainless Steel (M-8/P-8/S-8, Group 1), 1/8 in. through 1 ½ in. Thick, ER3XX and E3XX-XX, As-Welded Condition, Primarily Plate and Structural Applications.	B2.1-8-025: 2012
Standard Welding Procedure Specification for Gas Tungsten Arc Welding Followed by Shielded Metal Arc Welding of Austenitic Stainless Steel (M-8/P-8/S-8, Group 1), 1/8 in. through 1 ½ in. Thick, ER3XX and E3XX-XX, As-Welded Condition, Primarily Pipe Applications.	B2.1-8-214: 2012
Standard Welding Procedure Specification for Gas Tungsten Arc Welding with Consumable Insert Root followed by Shielded Metal Arc Welding of Austenitic Stainless Steel (M-8/P-8/S-8, Group 1), 1/8 in. through 1 ½ in. Thick, IN3XX, ER3XX, and E3XX-XX As-Welded Condition, Primarily Pipe Applications.	B2.1-8-216: 2012

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

SMAW — Shielded Metal Arc Welding	
TITLE	DESIGNATION: YEAR
Standard Welding Procedure Specifications for Shielded Metal Arc Welding of Carbon Steel (M-1/P-1/S-1, Groups 1 or 2) to Austenitic Stainless Steel (M-8/P-8/S-8, Group 1), 1/8 in. through 1 ½ in. Thick, E309 (L)-15, -16, or -17, As-Welded Condition, Primarily Pipe Applications.	B2.1-1/8-228: 2013

GTAW — Gas Tungsten Arc Welding	
TITLE	DESIGNATION: YEAR
Standard Welding Procedure Specification for Gas Tungsten Arc Welding of Carbon Steel (M-1/P-1/S-1, Groups 1 or 2) to Austenitic Stainless Steel (M-8/P-8/S-8, Group 1), 1/16 in. (1.6 mm) through 1 ½ in. Thick, ER309(L), As-Welded Condition, Primarily Pipe Applications.	B2.1-1/8-227: 2013
Standard Welding Procedure Specifications for Gas Tungsten Arc Welding with Consumable Insert Root of Carbon Steel (M-1/P-1/S-1, Groups 1 or 2) to Austenitic Stainless Steel (M-8/P-8/S-8, Group 1), 1/16 in. (1.6 mm) through 1½ in. Thick, IN309 and ER309(L), As-Welded Condition, Primarily Pipe Applications.	B2.1-1/8-230: 2013

ITEM 20-06: Update Clause 2.3 and Table 2.3

GTAW/SMAW Combination of Welding Processes	
TITLE	DESIGNATION: YEAR
Standard Welding Procedure Specifications for Gas Tungsten Arc Welding followed by Shielded Metal Arc Welding of Carbon Steel (M-1/P-1/S-1, Groups 1 or 2) to Austenitic Stainless Steel (M-8/P-8/S-8, Group 1), 1/8 in through 1½ in. Thick, ER309 (L) and E309 (L)-15, -16, or -17, As-Welded Condition, Primarily Pipe Applications.	B2.1-1/8-229: 2013
Standard Welding Procedure Specifications for Gas Tungsten Arc Welding with Consumable Insert Root followed by Shielded Metal Arc Welding of Carbon Steel (M-1/P-1/S-1, Groups 1 or 2) to Austenitic Stainless Steel (M-8/P-8/S-8, Group 1), 1/8 in. through 1½ in. Thick, IN309, ER309, and E309-15, -16, or -17 or IN309, ER309 (L) and ER309 (L)-15, -16, or -17, As-Welded Condition, Primarily Pipe Applications.	B2.1-1/8-231: 2015

Chromium Molybdenum Steel (M4/P4 and M5A/P5A Materials)

SMAW — Shielded Metal Arc Welding	
TITLE	DESIGNATION: YEAR
Standard Welding Procedure Specifications for Shielded Metal Arc Welding of Chromium-Molybdenum Steel (M-4/P-4, Group 1 or 2), E8018-B2, 1/8 in. through 1½ in. Thick, As-Welded Condition, 1/8 in. through 1½ in. Thick, PWHT Condition, Primarily Pipe Applications.	B2.1-4-218: 2009
Standard Welding Procedure Specifications for Shielded Metal Arc Welding of Chromium-Molybdenum Steel (M-5A/P-5A), E9018-B3, 1/8 in. through 1½ in. Thick, As-Welded Condition, 1/8 in. through 1½ in. Thick, PWHT Condition, Primarily Pipe Applications.	B2.1-5A-223: 2009

GTAW — Gas Tungsten Arc Welding	
TITLE	DESIGNATION: YEAR
Standard Welding Procedure Specifications for Gas Tungsten Arc Welding of Chromium-Molybdenum Steel (M-4/P-4, Group 1 or 2), ER80S-B2, 1/8 in. through 1½ in. Thick, As-Welded Condition, 1/8 in. through ¾ in. Thick, PWHT Condition, Primarily Pipe Applications.	B2.1-4-217: 2009
Standard Welding Procedure Specifications for Gas Tungsten Arc Welding (Consumable Insert Root) of Chromium-Molybdenum Steel (M-4/P-4, Group 1 or 2), E8018-B2, 1/8 in. through 1½ in. Thick, As-Welded Condition, 1/8 in. through ¾ in. Thick, PWHT Condition, IN515 and ER80S-B2, Primarily Pipe Applications.	B2.1-4-220: 2009
Standard Welding Procedure Specifications for Gas Tungsten Arc Welding of Chromium-Molybdenum Steel (M-5A/P-5A), ER90S-B3, 1/8 in. through 1½ in. Thick, As-Welded Condition, 1/8 in. through 3/4 in. (19 mm) Thick, PWHT Condition, Primarily Pipe Applications.	B2.1-5A-222: 2009

ITEM 20-06: Update Clause 2.3 and Table 2.3

Standard Welding Procedure Specifications for Gas Tungsten Arc Welding (Consumable Insert Root) of Chromium-Molybdenum Steel (M-5A/P-5A), 1/8 in. through 1-1/2 in. Thick, As-Welded Condition, 1/8 in. through 3/4 in. Thick, PWHT Condition, IN521 and ER90S-B3, Primarily Pipe Applications.	B2.1-5A-225: 2009
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GTAW/SMAW Combination of Welding Processes	
TITLE	DESIGNATION: YEAR
Standard Welding Procedure Specifications for Gas Tungsten Arc Welding (Consumable Insert Root) followed by Shielded Metal Arc Welding of Chromium- Molybdenum Steel (M-4/P-4, Group 1 or 2), 1/8 in. through 1-1/2 in. Thick, As-Welded Condition, 1/8 in. through 1 ½ in. Thick, PWHT Condition, IN515, ER80S-B2, and E8018-B2, Primarily Pipe Applications.	B2.1-4-221: 2009
Standard Welding Procedure Specifications (SWPS) for Gas Tungsten Arc Welded followed by Shielded Metal Arc Welding of Chromium-Molybdenum Steel (M-4A/P-4, Group 1 or 2), 1/8 in. through 1/2 in. Thick, As-Welded Condition, 1/8 in. through 1 ½ in. Thick, PWHT Condition, ER80S-B2 and E8018-B2, Primarily Pipe Applications.	B2.1-4-219: 2009
Standard Welding Procedure Specifications for Gas Tungsten Arc Welded followed by Shielded Metal Arc Welding of Chromium-Molybdenum Steel (M-5A/P-5A), 1/8 in. through 1 ½ in. Thick, As-Welded Condition, 1/8 in. through 1 ½ in. Thick, PWHT Condition, ER90S-B3 and E9018-B3, Primarily Pipe Applications	B2.1-5A-224: 2009
Standard Welding Procedure Specifications for Gas Tungsten Arc Welding (Consumable Insert Root) followed by Shielded Metal Arc Welding of Chromium-Molybdenum Steel (M-5A/P-5A), 1/8 in. through 1 ½ in. Thick, As- Welded Condition, 1/8 in. through 1 ½ in. Thick, PWHT Condition, IN521, ER90S-B3, and E9018-B3, Primarily Pipe Applications.	B2.1-5A-226: 2009

Item 20-6: Update adding the
2020 revision of the designated
SWPSs.
July 13, 2020

AWS B2.1-1-001:2020
An American National Standard

Approved by the
American National Standards Institute
July 31, 2019

Standard Welding Procedure Specification (SWPS)
for Shielded Metal Arc Welding of Carbon Steel
(M-1/P-1, Group 1 or 2), 3/16 inch [5 mm] through
3/4 inch [19 mm] Thick, E7016 and E7018, in the
As-Welded Condition, Primarily Plate and
Structural Applications

3rd Edition

Revises AWS B2.1-1-001-90 (R2006)

Prepared by the
American Welding Society (AWS) B2 Committee on Procedure and Performance Qualification

Under the Direction of the
AWS Technical Activities Committee

Approved by the
AWS Board of Directors

Abstract

This standard contains the essential welding variables for carbon steel plate and pipe in the thickness range of 3/16 inch [5 mm] through 3/4 inch [19 mm], using manual shielded metal arc welding. It cites the base metals and operating conditions necessary to make the weldment, the filler metal specifications, and the allowable joint designs for fillet and groove welds. This SWPS was developed primarily for plate and structural applications.



Foreword

This foreword is not part of this standard but is included for informational purposes only.

The American Welding Society generates Standard Welding Procedure Specifications (SWPSs) for industry through the cooperative efforts of the AWS B2 Committee on Procedure and Performance Qualification, the AWS B2D Subcommittee on Standard Welding Procedure Specifications, and the AWS B2G Subcommittee on Procedure Qualification Records. The Welding Procedures Committee (WPC) of the Welding Research Council (WRC) originally managed the procedure qualification records in support of AWS Standard Welding Procedure Specifications and was formally transitioned to the AWS B2G Subcommittee on Procedure Qualification Records in 2019.

The need for pretested welding procedures that are supported by adequate test data and that satisfy the technical requirements for the commonly used construction codes and specifications has been expressed by many individuals and organizations. The purpose of a welding procedure qualification is to provide test data for assessing the properties of a weld joint.

This Standard Welding Procedure Specification is an outgrowth of the coordinated work of the AWS B2G Subcommittee on Procedure Qualification Records and the AWS B2 Committee on Procedure and Performance Qualification. The AWS B2G Subcommittee on Procedure Qualification Records has provided the data documented on the Summary of Procedure Qualification Records.

The welding terms used in this specification shall be interpreted in accordance with the definitions given in the latest edition of AWS A3.0M/A3.0, *Standard Welding Terms and Definitions, Including Terms for Adhesive Bonding, Brazing, Soldering, Thermal Cutting, and Thermal Spraying*. Welding symbols shall be those shown in the latest edition of AWS A2.4, *Standard Symbols for Welding, Brazing, and Nondestructive Examination*.

The AWS B2 Committee on Procedure and Performance Qualification was formed in 1979 to provide welding standards concerning the subject of qualification. The primary document developed by this committee is AWS B2.1/B2.1M, *Specification for Welding Procedure and Performance Qualification*. This document established the foundation and framework for Standard Welding Procedure Specifications (SWPSs). The first two SWPSs were published in 1990. Since then SWPSs are continuing to be developed and published by the American Welding Society.

The following changes are included in this revision of the previous edition:

The format has been updated, column titles were added and current heading terminology incorporated, the safety clause was revised, a standard units of measure clause was added, the metric table was deleted, conversions were updated and added to the text and joint details, existing footnotes were updated and new footnotes were added, introductory text to joint details was updated, and an annex on requesting an official interpretation was included.

A vertical line in the margin or underlined text in clauses, tables, or figures indicates an editorial or technical change from the previous edition.

Comments and suggestions for the improvement of this standard are welcome. They should be sent to the Secretary of the AWS B2 Committee on Welding Procedure and Performance Qualification, American Welding Society, 8669 NW 36 St., # 130, Miami, FL, 33166.

AWS B2.1-1-002:2020
An American National Standard

Approved by the
American National Standards Institute
March 16, 2020

Standard Welding Procedure Specification
(SWPS) for Gas Tungsten Arc Welding of Carbon
Steel (M-1/P-1, Group 1 or 2), 3/16 inch [5 mm]
through 7/8 inch [22 mm] Thick, ER70S-2 and
ER70S-3, in the As-Welded Condition,
Primarily Plate and Structural Applications

3rd Edition

Revises AWS B2.1-1-002-90 (R2006)

Prepared by the
American Welding Society (AWS) B2 Committee on Procedure and Performance Qualification

Under the Direction of the
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Approved by the
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AWS B2.1-1-232:2020
An American National Standard

Approved by the
American National Standards Institute
July 31, 2019

Standard Welding Procedure Specification (SWPS)
for 75% Argon Plus 25% Carbon Dioxide Shielded Gas
Metal Arc Welding (Short Circuiting Transfer Mode)
followed by 75% Argon Plus 25% Carbon Dioxide
Shielded Flux Cored Arc Welding of Carbon Steel (M-1/
P-1, Group 1 or 2), 1/8 inch [3 mm] through 1-1/2 inch
[38 mm] Thick, ER70S-3 and E71T-X, in the As-Welded or
PWHT Condition, Primarily Pipe Applications

2nd Edition

Revises AWS B2.1-1-232:2006

Prepared by the
American Welding Society (AWS) B2 Committee on Procedure and Performance Qualification

Under the Direction of the
AWS Technical Activities Committee

Approved by the
AWS Board of Directors

Abstract

This standard contains the essential welding variables for carbon steel in the thickness range of 1/8 inch [3 mm] through 1-1/2 inch [38 mm], using gas metal arc welding (short circuiting transfer mode) with 75% argon plus 25% carbon dioxide shielding for the root followed by flux cored arc welding with 75% argon plus 25% carbon dioxide shielding for the balance. It cites the base metals and operating conditions necessary to make the weldment, the filler metal specifications, and the allowable joint designs for groove welds. This SWPS was developed primarily for pipe application.



Foreword

This foreword is not part of this standard but is included for informational purposes only.

The American Welding Society generates Standard Welding Procedure Specifications (SWPSs) for industry through the cooperative efforts of the AWS B2 Committee on Procedure and Performance Qualification, the AWS B2D Subcommittee on Standard Welding Procedure Specifications, and the AWS B2G Subcommittee on Procedure Qualification Records. The Welding Procedures Committee (WPC) of the Welding Research Council (WRC) originally managed the procedure qualification records in support of AWS Standard Welding Procedure Specifications and was formally transitioned to the AWS B2G Subcommittee on Procedure Qualification Records in 2019.

The need for pretested welding procedures that are supported by adequate test data and that satisfy the technical requirements for the commonly used construction codes and specifications has been expressed by many individuals and organizations. The purpose of a welding procedure qualification is to provide test data for assessing the properties of a weld joint.

This Standard Welding Procedure Specification is an outgrowth of the coordinated work of the AWS B2G Subcommittee on Procedure Qualification Records and the AWS B2 Committee on Procedure and Performance Qualification. The AWS B2G Subcommittee on Procedure Qualification Records has provided the data documented on the Summary of Procedure Qualification Records.

The welding terms used in this specification shall be interpreted in accordance with the definitions given in the latest edition of AWS A3.0M/A3.0, *Standard Welding Terms and Definitions, Including Terms for Adhesive Bonding, Brazing, Soldering, Thermal Cutting, and Thermal Spraying*. The AWS designations for welding gases should be those shown in the latest edition of AWS A5.32M/A5.32 (ISO 14175 MOD), *Welding Consumables—Gases and Gas Mixtures for Fusion Welding and Allied Processes*.

The AWS B2 Committee on Procedure and Performance Qualification was formed in 1979 to provide welding standards concerning the subject of qualification. The primary document developed by this committee is AWS B2.1/B2.1M, *Specification for Welding Procedure and Performance Qualification*. This document established the foundation and framework for Standard Welding Procedure Specifications (SWPSs). The first two SWPSs were published in 1990. Since then SWPSs are continuing to be developed and published by the American Welding Society.

The following changes are included in this revision of the previous edition:

Headings were updated, ASME S numbers were deleted, the metric table was deleted, conversions were updated and added to the text and joint details, existing footnotes were updated and new footnotes were added, the welding symbols were deleted, supplementary powder and backing gas were deleted, and an annex on requesting an official interpretation was included.

A vertical line in the margin or underlined text in clauses, tables, or figures indicates an editorial or technical change from the previous edition.

Comments and suggestions for the improvement of this standard are welcome. They should be sent to the Secretary of the AWS B2 Committee on Welding Procedure and Performance Qualification, American Welding Society, 8669 NW 36 St., # 130, Miami, FL, 33166.

AWS B2.1-1-233:2020
An American National Standard

Approved by the
American National Standards Institute
July 31, 2019

Standard Welding Procedure Specification (SWPS)
for 75% Argon Plus 25% Carbon Dioxide Shielded
Gas Metal Arc Welding (Short Circuiting Transfer Mode)
followed by 98% Argon Plus 2% Oxygen Shielded Gas
Metal Arc Welding (Spray Transfer Mode) of Carbon
Steel (M-1/P-1, Group 1 or 2), 1/8 inch [3 mm] through
1-1/2 inch [38 mm] Thick, ER70S-3, in the As-Welded or
PWHT Condition, Primarily Pipe Applications

2nd Edition

Revises AWS B2.1-1-233:2006

Prepared by the
American Welding Society (AWS) B2 Committee on Procedure and Performance Qualification

Under the Direction of the
AWS Technical Activities Committee

Approved by the
AWS Board of Directors

Abstract

This standard contains the essential welding variables for carbon steel in the thickness range of 1/8 inch [3 mm] through 1-1/2 inch [38 mm], using 75% argon plus 25% carbon dioxide shielded gas metal arc welding (short circuiting transfer mode) for the root followed by 98% argon plus 2% oxygen shielded gas metal arc welding (spray transfer mode) for the balance. It cites the base metals and operating conditions necessary to make the weldment, the filler metal specifications, and the allowable joint designs for groove welds. This SWPS was developed primarily for pipe applications.



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The need for pretested welding procedures that are supported by adequate test data and that satisfy the technical requirements for the commonly used construction codes and specifications has been expressed by many individuals and organizations. The purpose of a welding procedure qualification is to provide test data for assessing the properties of a weld joint.

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Item 20-7

Routine repairs of Div.2 & or Div.3 vessels

Part 3, 3.3.2 a)

Submitted by: Paul Shanks

Explanation of Need: An interpretation is scheduled to be issued under item number 19-26 asserting that Routine repairs are not to be used on Div.2 or Div.3 vessels. Rather than require review of an interpretation which may expire in two years the body of the code should make it clear that Routine repairs are not compatible with div.2 or div.3 vessels.

Background Information: 3.3.5.2 b) makes clear that an Inspector will make the acceptance inspection and sign the R1, the provision in 3.3.2 to waive the AI involvement or routine repairs is simply not applicable.

Proposed Change:

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. ~~As such +Routine repairs are not acceptable~~permitted for ASME Section VIII Div.2 or Div. 3 vessels. 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 the Jurisdiction where the pressure-retaining item is installed;

Item 20-9: Request for Revision to NBIC Section 9: Glossary of terms
Parts 1, 2, 3 and 4 9.1

Purpose	Define "Verify" and "Witness" in the NBIC Part 1, 2, 3, and 4 to align with the definition in NB-263, RCI-1, Rules for Commissioned Inspectors
Scope	Add "Verify" and "Witness" to the terms defined in Section 9 of Parts 1, 2, 3 and 4
Background	The need for the definition of "verify" and "witness" was initiated from Interpretation Item 18-03, which addresses which Inspector (i.e. "IS" Commissioned or "R" Endorsement) signs the FFSA Form NB-403 when an "R" Certificate Holder is involved with a repair in that region as well as determine what level of review of the Fitness-for-Service the Inspector is expected to complete.
Proposed Revision	<p>Verify – To determine that a particular action has been performed in accordance with the requirements either by witnessing the action or reviewing records.</p> <p>Witness – To be present at an event and have first-hand knowledge of the action and be able to attest that it occurred.</p>

Submitted by: Terry Hellman

Proposed Change:
9.1 DEFINITIONS

Verify – To determine that a particular action has been performed in accordance with the requirements either by witnessing the action or reviewing records.

Witness – To be present at an event and have first-hand knowledge of the action and be able to attest that it occurred.

Item 20-9: Request for Revision to NBIC Section 9: Glossary of terms
Parts 1, 2, 3 and 4 9.1

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Submitted by: Terry Hellman

Proposed Change:
9.1 DEFINITIONS

Verify – To determine that a particular action has been performed in accordance with the requirements either by witnessing the action or reviewing records.

Witness – To be physically present, or remotely present as allowed, to confirm an event or condition is true and accurate.



This verbiage was proposed by Part 2 SG, however the verbiage as shown on Page 1 of this attachment was what was approved by the Part 3 SG.

Subject Code Revision to Part 3, 3.3.4.8

File Number NB20-10

Prop. on Pg.

Proposed

Revision

Statement of Need The revision is to clean up language in NBIC Part 3, 3.3.4.8 and to add clarification regarding the inspector required to sign form NB-403 (current request for interpretation linked to this need in Item 20-3).

Project Manager

John Siefert/G.
Galanes

SubGroup

Negatives

SG Meeting Date

Background:

The current language in the NBIC Part 3, 3.3.4.8 makes multiple references to ‘repair’ and/or ‘weld repair’ which might confuse the reader. This language needs to be clarified so it is explicit in 3.3.4.8 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...”

The current language in the NBIC Part 3, 3.3.4.8 needs to reference the correct forms and sections in Part 2 to avoid confusion.

A request for interpretation (current Item 20-3) was made referencing Part 3, 3.3.4.8 in regard to whether the National Board Inspector holding either an “IS” Commission or an “R” Endorsement is required to sign form NB-403. Language is added to 3.3.4.8 c) 5) to clarify this point.

Proposal, rev 0, July 13, 2020

3.3.4.8 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 impact to safety 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 measureable 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 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 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 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 ~~as referenced in NBIC, Part 2, S5.3.~~ 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) 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) When 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 weld repairs shall provide detailed information on the Form R-1, describing the method, ~~and extent, of repair~~ and include the specific location of the weld repair on the item.
- 5) The interval to ~~either~~ re-inspect or remove the item from service or perform weld repair shall be determined based on a risk-based inspection program developed and implemented as required ~~by NBIC Part 3, 3.3.4.8~~ NBIC Part 2, 4.5. The inspection interval shall not exceed the remaining life of the item, and shall be documented on the ~~FFSA Form~~ Form NB-403 and in the Remarks section of the Form R-1. The ~~FFSA Form~~ Form NB-403 shall be affixed to the Form R-1 ~~when weld repairs are performed in NBIC Part 3, 3.3.4.8.~~ 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 ~~FFSA Form~~ Form NB-403 attached may be registered with the National Board, and when required, filed with the Jurisdiction where the item was installed.

Comment [SJ1]: To address concerns in Item 20-3

Item 20-15

Stamping requirements for routine repairs

Part 3, 3.3.2 & 5.7.2 b)

Submitted by: Kathy Moore

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

Background Information: Requested by the Chief of Texas.

Proposed Change:

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 the Jurisdiction where the pressure-retaining item is installed;

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.~~

~~e~~b) Stamping or nameplate shall be applied adjacent to the original manufacturer's stamping or nameplate. A single repair nameplate or stamping may be used for more than one 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 nameplate.

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 20-20

Revision to Part 3, 3.2.2 e)

Part 3, 3.2.2 e)

Submitted by: Eric Feeney – efeeney@teiservices.com

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.

Background Information: The certificate holder is rarely the supplier of the replacement parts. Parts are typically supplied by the owner or OEM. The current wording places the onus on the certificate holder to explain why the parts were not tested in accordance with the original code of construction. (Section I for the inquirer) The reason is most likely a cost savings to the supplier and even if it was, the certificate holder has no authority to rectify this. My company, for one, takes ownership of the parts at the time of receipt inspection at the site of installation.

Proposed Change:

3.2.2 REPLACEMENT PARTS

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.~~

Subject: NBIC Part 3, Qualification of Weld Procedures by Multiple Organizations

Proposal: To add words to 2.2.1 permitting simultaneous qualification of weld procedures by more than one organization.

Explanation: Cost of qualification of weld procedures can represent a considerable cost for a manufacturer for labor, materials, testing etc. Further, when new materials are being introduced to the industry, availability can be extremely limited. Section IX will introduce new rules (already board approved) under item 18-555 (provided in the background information), which provides the framework to allow multiple organizations to supervise the welding of a single test coupon. The rules only permit this when it is expressly permitted by the referencing code. This proposal intends to add words to 2.2.1 of Part 3 to allow Manufacturers to take advantage of the new rules coming to Section IX.

Such testing sessions have already taken place, organized by EPRI, for qualification of repair procedures for Welding Method 6 and Supplement 8.

Current Wording	Proposed Wording
<p>2.2.1 PROCEDURE SPECIFICATIONS</p> <p>A procedure specification is a written document providing direction to the person applying the material joining process. Welding, brazing and fusing shall be performed in accordance with procedure specifications for welding (WPS), brazing (BPS), and fusing (FPS) qualified in accordance with the original code of construction or the construction standard or code selected. When this is not possible or practicable, the procedure specification may be qualified in accordance with ASME Section IX.</p>	<p>2.2.1 PROCEDURE SPECIFICATIONS</p> <p>A procedure specification is a written document providing direction to the person applying the material joining process. Welding, brazing and fusing shall be performed in accordance with procedure specifications for welding (WPS), brazing (BPS), and fusing (FPS) qualified in accordance with the original code of construction or the construction standard or code selected. When this is not possible or practicable, the procedure specification may be qualified in accordance with ASME Section IX.</p> <p><u>Welding procedures may be simultaneously qualified by more than one organization under the rules of ASME Section IX QG-106.4, provided that each organization accepts full responsibility for any such qualifications and complies with the other requirements of Section IX for documentation of welding records.</u></p> <p><u>The "R" Certificate Holder's written quality control program shall include requirements for addressing the rules of Section IX QG-106.4.</u></p>

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18-555 Simultaneous Procedure Qualifications

Existing Text:

QG-106.1 Procedure Qualifications. Each organization is responsible for conducting the tests required by this Section to qualify the procedures that are used in the construction of components under the rules of the Codes, standards, and specifications that reference this Section.

(a) The personnel who produce test joints for procedure qualification shall be under the full supervision and control of the qualifying organization during the production of these test joints. The persons producing test joints for the qualification of procedures shall be either direct employees or shall be personally engaged by contract for material-joining services.

(b) Production of qualification test joints under the supervision and control of another organization is not permitted. However, it is permitted to subcontract any or all of the work necessary for preparing the materials to be joined, the subsequent work for preparing test specimens from the completed test joint, and the performance of nondestructive examination and mechanical tests, provided the organization accepts full responsibility for any such work.

(c) If the effective operational control of procedure qualifications for two or more companies of different names exists under the same corporate ownership, the companies involved shall describe in their Quality Control System or Quality Assurance Program the operational control of procedure qualifications. In this case, separate procedure qualifications are not required, provided all other requirements of this Section are met.

Modified Text:

QG-106.1 Procedure Qualifications. Each organization is responsible for conducting the tests required by this Section to qualify the procedures that are used in the construction of components under the rules of the Codes, standards, and specifications that reference this Section.

(a) The personnel who produce test joints for procedure qualification shall be under the full supervision and control of the qualifying organization during the production of these test joints. The persons producing test joints for the qualification of procedures shall be either direct employees or shall be personally engaged by contract for material-joining services **except as permitted in QG-106.4.**

(b) Production of qualification test joints under the supervision and control of another organization is not permitted **except as permitted in QG-106.4.** However, it is permitted to subcontract any or all of the work necessary for preparing the materials to be joined, the subsequent work for preparing test specimens from the completed test joint, and the performance of nondestructive examination and mechanical tests, provided the organization accepts full responsibility for any such work.

(c) If the effective operational control of procedure qualifications for two or more companies of different names exists under the same corporate ownership, the companies involved shall describe in their Quality Control System or Quality Assurance Program the operational control of procedure qualifications. In this case, separate procedure qualifications are not required, provided all other requirements of this Section are met.

ADD:

QG-106.4 Simultaneous Procedure Qualifications. When expressly permitted by the referencing code, welding procedures may be simultaneously qualified by more than one organization, provided that each organization accepts full responsibility for any such qualifications and the following requirements are met.

(a) Each participating organization shall be represented by an individual with responsibility for qualification of joining procedures, as detailed in QG-106.

(b) A preliminary joining procedure specification acceptable to the representatives of each participating organization shall be prepared addressing the essential and nonessential variables and, when applicable, the supplementary essential variables and other requirements as may be applicable that are to be observed for each process to be used for joining the test coupon(s). If any variables are revised during the joining of a test coupon, the revised variables shall be agreed upon by the representatives of each participating organization.

(c) Joining of the test coupon(s) shall be conducted under the simultaneous supervision of the representatives of each participating organization.

(d) The PQR shall document that the qualification was conducted under the provisions of QG-106.4.