THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

NATIONAL BOARD SUBGROUP REPAIRS AND ALTERATIONS

MINUTES

Meeting of January 14th, 2020
San Diego, CA

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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 circulated (**Attachment 1**).
   Mr. Eric Cutlip was announced as an alternate for Mr. Ray Miletti on the SubGroup.
   With the attached roster and the above noted individual, a quorum was established. There was a motion to approve the roster as published. The motion was unanimously approved.

3. **Announcements**
   Secretary Hellman announced the reception for all committee members and visitors on Wednesday evening and the breakfast and lunch on Thursday.

4. **Adoption of the Agenda**
   Mr. Hellman listed the following changes to the Agenda:
   Add Interp. Item 20-1, 20-2, and 20-3
   Added Action Item 20-4
   Updated Action Item 19-60 scope, (General Description and Explanation of Need)
   A motion was made to adopt the Agenda as amended and was approved. (Abstain – P. Shanks)

5. **Approval of the Minutes of the July 16th, 2019 Meeting**
   There was a motion to approve the Minutes of July 16, 2019 as published. The motion was seconded and unanimously approved.

6. **Review of Rosters (Attachment Page 1)**
   Mr. Boseo held a moment of silence for Mr. David Martinez who passed away late last year.
   Mr. Boseo announced that Jim Pillow has retired 12/19/2019, and Mr. Joel Amato has stepped down from the SG.

   a. **Membership Nominations**
      None.

   b. **Membership Reappointments**
      The following members were unanimously approved to be reappointed to the SG R&A and will be voted on in Subcommittee R&A:
      1. Craig Hopkins
      2. Rick Sturm
      3. Marty Toth
      4. Walter Sperko

7. **Interpretations**
   Mr. Hellman reminded the Subgroup of the Interpretations Items dealing with Part 3 will be worked on at the new Interp. Task Group level and reported directly to the Repair and Alterations Subcommittee. Chairman Boseo decided to skip all Interpretation Items except Item Number 19-26 and 20-3 for discussion.

Item Number: 19-26	NBIC Location: Part 3, 3.3.2	Attachment 2

General Description: Clarification on welding repairs on appendages

Subgroup: Repairs and Alterations

Task Group: Paul Shanks (PM)

Explanation of Need: The original submitter of this item will sometimes need to perform a welding repair on an appendage (not on the tank itself) in order for the complete process of refurbishment to be done for their customers' expectations. There appears to be no direct reference to these types of minor welding repairs for the refurbishment process in the NBIC code.

Meeting Action: Mr. P. Shanks discussed his revised proposal for consideration at the Subcommittee R&A meeting. No action taken.

New Interpretation Requests:

Item Number: 20-3	NBIC Location: Part 3, Section 3 &4 Paragraph: 3.3, 4.4, 4.8, and Form 4.4	Attachment 3

General Description: Inspector involvement in Fitness-for Service assessments

Subgroup: Repairs and Alterations

Task Group: J. Siefert (PM)

Explanation of Need:
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?

Meeting Action: Mr. G. Galanes presented and discussed the possibility of adding FFS assessment activities into Part 3 under a new Action Item. Mr. Siefert discussed the proposal. No action taken.

8. Action Items

Item Number: NB15-1405	NBIC Location: Part 3, 1.2	Attachment 4

General Description: Impact testing of P-11B Material

Subgroup: SG Repairs and Alterations

Task Group: N. Carter (PM), P. Davis, G. Galanes, P. Shanks

July 2019 Meeting Action: Mr. Galanes presented that this is a Progress Report.

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.

Item Number: NB16-1502	NBIC Location: Part 3	No Attachment

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

Subgroup: SG Repairs and Alterations

Task Group: International Repair Supplement Task Group, Chuck Withers (PM)

July 2019 Meeting Action: T. Hellman presented that an email will be sent to Mr. Withers (PM) to see if there is any status updates on this Item.

Meeting Action: Mr. Hellman presented that no work has been done on this item. A motion to Close with No Action was made, seconded, and unanimously approved.

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

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

Subgroup: Repairs and Alterations

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

July 2019 Meeting Action: Progress Report: P. Shanks gave a progress report.

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

Item Number: 18-13	NBIC Location: Part 3	Attachment 5

General Description: Weld Methods 7 addition for dissimilar weld metal-Gr. 91.

Subgroup: SG Repairs and Alterations

Task Group: John Siefert PM, George Galanes

July 2019 Meeting Action: Mr. John Siefert presented background information and a proposal to have this item sent to Subgroup and Subcommittee R&A for a Letter Ballot Vote with a concurrent Review and Comment Letter Ballot to Main Committee. A motion was made, seconded, and unanimously approved.

Update: The proposal for this item was approved by SC R&A via letter ballot and will be reviewed by Main Committee at the January meeting.

Meeting Action: Mr. J. Siefert presented a revised proposal based on comments from B. Boseo, B. Schaeffer, and K. Moore. A motion to send to Letter Ballot for SG R&A was made, seconded, and unanimously approved.

Item Number: 18-65	NBIC Location: Part 3, Section 3	Attachment 6

General Description: Draft rules for "used" material in repairs and/or alterations.

Subgroup: SG Repairs and Alterations

Task Group: Jamie Walker – PM, Marty Toth, Pat Becker, Michael Quisenberry, Issac Osborn, Paul Shanks, B. Underwood

July 2019 Meeting Action: Mr. J. Walker presented a progress report.

Meeting Action: Mr. J. Walker presented. The proposal was revised after much discussion from K. Moore, C. Hopkins, G. Galanes, B. Underwood, and P. Shanks. A motion to accept the proposal as amended was made, seconded, and unanimously approved.

Item Number: 18-66	NBIC Location: Part 3, Section 5	Attachment 7

General Description: Move Report Forms to a new Supplement

Subgroup: SG Repairs and Alterations

Task Group: Marty Toth – PM, Ben Schaefer

July 2019 Meeting Action: B. Schaefer presented a Progress Report on 3 potential options being considered to move the Reports of Repair and their instructions to a new Supplement.

Meeting Action: Mr. M. Toth presented the changes to move Report Forms and instruction to new Supplement. A motion to move the 5 pages of revisions to Letter Ballot for SG R&A was made, seconded, and unanimously approved.

Item Number: 18-75	NBIC Location: Part 3	Attachment 8

General Description: Flush patches in stayed and un-stayed areas of tubesheets

Subgroup: SG Repairs and Alterations

Task Group: Michael Quisenberry (PM), Kathy Moore, Marty Toth, Rick Sturm

July 2019 Meeting Action: M. Quisenberry presented that this Item did not pass Letter Ballot due to lack of votes, but there was no negative comments or disapproval votes. After discussion, a revised proposal was presented as a "short" option to revise the text in paragraph 3.4.6. A straw vote on the "original" proposal vs the revised "short" proposal was taken, with the "short" option winning (8-5). A motion to accept the revised proposal was made, seconded, and unanimously approved.

Update: This proposal was balloted to Main Committee. The ballot received several negative votes and comments.

Meeting Action: Mr. M. Quisenberry presented a revised proposal addressing the negative votes and comments from the MC Letter Ballot. A motion to accept the amended proposal was made, seconded, and unanimously approved.

Item Number: 18-100	NBIC Location: Part 3, 3.3.2	Attachment 9

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

Subgroup: Repairs and Alterations

Task Group: Marty Toth (PM)

July 2019 Meeting Action: Mr. Martinez presented background. Mr. Sperko commented that ASME Section IX Committee has a similar Code Case in progress, expected to pass (ASME Code Case 17-28-13). The proposal was revised based on discussion. A motion to accept the proposal as revised was made, seconded, and unanimously approved.

Update: This item was not approved by Main Committee because no current ASME rules or code cases address this repair.

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.

Item Number: 19-11	NBIC Location: Part 3, 9.1	Attachment 10

General Description: Clarify Definition of Authorized Nuclear Inspection Agency (ANIA)

Subgroup: Repairs and Alterations

Task Group: Chuck Withers – PM, Paul Edwards

Explanation of Need: An ANIA cannot be an Inservice AIA since Endorsements for nuclear inspectors are issued only to new construction AIA's. The requirements for qualified Authorized Nuclear Inspectors/Supervisors are clearly specified in NB-263, RCI-1. Therefore revision to the Glossary definition is needed to clarify this requirement for the NR Accreditation Program.

July 2019 Meeting Action: Mr. Edwards presented changes to paragraph 1.6.3 in lieu of changes to the glossary that better clarified the definition of an ANIA. The proposal was motioned, seconded, and unanimously approved.

Update: The proposal was letter balloted to Main Committee but did not receive enough approval votes to pass. There were three negative votes.

Meeting Action: Mr. P. Edwards presented a revised proposal addressing the ballot comments and negative votes. A motion to accept the amended proposal was made, seconded, and unanimously approved.

Item Number: 19-16	NBIC Location: Part 3, 3.2.2 e)	Attachment 11

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

Subgroup: Repairs and Alterations

Task Group: T. White

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

July 2019 Meeting Action: Mr. White presented and referenced Interpretations 04-05 and 04-11, but he will continue to work on this Item.

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

Item Number: 19-55	NBIC Location: Part 3, 4.4.2 a) 1)	Attachment 12

General Description: Change the maximum test pressure requirement when performing liquid pressure tests of repair activities.

Subgroup: Repairs and Alterations
Task Group: Robert Underwood – PM

Explanation of Need: To change the maximum test pressure requirement when performing liquid pressure tests of repair and alteration activities. This proposal was initially part of item NB16-2603, which proposed changes to 4.4.1 a) 1) and 4.4.2 a) 1). However, only the changes to 4.4.1 a) 1) made it into the 2019 NBIC.

July 2019 Meeting Action: Mr. Underwood presented and the motion to accept the proposal was made, seconded, and unanimously approved.

Update: This item will be up for letter ballot to Main Committee prior to the January meeting.

Meeting Action: This was approved at MC LB 1/12/2020. Item Closed.

New Items:

Item Number: 19-59	NBIC Location: Part 3, 3.2.2 e)	Attachment 13

General Description: Pressure Tests for Replacement Parts

Subgroup: Repairs and Alterations

Task Group: Paul Edwards – PM

Explanation of Need: ASME has issued interpretation I-16-1 and revised PW-54 to clarify that Section I does not contain requirements for the hydrostatic testing of replacement parts. Based on this, the language in 3-3.2.2 e) "… as required by the original code of construction" could be interpreted to mean that pressure testing of parts is not required because Section I does not require testing of replacement parts. On review, this was not the Committee's intent when clause e) was added to 3.2.2. The proposed intent interpretation and a supporting text revision is provided to clarify this issue. By linking the words "original code of construction" to the test pressure, it eliminates the potential interpretation that testing is only required when the original code of construction specifically requires testing of replacement parts.

Meeting Action: Mr. P. Edwards presented that this Item is related to Interp. Item 19-34. Mr. Galanes commented that this may satisfy Item 19-16. After discussion, a motion to accept the proposal was made, seconded, and unanimously approved.

Item Number: 19-60	NBIC Location: Part 3, 1.5.1	Attachment 14

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

Subgroup: Repairs and Alterations

Task Group: Ray Miletti (PM), Paul Davis

Explanation of Need: Part 3, 1.5.1 provides a good outline for a Quality Systems Manual. However, the elements need to be embellished to provide a more auditable description of each element.

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. This was a Progress Report.

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

General Description: Threaded Inserts as Alterations Example

Subgroup: Repairs and Alterations

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

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

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

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

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

Subgroup: Repairs and Alterations

Task Group: None assigned.

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

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

Item Number: 19-69	NBIC Location: Part 3, 5.12.5.1 8) & 5.12.5.1 11)	Attachment 15

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

Subgroup: Repairs and Alterations

Task Group: Ben Schaefer - PM

Explanation of Need: Review verbiage in Part 3, 5.12.5.1 8) and 5.12.5.1.11) to include "Code Case" and "Code Edition" within the text.

Meeting Action: Mr. B. Schaefer presented a revised proposal with the comment that the approval of Action Item 18-66 would require revision to this proposal. The proposal was motioned, seconded, and unanimously approved.

Item Number: 19-82	NBIC Location: Part 3, 1.5.1 j)	Attachment 16

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

Subgroup: Repairs and Alterations

Task Group: M. Quisenberry (PM).

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

Meeting Action: Mr. M. Quisenberry was selected as the PM and presented this as a Progress Report.

Item Number: 19-91	NBIC Location: Part 3, 5.6	Attachment 17

General Description: Form Registration Log

Subgroup: Repairs and Alterations

Task Group: B. Underwood (PM)

Explanation of Need: Many "R" Certificate Holders now register R Forms in the National Board Electronic Data Transfer (EDT) System. The EDT system contains all of the required log information listed in paragraph 5.6 of Part 3, which makes it unnecessary and redundant for the "R" Cert. Holder to maintain a separate log.

Meeting Action: Mr. B. Underwood presented that this proposal is related to Int. Item 19-87. After discussion, a motion to accept the proposal was made, seconded, and unanimously approved.

Item Number: 19-92	NBIC Location: Part 3, 1.5.1 j)	Attachment 18

General Description: Adding "Document Designation" as the second column title in Table 2.3

Subgroup: Repairs and Alterations

Task Group: Jim Sekely – PM

Explanation of Need: This change is being requested so that NBIC matches the naming used by AWS.

Meeting Action: Mr. J. Sekely presented and a motion to accept the proposal was made, seconded, and unanimously approved.

Item Number: 20-4	NBIC Location: Part 3, Table 2.3	Attachment 19

General Description: Updates to SWPS's to the 2019 edition pending approval of Action Item 19-92

Subgroup: Repairs and Alterations

Task Group: Jim Sekely (PM).

Explanation of Need: Revised SWPS's B2.1-1-201:2019 through B2.1-14-209: 2019 to Table 2.3

Mee3ting Action: Mr. J. Sekely presented and a motion to accept the proposal was made, seconded, and unanimously approved.

9. Future Meetings

- July 13th-16th, 2020 – Louisville, KY
- January 11th -14th, 2021 – TBD

10. Adjournment

There being no further business before the Task Group, the Chair adjourned the meeting at 3:00 PM, without objection.

Respectfully submitted,

Terrence Hellman
Repairs and Alterations Secretary

NBIC Subgroup R&A Attendance - 1/14/2019

First Last	Email	Company	Phone #	Signature	Attending Reception?
Frank Johnson	fjkeck22@aol.com	Johnson Welding	419 386-8450		NO
Brian Boseo	brian_boseo@graycor.com	Graycor	630 684-7300		✓
Brian Morelock	morelock@eastman.com	Eastman Chemical Company	423 229-1205		✓
Benjamin Schaefer	bschaefer@aep.com	AEP	614 716-1843		✓
Rick Valdez	rvaldez@prim.com	ARB, INC.	661 331-6024		✓
Wayne Jones	Wayne.Jones@tuvsud.com	ARISE	251 937-6225		✓
Ray Miletti	RLMILETTI@BABCOCK.COM	Babcock & Wilcox	330 860-2589		
James Sekely	jsekely@comcast.net	Consultant	412 389-5567		✓
Robby Troutt	rob.troutt@tdlr.texas.gov	State of Texas	512 539-5720		
Joel Amato	joel.amato@state.mn.us	State of Minnesota	651 284-5137		
Tom White	Thomas.white@nrg.com	NRG Energy	281 782-4972		
Kathy Moore	kathymoore@joemoorecompany.com	Joe Moore & Company	919 832-1665		✓
Nathan Carter	nathan_carter@hsb.com	Hartford Steam Boiler	860 722-5780		✓
Jamie Walker	jwalker@hayesmechanical.com	Hayes Mechanical	773 292-2707		✓
Michael Quisenberry	michael@allentri.com	Allen Tri-State	806 316-7174		✓
John Siefert	jsiefert@epri.com	EPRI	704 595-2886		✓
Terrence Hellman	thellman@nationalboard.org	The National Board	614 431-3234		✓
Timothy McBee	Timothy.McBee@tuvsud.com	ARISE	217 412-9300		✓
Paul Shanks	paul.shanks@onecis.com	OneCIS	832 316-4249		NO
Robert Underwood	robert_underwood@hsb.com	HSB	618 593-6231		✓
Marty Toth	mtoth@boilersafetytraininggroup.com	ECS	615 504 9604		✓
Rick Stowe	rstowe@utah.gov	State of Utah	801-326 7216		✓
JERRY JESSICK	jerry.jessick@gapac.com	GEORGIA PACIFIC	920 819 8570		

NBIC Subgroup R&A Attendance - 1/14/2019

First Last	Email	Company	Phone #	Signature	Attending Reception?
ERIC CUTLIP	evcutlip@babcock.com	B+W	330 860 2637		Y
Robert McGuire	robert.b.mcguire@ge.com	GE	860-719 2916		(1)
PAUL DAVIS	paul.davis22@woodplc.com	Wood GROUP	412.327-7420		Y
SCOTT CHESTNUT	stchestnut@marathonpetroleum.com	MARATHON	925 348-6361		Y
Louis Dutra	LDutra@BaycityBoiler.com	Baycity	925 348-2581		Y
MACT SPERKO	SPERKO@ASME.ORG	SES	336-624 0600		N
CRAIG HOPKINS	chopkins@seattleboiler.com	SBW	206 6790885		Y
Matt Vazquez	VazquezM@asme.org	ASME	212 591-8522		Y
PAT BECKER	pabecker@babcock.com	B&W	330 860-2807		Y
Linn W. Moedinger	linnwm@supernet.com	Strasburg RR	717 575-4478		Y
GORDON GALANIS	ggalanis@dtsmechanical.com	DTS	815-134 2727		Y
Rick Musser	armusser683@gmail.com	Strasburg Rail Road	717 682-7589		Y
MARK RUSSELL	MRUSSELL@TESSERVICES.COM	TESC	864-345-8227		Y
EVEL FEARLY	EFEARLY@TESSERVICES.COM	TESC	803-552-2844		Y
PAUL EDWARDS	EDWARDSP4@ASME.ORG	SVW	617-433-5315	Paul D Edwards	Y

Interpretation IN19-26

Proposed Interpretation

Inquiry:	IN19-26
Source:	Doug Biggar
Subject:	NBIC Part 3 Section Part 3, 3.3.2
Edition:	[Current/all]
General Description:	Repair of none pressure boundary parts
Question 1:	If a welding repair is done to an appendage of a horizontal ASME LPG pressure vessel such as a faulty leg or the raised data plate holder, is this considered routine and are we exempt to have an inspector present to witness it and/or fill out a specialized form?
Reply 1:	No inspector needs to be present as the welding is not performed on any part of the pressure vessel directly related to its performance under pressure.
Question 2:	What is the minimum length of an appendage we can weld onto without being an ASME/NBIC certified welder (only a standard welding ticket)?
Reply 2:	1/4”
Committee’s Question 1:	Are refurbishment activities such as shot blasting, thread cleaning and painting considered within the scope of the NBIC?
Committee’s Reply 1:	No
Rationale 1:	These activities should not affect the pressure retaining integrity of the item, per the introduction to the NBIC that (maintenance) is the function of the NBIC. Reasonably these activities fall outside the scope of the NBIC
Committee’s Question 2:	Are welding operations within the scope of the NBIC when conducted on a part of a PRI which is not required to retain pressure and/or some external loading as per the code of construction scope?
Committee’s Reply 2:	No.
Rationale:2	These welds are such that typical ASME BPV construction codes would not dictate the qualification of the welders or welding operators.
	Q&R2 or Q&R 3 we don’t need both
Committee’s Question 3:	Is the NBIC concerned with welding activities which take place on PRI which have neither a pressure retaining nor load bearing function?

Committee's Reply 3:	No.
Rationale:3	These welds are such that typical ASME BPV construction codes would not dictate the qualification of the welders or welding operators.
NBIC Vote	

Include in response letter: NA

Rationale:

Having emailed the enquirer to determine the scope of their typical operations it was clear that there was a general misunderstanding about the purpose of the NBIC, the proposed questions are overly specific and as sure fail to grasp the crux of the issue hence the question re-write. Q3 was added to ensure that no misunderstand occurs. With the exception of a very hardline reading on Section 3.3.2 a) the NBIC addresses in the main body and the introduction the pressure retaining capability of the item and not work conducted elsewhere.

Sections 3.3.2 e), 3.3.3 & 3.4.4 address working (welding / replacing) on components which have a pressure retaining function. Pipes, tubes, heads, shell, and tube sheet are mentioned, integral parts without pressure retaining function such as legs and davit arms are not addressed.

Section 3.3.3 a) can be read as "Weld repairs ~~or replacement of pressure parts or~~ of (sic) attachments that have failed in a weld or in the base material;"

PROPOSED INTERPRETATION

Inquiry No.	**20-3**
Source	Nathan Carter, Hartford Steam Boiler
Subject	Inspector Involvement for Fitness-for-Service Assessments **Background:** Background: The below questions are intended to gain clarity as to first which Inspector (i.e. "IS" Commissioned or "R" Endorsement) signs the FFSA Form NB-403 when an "R" Certificate Holder is involved with a repair in that region as well as determine what level of review of the Fitness-for-Service the Inspector is expected to complete. If it is an Inspector holding a "R" Endorsement with an AI Commission (not tested on NBIC Part 2), shouldn't the relevant pages in NBIC Part 2 concerning Fitness for Service be included in their tested body of knowledge, so they are aware of the detailed rules? The Body-Of-Knowledge for National Board Inspectors holding either an "IS" Commission or "R" Endorsement does not reference ASME FFS-1/API 579 Fitness-For-Service Standard or have any expectation that the Inspector be capable of determining if the correct Fitness for Service methodology was used or that the assumptions taken by the Engineer in the analysis were the most appropriate or accurate. Clarification is also requested due to the Form NB-403 signature block stating "Verified by" for the Inspector without any other disclaimers as typically found on other Forms signed by Inspectors such as ASME MDRs and NBIC Form R-1/R-2. An example is a R-Certificate holder was hired to repair a weld seam. It was discovered during a repair that multiple base metal laminations existed adjacent to the repair location. A Fitness for Services Evaluation was subsequently performed. The first question is whether or not it is the responsibility of the Repair Inspector to sign the FFSA form once everything has been properly vetted, since the defect being left in place is not necessarily within the scope of the initial repair being performed by the "R" Certificate Holder, or should this be signed off by a Commissioned Inservice Inspector, since they are examined on the rules of NBIC Part 2? Also, Form NB-403 is vague in the signature block region for the scope of what the Inspector is signed for. It could be alluded that without a statement, such as those found on the R-1 and R-2 forms, the Inspector is signing off on the appropriateness and adequacy of the Fitness-For-Service methodology performed by the Engineer.
Edition	2019; Part: Inspection & Repairs and Alterations; Section: 4 & 3; Paragraph: 4.4; Form NB-403; & 3.3.4.8
Question	**Question 1:** In accordance with NBIC Part 3, 3.3.4.8, a fitness-for-service condition assessment as described in NBIC Part 2, 4.4 shall be completed and adequately documented on the FFSA Form NB-403. Once Form NB-403 is completed, is it required that the Inspector signing this Form hold a National Board "R" Endorsement as described in RCI-1/NB-263? **Question 2:** NBIC Part 2 4.4.1 d) states that the Inspector shall indicate acceptance of the Report of FFSA by signing. Paragraph 4.4.3 b) states that the Inspector shall review the condition assessment methodology and ensure that the inspection data and documentation are in accordance with Part 2. Is the Inspector's signature on Form NB-403 an indication that the condition assessment and recommendations completed by the Engineer have been fully reviewed for appropriateness and accuracy by the Inspector?

	Question 3: If the answer to Question 2 is No, is the Inspector's signature on Form NB-403 an indication of acceptance solely on the basis of review of the Form for completeness and verification that the requirements outlined in 4.4 were addressed?
Reply	Proposed Reply 1: Yes Proposed Reply 2: No Proposed Reply 3: Yes
Committee's Question	
Committee's Reply	Question 1: Question 2: Question 3:
Rationale	

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.

3.3.6.2 When the original code of construction requires the welding and testing of production impact test plates, the welding of production impact test plates shall be in accordance with the rules of the original code of construction. ~~The production impact test plates shall be from the material in the vessel. When this is not practicable, the material may be from the same P-No and Group Number as the material being repaired.~~

3.3.6.3 The test material for the welding procedure qualification and for the production impact test plate shall be of the same material specification (including specification type, grade, class, and condition of heat treatment) as the material being repaired. 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).
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 + Mo + V)/5 + (Ni + Cu)/15; elements are expressed in Weight Percent Amounts), but in no case shall the material be lower in strength.

Subject Code Revision to Part 3, 2.5.3.6

File Number NB18-13 **Prop. on Pg.** 2

Proposed Revision Statement of Need The revision is to add a new Welding Method 7 to allow for dissimilar metal welding of Grade 91 to austenitic steels and low alloy steels in a boiler setting and limited to butt welds, in accordance with approved welding method 6.

Project Manager John Siefert/G. Galanes

SubGroup **SG Meeting Date**

Negatives

Background;
Welding Method 7 is being introduced to permit dissimilar metal weld repair with no PWHT between Grade 91 boiler tubes to austenitic steels and low alloy ferritic steels. This action permits DMW of Grade 91 tubes within the boiler setting following welding method 6 with no PWHT.

Update for January 14, 2020. The item was letter balloted at the subcommittee level and revew+comment balloted at the main committee level. At the subcommittee level, the item passed with 11 approve and 1 disapprove. There were three separate editorial comments which are described below. At the main committee level there were 10 approve, 1 abstention and no comments.

The comments received at the subcommittee are addressed in the following 'rev 4' document. The comments were as follows:

1. Brian Boseo provided suggested a very minor edit to clarify 'and nickel alloys' in one of the subheadings. This has not been incorporated, but his suggestion to clarify the materials was taken into account and clarified in the rev 4 document by listing relevant P-Nos. A similar comment was raised by Ben Schaeffer.
2. Kathy Moore made two suggestions, all of which were addressed:
    a. Consistent wording – tube material or tubing?
    b. The values listed for the preheat and interpass temperatures in Fahrenheit and Celsius were different.
3. Ben Schaeffer made several suggestions, all of which were addressed:
    a. I would very much like to see "nonpressure attachments" added to the list of acceptable uses
    b. For the second arrangement 91 to P5A we may use GTAW (root and fill) or GTAW (root) with SMAW (fill). I don't believe we can us either of the

SMAW electrodes listed to root these welds. May I suggest rewording paragraph 2 to try and clarify this?

c. In the very first paragraph you use the terminology "low alloy ferritic steel tubing" which I believe is intended to mean P5A, can we match up this specific reference to the second arrangement where we are talking about P5A tubing to kind of close the loop.

In addition to these comments, the redundancy has been removed and consolidated to make the requirements and verbiage mirror Welding Method 5 or Welding Method 6 where appropriate.

Update for January 15, 2020. It was suggested to clarify verbiage in proposed 2.5.3.7 d) "…and to non-pressure part welds…"

NB Item 18-13

2.5.3.7 WELDING METHOD 7

When using this welding method, the following applies:

a) This welding method may be used when the applicable rules of the original code of construction or the construction standard or code selected permit joining dissimilar materials.

b) The materials shall be limited to ASME P-No. 15E, Group 1 joined to either P-No. 5A or P-No. 8, P-No. 42, P-No. 43 or P-No. 45, as permitted for welded construction by the applicable rules of the original code of construction.

c) The welding shall be limited to the SMAW and/or GTAW processes, manual or automatic, using suitably controlled maintenance procedures to avoid contamination by hydrogen producing sources. The surface of the metal shall be free of contaminants and kept dry.

d) This method is limited to butt welds in tubing NPS 5 (DN 125) or less in diameter and ½ in. (13 mm) or less in wall thickness and to non-pressure part welds for which the applicable rules of the original code of construction did not require notch toughness testing.

e) Application shall be limited to a location internal to the boiler setting.

f) Upon the completion of weld repair, the repair area shall be kept above the dew point temperature so that condensation does not form on the repair surface before returned to service or a moisture-barrier coating shall be applied to the surface.

g) Qualification thickness limits of base metal and weld deposit thickness shall be in accordance with ASME Section IX, QW-451.

h) The welding procedure qualification test coupon shall be ASME P-No. 15 E, Group 1, joined to either P-No. 5A, P-No. 8, P-No. 42, P-No. 43, or P-No. 45.

i) The Welding Procedure Specification (WPS) shall be qualified in accordance with the requirements of ASME Section IX. No postweld heat treatment shall be applied to the test coupon. Additionally, the WPS shall include the following requirements:

1) The minimum preheat for the GTAW process shall be 200°F (93°C). The minimum preheat for the SMAW process shall be

Comment [SJ1]: This section clearly indicates which materials are acceptable. (Ben Schaeffer Comment 3).

Reference to 'austenitic stainless steel' or 'nickel-base alloy' or 'nickel alloy' is removed or not included as this is redundant. (Brian Boseo Comment 1)

Comment [SJ2]: This clearly indicates that GTAW and/or SMAW are permitted to allow for GTAW root and SMAW fill. (Ben Schaeffer Comment 2)

Comment [SJ3]: This is the only reference to 'tubing.' All other references to 'tube' or 'tubing' have been removed. (Kathy Moore Comment 1)

Comment [SJ4]: Clarification raised by Walt Sperko during SG-RA meeting

Comment [SJ5]: This allows for welds between tubes and attachements (a common repair scenario) per Ben Schaeffer Comment 1

300°F (149°C). The maximum interpass temperature shall be 550°F (288°C).The preheat temperature shall be checked to ensure the minimum preheat temperature is maintained during welding and until welding is completed.

2) When the SMAW process is specified for a fill pass layer, the electrode diameter is restricted to a maximum size of 1/8 in. (3.2 mm). When the GTAW-process is specified any limits in filler size is to be shown on the WPS.

3) Regardless of the welding process, only the use of stringer beads shall be permitted.

4) For the joining of ASME P-No. 15E, Group 1 to P-No. 5A, the filler metal shall be limited to a martensitic, iron-base filler metal to those assigned to F-No. 4 or F-No. 6 in ASME Section IX, QW-432 and limited to the following consumables: E8015-B8, E8018-B8 or ER80S-B8.

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

Comment [SJ6]: These values have been changed to reflect proper conversions. (Kathy Moore Comment 2)

Comment [SJ7]: This section clearly indicates which materials are acceptable and which filler material(s) are allowed. (Ben Schaeffer Comment 3)

Comment [SJ8]: This section clearly indicates which materials are acceptable and which filler material(s) are allowed. (Ben Schaeffer Comment 3)

NBIC ACTION ITEM 18-65:

Proposed new sub-paragraphs – 1/10/19

~~3.2.1~~

~~c) Use of replacement material that has previously been in service or considered as used material may be permitted if deemed acceptable by the "R" Certificate Holder, the Inspector and, when required, the Jurisdiction. This material shall conform insofar as possible to the requirements of the original code of construction or construction standard, or code selected, and the NBIC. Material of this nature shall be given an initial visual inspection for verification of similar construction, and at a minimum meet all Code requirements of material(s) to be replaced, e.g; size, chemical, physical, minimum thickness, along with consideration of replacement material history of service, and be provided with original supporting documentation attesting to such.~~

~~d) Where original supporting documentation cannot be provided or is not available, the proposed replacement material shall be verified as being acceptable for use by the "R" Certificate Holder, along with Inspector concurrence, prior to installation. Such verification, at a minimum, shall consist of initial visual inspection along with laboratory analysis (chemical, physical, minimum thickness), and may be supplemented using 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).~~

Proposed Rev. 1 of new sub-paragraph – 1/14/20

3.2.1

c) Use of replacement material or parts that ~~has~~ have previously been in service or considered as used material may be permitted if deemed acceptable by the "R" Certificate Holder, the Inspector, and if required, the Jurisdiction. This material shall conform insofar as possible to the original code of construction or construction standard, or code selected, and the NBIC. Consideration shall be given to the condition of replacement material that has previously been used, including its service history, prior to acceptance. Material/parts that have been in time dependent service shall not be permitted as replacement material/parts without evaluation for exposure time.

323.1.4 Reclaimed Materials. Reclaimed pipe and other piping components may be used, provided they are properly identified as conforming to a listed or published specification (para. 323.1.1 or 323.1.2) and otherwise meet the requirements of this Code. Sufficient cleaning and inspection shall be made to determine minimum wall thickness and freedom from imperfections that would be unacceptable in the intended service.

PART 3, SECTION 11
REPAIRS AND ALTERATIONS — INDEX

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

5.1 SCOPE

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

(19) 5.2 DOCUMENTATION

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

b) Alterations performed in accordance with the NBIC shall be documented on a Form R-2, *Report of Alteration*, as shown in Supplement S9.3~~this section~~. A Form R-4, *Report Supplement Sheet*, as shown in Supplement S9.5, shall be used as needed to record additional data when the space provided on Form R-2 is not sufficient.

c) The organization performing repairs and alterations shall retain a copy of the completed Form "R" Report on file and all records and documentation substantiating the summary of work as described throughout Section 5, and as identified in the "R" Certificate Holder's Quality System Manual. (19)

5.2.1 PREPARATION OF FORM R-1 REPORT OF REPAIR

a) Using the instructions found ~~at NBIC Part 3, 5.12.4.1~~ in Table S9.2 of Supplement 9, preparation of Form R-1 shall be the responsibility of the "R" Certificate Holder performing the repair.

b) Information describing the scope of work used to repair a pressure-retaining item (PRI) shall be documented on a Form R-1 and extended to a Form R-4 as needed to fully describe the repair activities completed per the instructions ~~at NBIC Part 3, 5.12.4.1~~ in Table S9.2 of Supplement 9.

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

d) The Form R-3, *Report of Parts Fabricated by Welding,* Manufacturer's Data Reports, and Certificates of Compliance described in this section shall be a part of the completed Form R-1 and shall be attached thereto. (19)

5.2.2 PREPARATION OF FORM R-2 REPORT OF ALTERATION

a) Using the instructions found ~~at NBIC Part 3, 5.12.4.2, Initial~~ in Table S9.3 of Supplement 9, initial preparation of Form R-2 shall be the responsibility of the "R" Certificate Holder responsible for the design portion of the alteration. The design organization shall complete and sign the "Design Certification" section of the Form R-2. An Inspector shall indicate acceptance of the design by signing the "Certificate of Design Change Review" section of the Form R-2.

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

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

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

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

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

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

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

Using the instructions found ~~at NBIC Part 3, 5.12.4.3~~ in Table S9.4 of Supplement 9, preparation of Form R-3 shall be the responsibility of the "R" Certificate Holder responsible for performing the work.

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

Using the instructions found ~~at NBIC Part 3, 5.12.4.4~~ in Table S9.5 of Supplement 9, preparation of Form R-4 shall be the responsibility of the "R" Certificate Holder responsible for performing the work.

5.3 DISTRIBUTION OF FORM R-1

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

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

5.4 DISTRIBUTION OF FORM R-2

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

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

5.5 REGISTRATION OF FORMS — GENERAL

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

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

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

5.5.1 REGISTRATION FOR REPAIRS

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

5.5.2 REGISTRATION FOR ALTERATIONS

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

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

5.5.3 REGISTRATION FOR FIBER-REINFORCED VESSELS

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

5.5.4 REGISTRATION FOR NUCLEAR REPAIR/REPLACEMENT ACTIVITIES

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

5.5.5 REGISTRATION FOR GRAPHITE VESSELS

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

(19) 5.6 FORM REGISTRATION LOG

“R” or “NR” Certificate Holders shall maintain a log or multiple logs documenting unique and sequentially numbered Form “R” Reports that are registered with the National Board. The logs shall include, as a minimum, each form’s unique registration number, type (R-1, R-2, NR-1, etc.), description of work performed, date of acceptance by the Authorized Inspection Agency, and date the report was submitted to the National Board.

5.7 STAMPING REQUIREMENTS FOR REPAIRS AND ALTERATIONS

5.7.1 GENERAL

The stamping of or attachment of a nameplate to a pressure-retaining item shall indicate that the work was performed in accordance with the requirements of this code. Such stamping or attaching of a nameplate shall be done only with the knowledge and authorization of the Inspector. The “R” Certificate Holder responsible for repair or the construction portion of the alteration shall apply stamping. For a re-rating where no physical changes are made to the pressure-retaining item, the “R” Certificate Holder responsible for design shall apply stamping.

5.7.2 STAMPING REQUIREMENTS FOR REPAIRS

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

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

c) Stamping or nameplate 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.

5.7.3 STAMPING REQUIREMENTS FOR ALTERATIONS

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

5.7.4 STAMPING REQUIREMENTS FOR PARTS

Stamping or nameplate shall be applied in a conspicuous location on the part.

5.7.5 SPECIFIC REQUIREMENTS FOR STAMPING AND NAMEPLATES

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

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

c) Stamping directly on items, when used, shall be done with blunt-nose continuous or blunt-nose interrupted dot die stamps. If direct stamping would be detrimental to the item, required markings may appear on a nameplate affixed to the item.

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

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

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

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

    1) Welding

2) Adhesive, bonding or cementing

3) Tamper-resistant mechanical fasteners of suitable metal construction

FIGURE 5.7.5-a

REQUIRED MARKINGS FOR REPAIRS, WITH USE OF NATIONAL BOARD FORM R-1

REPAIRED BY

CERTIFICATE HOLDER

NATIONAL BOARD "R" CERTIFICATE NUMBER

DATE REPAIRED

FIGURE 5.7.5-b

REQUIRED MARKINGS FOR ALTERATIONS, WITH USE OF NATIONAL BOARD FORM R-2

ALTERED BY

CERTIFICATE HOLDER

M.A.W.P. P.S.I.

AT °F

NATIONAL BOARD "R" CERTIFICATE NUMBER

DATE ALTERED

FIGURE 5.7.5-c

REQUIRED MARKINGS FOR RE-RATINGS, WITH USE OF NATIONAL BOARD FORM R-2

RE-RATED BY

CERTIFICATE HOLDER

M.A.W.P. P.S.I.

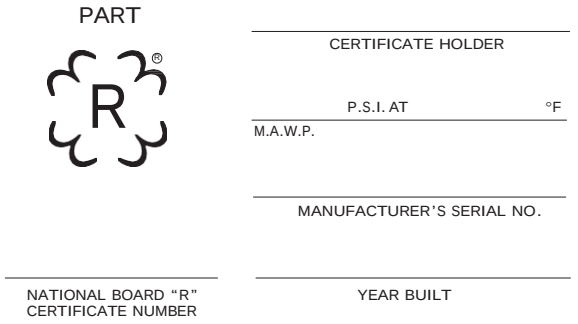
AT °F

NATIONAL BOARD "R" CERTIFICATE NUMBER

DATE ALTERED

FIGURE 5.7.5-d

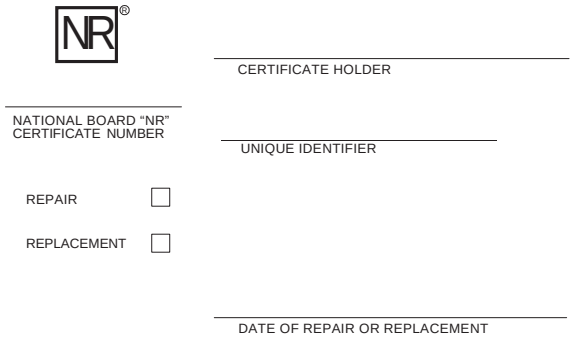
REQUIRED MARKINGS FOR PARTS FABRICATED BY WELDING, WITH USE OF NATIONAL BOARD FORM R-3



Note 1: To be indicated only when changed.

FIGURE 5.7.5-e

REQUIRED MARKINGS FOR NUCLEAR REPAIRS OR REPLACEMENTS



5.8 STAMPING FOR FIBER-REINFORCED VESSELS

The attachment of a nameplate to a repaired or altered vessel or tank shall indicate that work was performed in accordance with requirements of this code. The attachment of a nameplate shall be done only with knowledge and authorization of the Inspector. The certificate holder responsible for repair or alteration shall apply the stamping nameplate. Required stamping and nameplate information are shown in NBIC Part 3, 5.7.

5.8.1 STAMPING FOR REPAIRS

Pressure-retaining items repaired in accordance with the NBIC shall have a nameplate as required by NBIC Part 3, 5.7. Subject to the acceptance of the Jurisdiction and the concurrence of the Inspector, nameplates may not be required for routine repairs (See NBIC Part 3, 5.7.2 b). In all cases, the type and extent of repairs necessary shall be considered prior to waiving the requirement.

5.8.2 STAMPING FOR ALTERATIONS

The nameplate shall be applied in accordance with NBIC Part 3, 5.7. Location of nameplate shall be documented under "Remarks" on NBIC Form R-2 line 9.

5.9 STAMPING REQUIREMENTS FOR YANKEE DRYERS

a) Stamping is not required for repairs that do not affect pressure-retaining capability of the Yankee shell, as indicated on the De-rate Curve, or other pressure-retaining parts, as indicated on the original Manufacturer's Data Report.

b) Stamping is required for repairs that affect pressure-retaining capability of the Yankee Dryer shell, as indicated on the De-rate Curve, or other pressure-retaining parts as indicated on the original Manufacturer's Data Report.

c) Stamping is required for alterations as listed in NBIC Part 3, S5.7.2.

d) Stamping, when required, shall meet the requirements for stamping in NBIC Part 3, 5.7.2. The location of stamping shall be described in the "Remarks" section of Form R-2.

5.10 ALTERNATIVE MARKING AND STAMPING FOR GRAPHITE PRESSURE EQUIPMENT

a) General Requirements

1) This procedure may be used in lieu of the stamping and nameplate requirements defined in this section.

2) The required data as defined in this section shall be 5/32 in. (4 mm) high, minimum.

3) The National Board Code Symbol "R" shall be used to make the impression in the cement.

b) Application of the "R" Code Symbol

1) The graphite surface shall be clean and smooth.

2) Apply a thin coating of cement onto the code part. The cement should have the consistency of toothpaste.

3) Apply sufficient heat to the cement so that it begins to form a skin.

4) Apply a coating of a thinned release agent, such as "anti-seize," to the tip of the "R" stamp with a brush.

5) Press the coated stamp all the way to the bottom of the cement and remove by pulling straight out before the cement hardens.

6) Cure or heat the impression as required.

7) When cured, the part may be washed to remove any excess release agent.

c) Application of characters directly to graphite

1) Use a very thin template of a flexible material (stainless steel; flexible and easily cleaned).

2) Place the template over a clean smooth surface.

3) Hold the template securely and trowel over with approved cement to fill all of the template area.

4) Carefully lift the template from the graphite part and examine the detail of the characters.

5) If acceptable, cure the cement.

6) If the characters are incorrect or damaged, wipe off the cement with a compatible solvent and reapply.

Note: The preceding methods can be applied jointly to identify the graphite part and to transfer the "R" stamp.

5.11 REMOVAL OF ORIGINAL STAMPING OR NAMEPLATE

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

~~5.12 REPAIR AND ALTERATION FORMS AND INSTRUCTIONS FOR COMPLETING FORMS~~

~~The following forms may be used for documenting specific requirements as indicated on the top of each form.~~

~~5.12.1 FORM R-1, *REPORT OF REPAIR*, NB-66~~

~~5.12.2 FORM R-2, REPORT OF ALTERATION, NB-229~~

~~5.12.3 FORM R-3, *REPORT OF PARTS FABRICATED BY WELDING*, NB-230~~

~~5.12.4 FORM R-4, *REPORT SUPPLEMENT SHEET*, NB-231~~

~~5.12.4.1 INSTRUCTIONS FOR COMPLETING NATIONAL BOARD FORM R-1 REPORT~~ ~~(19)~~

~~These instructions are to be used when completing the National Board Form R-1, Report of Repairs. When computer generated, the format of the form shall replicate the type and relative location of the information depicted on the Form R-1 shown in NBIC Part 3, 5.12.1. The numbers below correspond to the "circled" numbers shown on the Form R-1. Note that a fillable version of the Form R-1 (NB-66,) is available on the National Board website, www.nationalboard.org.~~

~~1) Initials of the authorized representative of the "R" Certificate Holder.~~

~~2) Initials of the Inspector reviewing the "R" Certificate Holders work.~~

~~3) When registering a Form R-1 Report with the National Board, this line is solely designated for a unique sequential number assigned by the "R" Certificate Holder. When the "R" Form is not to be registered, indicate so by "N/A". As described in NBIC Part 3, 5.6, a log shall be maintained identifying sequentially, any Form "R" registered with the National Board.~~

~~4) If applicable, document the unique purchase order, job, or tracking number assigned by the organization performing the work.~~

~~5) The name and address of the National Board "R" Certificate Holder performing the work as it appears on the "*Certificate of Authorization*".~~

~~6) Name and address of the owner of the pressure-retaining item.~~

7) Name and address of plant or facility where the pressure-retaining item is installed.

8) Description of the pressure-retaining item, such as boiler or pressure vessel, or piping. Include the applicable unit identification.

9) Name of the original manufacturer of the pressure-retaining item. If the original manufacturer is unknown, indicate by, “unknown.”

10) Document the serial number of the pressure-retaining item if assigned by the original manufacturer. If there is no serial number assigned or is unknown, indicate “unknown.”

11) When the pressure-retaining item is registered with the National Board, document the applicable registration number. If the pressure-retaining item is installed in Canada, indicate the Canadian design registration number (CRN), and list the drawing number under “other.” If the item is not registered, indicate, “none.”

12) Indicate the jurisdiction number assigned to the pressure retaining item, if available.

13) Indicate any other unique identifying nomenclature assigned to the pressure retaining item by the owner or user.

14) Identify the year in which fabrication/construction of the pressure retaining item was completed.

15) Indicate edition and addenda of the NBIC under which this work is being performed.

16) Indicate the name, section, division, edition, and addenda (if applicable) of the original code of construction for the pressure-retaining item.

17) Indicate the name, section, division, edition, and addenda (if applicable) of the construction code used for the work being performed. If code cases are used, they shall be identified in the “Remarks” section.

18) Check the repair type performed on the pressure retaining item.

19) Provide a detailed summary describing the scope of work that was completed to a pressure retaining item (PRI). The information to be considered when describing the scope of work should include such items as, the nature of the repair (i.e. welding, bonding, cementing), the specific location of the work performed to the PRI, the steps taken to remove a defect or as allowed by 3.3.4.8 to remain in place, the method of repair described as listed in the examples of Part 3, Section 3 or supplemental section if applicable, and the acceptance testing and or examination method used in accordance with the NBIC. When additional space is required to describe the scope of work, a Form R-4 shall be used and attached (check box). If a FITNESS FOR SERVICE Form (NB-403) is part of the Form R-1 repair package, check box and attach the form. Information determined to be of a proprietary nature need not be included, but shall be stated on the form.

20) Indicate type of pressure test applied (Liquid, Pneumatic, Vacuum, Leak). If no pressure test applied, indicate “none.”

21) Indicate test pressure applied.

22) Indicate maximum allowable working pressure (MAWP) for the pressure retaining item, if known.

23) As applicable, identify what Replacement Parts manufactured by welding or bonding were introduced as needed to complete the scope of work. Indicate part, item number, manufacturer’s name, stamped identification, and data report type or Certificate of Compliance.

24) Indicate any additional information pertaining to the work involved (e.g., routine repairs, code cases).

25) When registering a Form R-1 Report with the National Board, this line is solely designated for a unique sequential number assigned by the “R” Certificate Holder. When the “R” Form is not to be registered,

indicate so by “N/A”. As described in NBIC Part 3, 5.6, a log shall be maintained identifying sequentially, any Form “R” registered with the National Board.

26) If applicable, document the unique purchase order, job, or tracking number assigned by organization performing work.

27) Type or print name of authorized representative of the “R” Certificate Holder attesting to accuracy of the work described.

28) Indicate National Board “R” *Certificate of Authorization* number.

29) Indicate month, day, and year that the “R” *Certificate of Authorization* expires.

30) Record name of “R” Certificate Holder who performed the described work, using full name as shown on the *Certificate of Authorization* or an abbreviation acceptable to the National Board.

31) Signature of “R” Certificate Holder authorized representative.

32) Enter month, day, and year repair certified.

33) Type or print name of Inspector.

34) Indicate Inspector’s Jurisdiction.

35) Indicate Inspector’s employer.

36) Indicate address of Inspector’s employer (city and state or province).

37) Indicate month, day, and year of final inspection by Inspector. For routine repairs this shall be the month, day, and year the Inspector reviews the completed routine repair package.

38) Inspector’s National Board commission number and endorsement that qualifies the Inspector to sign this report, and when required by the Jurisdiction, the applicable State or Provincial numbers.

39) Signature of Inspector.

40) Indicate month, day, and year of Inspector signature

5.12.4.2 INSTRUCTIONS FOR COMPLETING NATIONAL BOARD FORM R-2 REPORT

These instructions are to be used when completing the National Board Form R-2, Report of Alteration. The numbers below correspond to the “circled” numbers depicted on Form R-2 in NBIC Part 3, 5.12.2. When computer generated, the format of the form shall replicate the type and relative location of the information depicted on the Form R-2 Report of Alteration. Note that a fillable version of the Form R-2 (NB-229) is available on the National Board website.

1) Initials of the National Board “R” Certificate of Authorization authorized representative who registers the Form R-2.

2) Initials of the Inspector who certified the completed Form R-2 for registration.

3) When registering a Form R-2 with the National Board, this line is solely designated for a unique sequential number assigned by the “R” Certificate Holder. As described in NBIC Part 3, Paragraph 5.6, a log shall be maintained identifying unique and sequentially numbered Form “R” reports that are registered with the National Board. For rerating only, the Design Organization registers the Form R-2.

4) If applicable, document the unique purchase order, job, or tracking number assigned by the organization performing the work.

5) The name and address of the National Board "R" *Certificate of Authorization* holder performing the design as it appears on the "Certificate of Authorization".

6) The name and address of the National Board "R" *Certificate of Authorization* holder performing the construction activity as it appears on the "Certificate of Authorization."

7) Name and address of the owner of the pressure-retaining item.

8) Name and address of the plant or facility where the pressure-retaining item is installed.

9) Description of the pressure-retaining item, such as boiler or pressure vessel, or piping. Include the applicable unit identification.

10) Name of the original manufacturer of the pressure-retaining item. If the original manufacturer is unknown, indicate by, "unknown."

11) Document the serial number of the pressure-retaining item if assigned by the original manufacturer. If there is no serial number assigned or it is unknown, indicate "unknown."

12) When the pressure-retaining item is registered with the National Board, document the applicable registration number. If the pressure-retaining item is installed in Canada, indicate the Canadian design, registration number (CRN), and list the drawing number under "other." If the item is not registered, indicate, "none."

13) Indicate the jurisdiction number assigned to the pressure retaining item, if available.

14) Indicate any other unique identifying nomenclature assigned to the pressure retaining item by the owner or user.

15) Identify the year in which fabrication/construction of the pressure retaining item was completed.

16) Indicate edition and addenda of the NBIC under which this work is being performed, as applicable.

17) Indicate the name, section, division, edition, and addenda (if applicable) of the original code of construction for the pressure-retaining item.

18) Indicate the name, section, division, edition, and addenda (if applicable) of the construction code used for the work being performed. If code cases are used, they shall be identified in the "Remarks" section.

19) Provide a detailed summary of the scope of design that was performed. When additional space is required to describe the design scope, a Form R-4 shall be used and attached (check box if needed).

20) The information to be considered when describing the construction scope of work should include such items as, the nature of the alteration (i.e. welding, bonding, cementing), the specific location of the work performed to the pressure retaining item, the steps taken to remove a defect or as allowed by NBIC Part 3, Paragraph 3.3.4.8 to remain in place, and the method of alteration described as listed in the examples of NBIC Part 3, Paragraph 3.4.4 or applicable supplement. When additional space is required to describe the construction scope, a Form R-4 shall be used and attached (check box if needed).

21) Indicate type of pressure test applied (liquid, pneumatic, vacuum, leak). If no pressure test applied, indicate "none."

22) Indicate test pressure applied.

23) Indicate maximum allowable working pressure (MAWP) for the pressure retaining item. (As altered)

24) When registering a Form R-2 with the National Board, this line is solely designated for a unique sequential number assigned by the "R" Certificate Holder. As described in NBIC Part 3, Paragraph 5.6,

a log shall be maintained identifying unique and sequentially numbered Form "R" reports that are registered with the National Board. For rerating only, the Design Organization registers the Form R-2.

25) If applicable, document the unique purchase order, job, or tracking number assigned by organization performing work.

26) As applicable, identify what parts manufactured by welding or bonding were introduced as needed to complete the scope of work. Indicate part, item number, manufacturer's name, stamped identification, and data report type or Certificate of Compliance.

27) Indicate any additional information pertaining to the work involved (e.g. code cases, interpretations used).

28) Type or print name of the National Board "R" *Certificate of Authorization* authorized representative responsible for design certification.

29) Indicate National Board "R" *Certificate of Authorization* number.

30) Indicate month, day, and year that the "R" *Certificate of Authorization* expires.

31) Indicate month, day, and year the alteration was certified.

32) Record the name of National Board "R" *Certificate of Authorization* holder who performed the design portion of the work, using full name as shown on the "*Certificate of Authorization*" or an abbreviation acceptable to the National Board.

33) Signature of National Board "R" *Certificate of Authorization* authorized representative for the design change.

34) Type or print the name of Inspector certifying the design review.

35) Indicate Inspector's Jurisdiction.

36) Indicate Inspector's employer.

37) Indicate address of Inspector's employer (city and state or province).

38) Indicate the month, day and year of the design certification by the Inspector.

39) Signature of the Inspector certifying the design review.

40) Inspectors National Board commission number and endorsement that qualifies the Inspector to sign this report, and when required by the Jurisdiction, the applicable State or Provincial numbers.

41) Type or print name of the National Board "R" *Certificate of Authorization* authorized representative responsible for any construction.

42) Indicate the National Board "R" *Certificate or Authorization* number.

43) Indicate month, day, and year the National Board "R" *Certificate of Authorization* expires.

44) Indicate the date the alteration was certified.

45) Record the name of National Board "R" *Certificate of Authorization* holder who performed the construction portion of the described work, using full name as shown on the *Certificate of Authorization* or an abbreviation acceptable to the National Board.

46) Signature of National Board "R" *Certificate of Authorization* authorized representative.

47) Type or print the name of Inspector certifying the construction inspection.

48) Indicate the Inspector's Jurisdiction.

49) Indicate Inspector's employer.

50) Indicate address of Inspector's employer (city and state or province).

51) Indicate the month, day and year of the final inspection by the Inspector.

52) Indicate the month, day and year the completed Form R-2 was signed by the Inspector.

53) Signature of the Inspector certifying the construction inspection.

54) Inspector's National Board commission number and endorsement that qualifies the Inspector to sign this report, and when required by the Jurisdiction, the applicable State or Provincial numbers.

(19) 5.12.4.3 INSTRUCTIONS FOR COMPLETING NATIONAL BOARD FORM R-3 REPORT

This guide is to be used when completing the National Board Form R-3, Report of Parts Fabricated by Welding. The numbers below correspond to the "circled" numbers shown on the Form R-3 in NBIC Part 3, 5.12.3. When computer generated, the format of the form shall replicate the type and relative location of the information depicted on the Form R-3 Report of Parts Fabricated by Welding. Note that a fillable version of the Form R-3 (NB-230) is available on the National Board website.

1) Initials of the National Board "R" *Certificate of Authorization* authorized representative who registers the Form R-3.

2) Initials of the Inspector who certified the completed Form R-3 for registration.

3) When registering a Form R-3 Report with the National Board, this line is solely designated for a unique sequential number assigned by the "R" Certificate Holder. When the "R" Form is not to be registered, indicated so by "N/A". As described in NBIC Part 3, Paragraph 5.6, a log shall be maintained identifying unique and sequentially numbered Form "R" reports that are registered with the National Board.

4) The name and address of the National Board "R" Certificate Holder who manufactured the welded parts as it appears on the "*Certificate of Authorization.*"

5) If applicable, document the unique purchase order, job, or tracking number assigned by organization performing work.

6) Document name and address of organization that purchased the parts for incorporation into the repair or alteration. If the part's origin is unknown or the part was built for stock, so state.

7) Document name of organization responsible for specifying the code design conditions, if known. If origin of design conditions are not known, state "unknown."

8) Document name of organization responsible for performing the code design, if known. If code design organization is not known, state "unknown."

9) Name, section, and division of the design code, if known. If the design is not known, state "unknown."

10) Indicate code edition year used for fabrication.

11) Indicate code addenda date used for fabrication, if applicable.

12) Indicate the code paragraph reference for formula used to establish the MAWP, if known. If the code reference of the formula is not known, state "unknown."

13) If available, identify component by part's original name, function, or use the original equipment manufacturer's "mark or item number."

14) Indicate quantity of named parts.

15) Match line number of part references for Identification of Parts in item 5 and the Description of Parts in item 6.

16) Indicate manufacturer's serial number or identification number for the named part.

17) Indicate drawing number for the named part.

18) Indicate maximum allowable working pressure (MAWP) for the part, if known.

19) Indicate test pressure, if applied.

20) Identify the year in which fabrication/construction of the item was completed.

21) Use inside diameter for size: indicate shape as square, round, etc.

22) Indicate the complete material specification number and grade.

23) Indicate nominal thickness of plate and minimum thickness after forming.

24) Indicate shape as flat, dished, ellipsoidal, or hemispherical.

25) Indicate minimum thickness after forming.

26) Indicate the complete material specification number and grade for the head or end.

27) Indicate outside diameter.

28) Indicate minimum thickness of tubes.

29) Indicate the complete material specification number and grade for tubes.

30) Indicate any additional information pertaining to the work involved (e.g. code cases). The part manufacturer is to indicate the extent he has performed any or all of the design function. If only a portion of the design, state which portion.

31) When registering a Form R-3 Report with the National Board, this line is solely designated for a unique sequential number assigned by the "R" Certificate Holder. When the "R" Form is not to be registered, indicated so by "N/A". As described in NBIC Part 3, Paragraph 5.6, a log shall be maintained identifying unique and sequentially numbered Form "R" reports that are registered with the National Board.

32) If applicable, document the unique purchase order, job, or tracking number assigned by organization performing work.

33) Type or print name of authorized representative of the "R" Certificate Holder attesting to accuracy of the work described.

34) Indicate National Board "R" *Certificate of Authorization* number.

35) Indicate month, day, and year that the "R" *Certificate of Authorization* expires.

36) Indicate the date the repair was certified.

37) Record name of "R" Certificate Holder who performed the described work, using full name as shown on the *Certificate of Authorization* or an abbreviation acceptable to the National Board.

38) Signature of National Board "R" *Certificate of Authorization* authorized representative.

39) Type or print name of Inspector.

40) Indicate Inspector's Jurisdiction.

41) Indicate Inspector's employer.

42) Indicate address of Inspector's employer (city and state or province).

43) Indicate month, day, and year of final inspection by Inspector.

44) Indicate the month, day and year the completed Form "R" was signed by the Inspector.

45) Signature of Inspector.

46) Inspector's National Board commission number and endorsement that qualifies the Inspector to sign this report, and when required by the Jurisdiction, the applicable State or Provincial numbers.

(19) **5.12.4.4 INSTRUCTIONS FOR COMPLETING NATIONAL BOARD FORM R-4 REPORT**

This guide is to be used when completing the National Board Form R-4, Report Supplement Sheet. The numbers below correspond to the "circled" numbers shown on the Form R-4 in NBIC Part 3, 5.12.4. When computer generated, the format of the form shall replicate the type and relative location of the information depicted on the Form R-4, Report Supplement Sheet. Note that a fillable version of the Form R-4 (NB-231) is available on the National Board website.

1) When registering a Form "R" Report with the National Board, this line is solely designated for a unique sequential number assigned by the "R" Certificate Holder. When the "R" Form is not to be registered, indicate so by "N/A". As described in NBIC Part 3, Paragraph 5.6, a log shall be maintained identifying unique and sequentially numbered Form "R" reports that are registered with the National Board. Complete information identical to that shown on the Form "R" to which this sheet is a supplement.

2) If applicable, document the unique purchase order, job, or tracking number, assigned by the organization performing work.

3) The name and address of the Certificate Holder performing the work as it appears on the "*Certificate of Authorization.*"

4) Name and address of the owner of the pressure-retaining item.

5) Name and address of plant or facility where the pressure-retaining item is installed.

6) Indicate the Form "R" type to which this report is supplementary. Example: Form R-1, Form R-2, Form R-3.

7) Indicate the reference line number from the Form "R" to which this report is supplementary.

8) Complete information for which there was insufficient space on the reference Form "R".

9) Indicate the date certified.

10) Signature of the repair organizations authorized representative.

11) Record name of "R" Certificate Holder who performed the described work, using full name as shown on the *Certificate of Authorization* or an abbreviation acceptable to the National Board.

12) Indicate the date the form was completed by the Inspector.

13) Signature of the Inspector.

14) Inspector's National Board commission number and endorsement that qualifies the Inspector to sign this report, and when required by the Jurisdiction, the applicable State or Provincial numbers.

5.12.5 FORM NR-1, *NUCLEAR COMPONENTS AND SYSTEMS IN NUCLEAR POWER PLANTS*, SEE PG. 96

5.12.5.1 GUIDE FOR COMPLETING NATIONAL BOARD FORM NR-1 REPORT OF REPAIR/ REPLACEMENT ACTIVITIES FOR NUCLEAR FACILITIES

This guide is to be used when completing the National Board Form NR-1, Report of Repair/Replacement Activities for Nuclear Facilities. When computer generated, the form shall replicate the content and format of the information depicted on the Form NR-1, Report of Repair/Replacement Activities for Nuclear Facilities.

Title Block: Check type of activity, repair/replacement and/or rerating, as applicable.

Check category of activity, 1, 2, or 3, as described in Part 3, Paragraph 1.6.2.

1) Name and address of the organization, as shown on the National Board "NR" *Certificate of Authorization*, which performed the activity.

2) Indicate NR Form Registration Number.

3) Indicate the repair/replacement plan, job number, etc., as applicable, assigned by the organization that performed the work for traceability to documentation.

4) Name and address of the owner of the nuclear facility.

5) Name and address of the nuclear power plant and, if applicable, identification of the unit.

6) Identify the system or component (e.g., residual heat removal, reactor coolant) with which the repair/ replacement and/or re-rating activity is associated.

7) Identify the original design specification number and revision for the system or component listed in line 4.

8) Identify the original construction code, edition/addenda used for the system or component identified in line 4.

9) NBIC Edition used for performing activities specified on this form.

10) Organization having responsibility for design when there is a change from the original design specification.

11) Identify code edition/addenda used for design, when applicable.

12) Check the type of test conducted (e.g., hydrostatic, pneumatic, system leakage, exempt, or other) and indicate the pressure applied when applicable.

13) Indicate the number of components where work was performed. Each component shall be indicated on page 2 of the form NR-1.

14) Provide a detailed summary describing the scope of work completed. Information to be considered should include type of work (welding, brazing, fusing), location, steps taken for removal or acceptance of defects, examinations, testing, heat treat, and other special processes or methods utilized. If Necessary, attach additional data, sketch, drawing, Form R-4, etc. In the remarks section state if additional data is attached.

15) Indicate any additional information pertaining to the work, including manufacturer's data reports.

16) Number in sequence beginning with No. 1 to identify each component work was performed. This number may be used to correspond with the detailed description of work performed.

17) Identify the type of item. i.e. piping, pump, valve, etc.

18) Identify the manufacturer's name of component.

19) Identify the manufacturer's serial no. or other assigned number for traceability.

20) Identify the National Board registration number, if previously assigned.

21) Identify the code class criteria, as assigned for each component.

22) Identify the code section used to perform work.

23) Identify Code section year and/or addenda used to perform work.

24) Identify any code cases used for work performed.

25) Identify any revisions to be made to the design specifications or if any design reconciliations were performed.

26) Type or print name of authorized representative from the certificate holder.

27) Name of the organization that performed the identified work, using the full name as shown on the *Certificate of Authorization*, or an abbreviation acceptable to the National Board.

28) Indicate code section as applicable to the repair/replacement activity and/or re-rating activity performed.

29) Indicate National Board *Certificate of Authorization* number.

30) Indicate month, day, and year the certificate expires.

31) Signature of authorized representative from the NR certificate holder.

32) Indicate month, day and year of signature by the Authorized Representative.

33) Title of authorized representative as defined in the Quality Program.

34) Type or print name of Authorized Nuclear Inspector.

35) Indicate the Jurisdiction where the activity is performed, when required.

36) Indicate Authorized Nuclear Inspector's employer.

37) Indicate month, day, and year of inspection by the Authorized Nuclear Inspector.

38) Signature of Authorized Nuclear Inspector.

39) Indicate month, day, and year of signature by the Authorized Nuclear Inspector.

40) National Board Commission number and required endorsements.

5.12.6 FORM NVR-1, *NUCLEAR PRESSURE RELIEF DEVICES*, SEE PG. 99

5.12.6.1 GUIDE FOR COMPLETING NATIONAL BOARD FORM NVR-1 REPORT OF REPAIR/REPLACEMENT ACTIVITIES FOR NUCLEAR PRESSURE RELIEF DEVICES

This guide is to be used when completing the National Board Form NVR-1, Report of Repair/Replacement Activities for Nuclear Pressure Relief Devices. When computer generated, the format of the form shall

replicate the type and relative location of the information depicted on the Form NVR-1, Report of Repair/ Replacement Activities for Nuclear Pressure Relief Devices.

Title Block: Check type of activity, repair/replacement, as applicable.

Check category of activity, 1, 2, or 3, as described in Part 3, Paragraph 1.6.2.

1) Name and address of the organization, as shown on the National Board "VR" and "NR" *Certificates of Authorization*, which performed the activity.

2) Indicate NVR Form Registration Number.

3) Indicate the repair/replacement plan number, job number, etc., as applicable for traceability, assigned by the organization that performed the work.

4) Name and address of the organization for which the work was performed.

5) Name and address of the owner nuclear facility.

6) Name and address of the nuclear facility and, if applicable, identification of the unit.

7) Identify the edition, addenda, and as applicable, code cases of the code used for the inservice inspection activity.

8) Identify the edition, addenda, and as applicable, code cases of the code used for the repair/replacement activity.

9) Identify the NBIC edition used for the repair/replacement activity.

10) Identify the organization responsible for design or design reconciliation, if applicable.

11) Indicate the set pressure of the valve.

12) Indicate the blowdown, if applicable, as a percentage of set pressure.

13) Indicate the location of testing.

14) Indicate medium (steam, air, etc.) used for the adjustment of the set pressure and, if applicable, blowdown.

15) Provide a detailed summary describing the scope of work completed. Information to be considered should include type of work (welding, brazing, fusing), location, steps taken for removal or acceptance of defects, examinations, testing, heat treat, and other special processes or methods utilized. If Necessary, attach additional data, sketch, drawing, Form R-4, etc. If additional data is attached, so state in the remarks section.

16) Indicate any additional information pertaining to the work, such as, additional documentation that is attached to this form to further support item 15.

17) Manufacturer's name of the affected item.

18) Describe the type of pressure relief device (e.g., safety valve, safety relief valve, pressure relief valve).

19) Manufacturer's serial number of the affected item.

20) National Board number, if applicable, of the affected item.

21) Indicate the service as steam, liquid, air/gas, etc.

22) Indicate the pressure relief device by inlet size, in inches.

23) Indicate the year the affected item was manufactured.

24) Indicate the name, section and division of the original construction code for the affected item.

25) Indicate the code class for the affected item as applicable, i.e. Class 1, 2 or 3.

26) Indicate the construction code edition for the affected item.

27) Indicate the construction code addenda, as applicable, for the affected item.

28) Indicate any applicable code cases used for manufacturing of the affected item.

29) Name of the replacement part.

30) Identifying number of the replacement part.

31) Number/quantity of each replacement part used.

32) Indicate the Serial number or other traceability used by the manufacturer of the replacement part.

33) Type or print name of authorized representative from the certificate holder.

34) Indicate code as applicable to the repair/replacement activity performed.

35) Indicate National Board *Certificate of Authorization* number, if applicable for the "VR" Stamp.

36) Indicate month, day, and year the certificate expires, if applicable for the "VR" Stamp.

37) Indicate National Board *Certificate of Authorization* number, if applicable for the "NR" Stamp.

38) Indicate month, day, and year the certificate expires, if applicable for the "NR" Stamp.

39) Signature of authorized representative from the certificate holder defined in item 27 above.

40) Indicate month, day, and year of signature by the authorized representative.

41) Title of authorized representative as defined in the Quality Program.

42) Type or print name of Authorized Nuclear Inspector.

43) Indicate the Jurisdiction where the activity is performed, when required.

44) Indicate Authorized Nuclear Inspector's employer.

45) Indicate address of Authorized Nuclear Inspector's employer (city and state or province).

46) Indicate month, day, and year of inspection by the Authorized Nuclear Inspector.

47) Signature of Authorized Nuclear Inspector defined in item 42 above.

48) Indicate month, day, and year of signature by the Authorized Nuclear Inspector.

49) National Board Commission number and required endorsements.

SUPPLEMENT 9
REPAIR AND ALTERATION FORMS AND INSTRUCTIONS FOR COMPLETING FORMS

S9.1 SCOPE

a) This supplement provides requirements and guidelines for completing the following National Board Forms

   1) R-1 (Report of Repair, form NB-66)

   2) R-2 (Report of Alteration, form NB-229)

   3) R-3 (Report of Parts Fabricated by Welding, form NB-230)

   4) R-4 (Report Supplement Sheet, form NB-231)

   5) NR-1 (Report of Repair/Replacement Activities for Nuclear Facilities, form NB-81)

   6) NVR-1 (Report of Repair/Replacement Activities for Nuclear Pressure Relief Devices, form NB-160).

b) Immediately following each of the forms within this supplement is a guide for completing that form. The forms may be used for documenting specific requirements as indicated on the top of each form. The explanations included in the guides are keyed to the forms in the following manner:

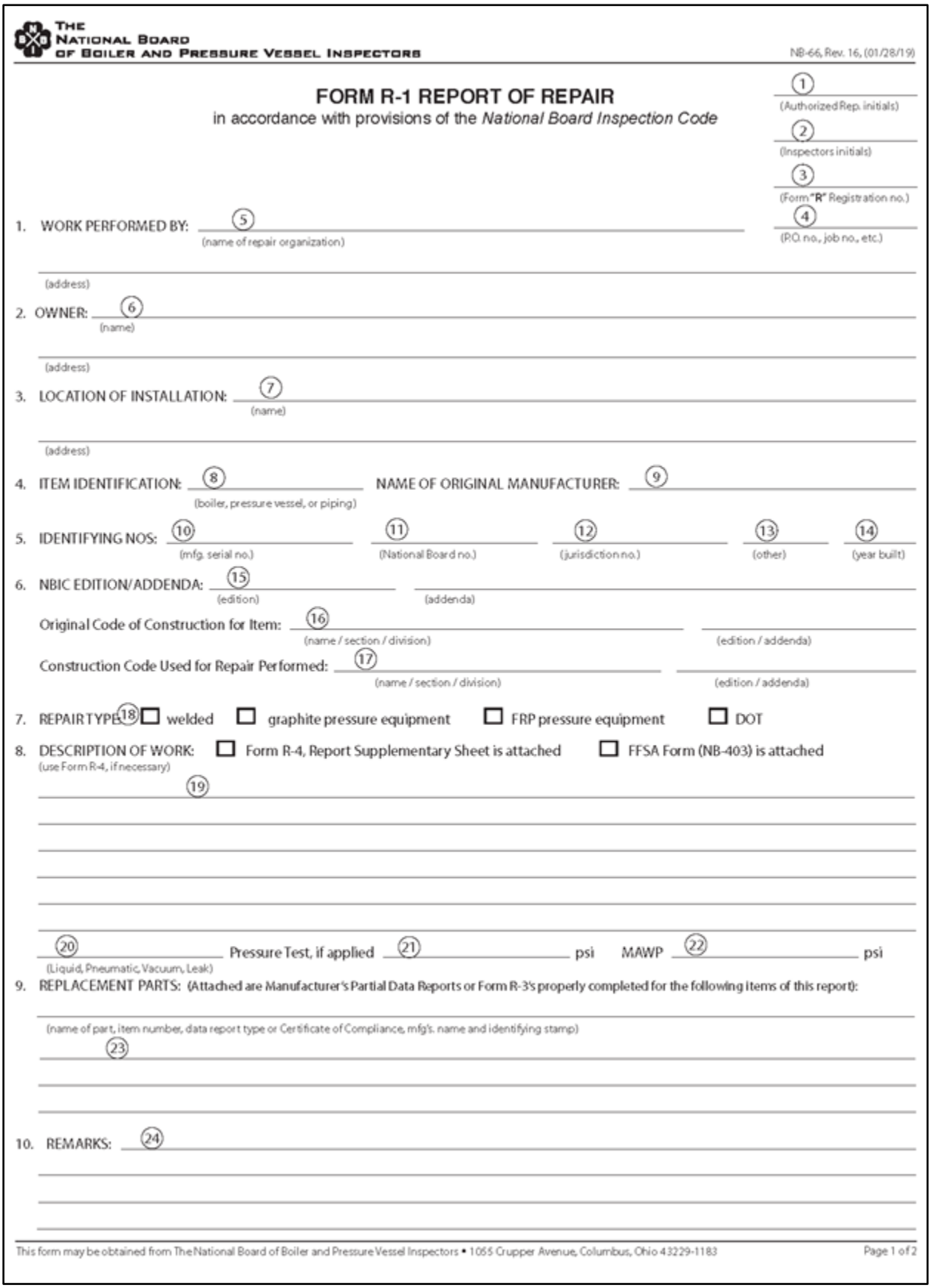
   1) Circled numbers on each of the forms refer to the items listed on the applicable guide. The parenthesized numbers in the guides correspond to circled numbers on the forms.

   2) Numbers without circles appearing in the guides identify specific line or item numbers of the forms.

c) When computer generated, the format of the form shall replicate the type and relative location of the information depicted on the applicable form for the specific requirements as indicated on the top of each form. Note that a fillable version of all forms is available on the National Board website.

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

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



THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

NB-66, Rev. 16, (01/28/19)

FORM R-1 REPORT OF REPAIR

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

(1) (Authorized Rep. initials)

(2) (Inspectors initials)

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

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

1. WORK PERFORMED BY: (5) (name of repair organization)

(address)

2. OWNER: (6) (name)

(address)

3. LOCATION OF INSTALLATION: (7) (name)

(address)

4. ITEM IDENTIFICATION: (8) (boiler, pressure vessel, or piping) NAME OF ORIGINAL MANUFACTURER: (9)

5. IDENTIFYING NOS: (10) (mfg. serial no.) (11) (National Board no.) (12) (jurisdiction no.) (13) (other) (14) (year built)

6. NBIC EDITION/ADDENDA: (15) (edition) (addenda)

Original Code of Construction for Item: (16) (name / section / division) (edition / addenda)

Construction Code Used for Repair Performed: (17) (name / section / division) (edition / addenda)

7. REPAIR TYPE: (18) ☐ welded ☐ graphite pressure equipment ☐ FRP pressure equipment ☐ DOT

8. DESCRIPTION OF WORK: (use Form R-4, if necessary) ☐ Form R-4, Report Supplementary Sheet is attached ☐ FFSA Form (NB-403) is attached

(19)

(20) (Liquid, Pneumatic, Vacuum, Leak) Pressure Test, if applied (21) psi MAWP (22) psi

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

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

(23)

10. REMARKS: (24)

This form may be obtained from The National Board of Boiler and Pressure Vessel Inspectors • 1055 Crupper Avenue, Columbus, Ohio 43229-1183 Page 1 of 2

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

THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

NB-66, Rev. 16, (01/28/19)

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

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

CERTIFICATE OF COMPLIANCE

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

Repair Organization: (30) _____

Signed: (31) _____
(authorized representative)

Date: (32) _____

CERTIFICATE OF INSPECTION

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

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

Signed: (39) _____
(Inspector)

Date: (40) _____

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TABLE S9.2

GUIDE FOR COMPLETING FORM R-1, REPORT OF REPAIR, NB-66

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

TABLE S9.2 Cont'd

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

TABLE S9.2 Cont'd

Reference to Circled Numbers in the Form	Description
(37)	Indicate month, day, and year of final inspection by Inspector. For routine repairs this shall be the month, day, and year the Inspector reviews the completed routine repair package.
(38)	Inspector's National Board commission number and endorsement that qualifies the Inspector to sign this report, and when required by the Jurisdiction, the applicable State or Provincial numbers.
(39)	Signature of Inspector.
(40)	Indicate month, day, and year of Inspector signature

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

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

THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

NB-229, Rev. 8, (12/07/16)

FORM R-2 REPORT OF ALTERATION

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

(1) (Authorized Rep. initials)

(2) (Inspectors initials)

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

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

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

(address)

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

(address)

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

(address)

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

(address)

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

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

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

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

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

7a. DESCRIPTION OF DESIGN SCOPE: ☐ Form R-4, Report Supplementary Sheet is attached

(19)

7b. DESCRIPTION OF CONSTRUCTION SCOPE: ☐ Form R-4, Report Supplementary Sheet is attached

(20)

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

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

THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

NB-229, Rev. 8, (12/07/16)

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

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

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

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

(26)

9. REMARKS: (27)

DESIGN CERTIFICATION

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

Date (31), (32) Signed (33)

(name of design organization) (authorized representative)

CERTIFICATE OF DESIGN CHANGE REVIEW

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

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

Date (38) Signed (39) Commissions (40)

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

CONSTRUCTION CERTIFICATION

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

Date (44), (45) Signed (46)

(name of alteration organization) (authorized representative)

CERTIFICATE OF INSPECTION

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

Date (52) Signed (53) (54)

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

TABLE S9.3

GUIDE FOR COMPLETING FORM R-2, REPORT OF ALTERATION, NB-226

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

TABLE S9.3 Cont'd

Reference to Circled Numbers in the Form	Description
(19)	Provide a detailed summary of the scope of design that was performed. When additional space is required to describe the design scope, a Form R-4 shall be used and attached (check box if needed).
(20)	Indicate type of pressure test applied (liquid, pneumatic, vacuum, leak). If no pressure test applied, indicate "none."
(21)	Indicate test pressure applied.
(22)	Indicate maximum allowable working pressure (MAWP) for the pressure retaining item. (As altered)
(23)	When registering a Form R-2 with the National Board, this line is solely designated for a unique sequential number assigned by the "R" Certificate Holder. As described in NBIC Part 3, Paragraph 5.6, a log shall be maintained identifying unique and sequentially numbered Form "R" reports that are registered with the National Board. For rerating only, the Design Organization registers the Form R-2.
(24)	If applicable, document the unique purchase order, job, or tracking number assigned by organization performing work.
(25)	As applicable, identify what parts manufactured by welding or bonding were introduced as needed to complete the scope of work. Indicate part, item number, manufacturer's name, stamped identification, and data report type or Certificate of Compliance.
(26)	Indicate any additional information pertaining to the work involved (e.g. code cases, interpretations used).
(27)	Type or print name of the National Board "R" *Certificate of Authorization* authorized representative responsible for design certification.
(28)	Indicate National Board "R" *Certificate of Authorization* number.
(29)	Indicate month, day, and year that the "R" *Certificate of Authorization* expires.
(30)	Indicate month, day, and year the alteration was certified.
(31)	Record the name of National Board "R" *Certificate of Authorization* holder who performed the design portion of the work, using full name as shown on the "*Certificate of Authorization*" or an abbreviation acceptable to the National Board.
(32)	Signature of National Board "R" *Certificate of Authorization* authorized representative for the design change.
(33)	Type or print the name of Inspector certifying the design review.
(34)	Indicate Inspector's Jurisdiction.
(35)	Indicate Inspector's employer.
(36)	Indicate type of pressure test applied (liquid, pneumatic, vacuum, leak). If no pressure test applied, indicate "none."
(37)	Indicate address of Inspector's employer (city and state or province).
(38)	Indicate the month, day and year of the design certification by the Inspector.
(39)	Signature of the Inspector certifying the design review.

TABLE S9.3 Cont'd

Reference to Circled Numbers in the Form	Description
(40)	Inspectors National Board commission number and endorsement that qualifies the Inspector to sign this report, and when required by the Jurisdiction, the applicable State or Provincial numbers.
(41)	Type or print name of the National Board "R" *Certificate of Authorization* authorized representative responsible for any construction.
(42)	Indicate the National Board "R" *Certificate or Authorization* number.
(43)	Indicate month, day, and year the National Board "R" *Certificate of Authorization* expires.
(44)	Indicate the date the alteration was certified.
(45)	Record the name of National Board "R" *Certificate of Authorization* holder who performed the construction portion of the described work, using full name as shown on the *Certificate of Authorization* or an abbreviation acceptable to the National Board.
(46)	Signature of National Board "R" *Certificate of Authorization* authorized representative.
(47)	Type or print the name of Inspector certifying the construction inspection.
(48)	Indicate the Inspector's Jurisdiction.
(49)	Indicate Inspector's employer.
(50)	Indicate address of Inspector's employer (city and state or province).
(51)	Indicate the month, day and year of the final inspection by the Inspector.
(52)	Indicate the month, day and year the completed Form R-2 was signed by the Inspector.
(53)	Signature of the Inspector certifying the construction inspection.
(54)	Inspector's National Board commission number and endorsement that qualifies the Inspector to sign this report, and when required by the Jurisdiction, the applicable State or Provincial numbers.

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

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

THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

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

FORM R-3 REPORT OF PARTS FABRICATED BY WELDING

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

(1) (Authorized Rep. initials)

(2) (Inspectors initials)

(3) (Form "**R-3**" Registration no.)

1. MANUFACTURED BY: (4) (name of "**R**" certificate holder) (5) (P.O. no., job no., etc.)

(address)

2. MANUFACTURED FOR: (6) (name)

(address)

3. DESIGN CONDITION SPECIFIED BY: (7) CODE DESIGN BY: (8)

4. DESIGN CODE: (9) (10) (11) (12)

5. REPAIR/ALTERATION/MODIFICATION ACTIVITIES

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

6. DESCRIPTION OF PARTS

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

7. REMARKS: (30)

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

THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

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

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

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

CERTIFICATE OF COMPLIANCE

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

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

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

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

CERTIFICATE OF INSPECTION

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

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

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

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

TABLE S9.4

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

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

TABLE S9.4 Cont'd

Reference to Circled Numbers in the Form	Description
(23)	Indicate nominal thickness of plate and minimum thickness after forming.
(24)	Indicate shape as flat, dished, ellipsoidal, or hemispherical.
(25)	Indicate minimum thickness after forming.
(26)	Indicate the complete material specification number and grade for the head or end.
(27)	Indicate outside diameter.
(28)	Indicate minimum thickness of tubes.
(29)	Indicate the complete material specification number and grade for tubes.
(30)	Indicate any additional information pertaining to the work involved (e.g. code cases). The part manufacturer is to indicate the extent he has performed any or all of the design function. If only a portion of the design, state which portion.
(31)	When registering a Form R-3 Report with the National Board, this line is solely designated for a unique sequential number assigned by the "R" Certificate Holder. When the "R" Form is not to be registered, indicated so by "N/A". As described in NBIC Part 3, Paragraph 5.6, a log shall be maintained identifying unique and sequentially numbered Form "R" reports that are registered with the National Board.
(32)	If applicable, document the unique purchase order, job, or tracking number assigned by organization performing work.
(33)	Type or print name of authorized representative of the "R" Certificate Holder attesting to accuracy of the work described.
(34)	Indicate National Board "R" Certificate of Authorization number.
(35)	Indicate month, day, and year that the "R" Certificate of Authorization expires.
(36)	Indicate the date the repair was certified.
(37)	Record name of "R" Certificate Holder who performed the described work, using full name as shown on the Certificate of Authorization or an abbreviation acceptable to the National Board.
(38)	Signature of National Board "R" Certificate of Authorization authorized representative.
(39)	Type or print name of Inspector.
(40)	Indicate Inspector's Jurisdiction.
(41)	Indicate Inspector's employer.
(42)	Indicate address of Inspector's employer (city and state or province).
(43)	Indicate month, day, and year of final inspection by Inspector.
(44)	Indicate the month, day and year the completed Form "R" was signed by the Inspector.
(45)	Signature of Inspector.
(46)	Inspector's National Board commission number and endorsement that qualifies the Inspector to sign this report, and when required by the Jurisdiction, the applicable State or Provincial numbers.

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

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

THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

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

FORM R-4 REPORT SUPPLEMENT SHEET

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

(1) _____
(form "R" referenced)
(2) _____
(P.O. no., job no., etc.)

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

2. OWNER: (4) _____
(name)
(address)

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

REFERENCE LINE NO. (7)	CONTINUED FROM FORM R-(6) (8)

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

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

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

TABLE S9.5

GUIDE FOR COMPLETING FORM R-4, REPORT SUPPLEMENT SHEET, NB-231

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

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

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

THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

NB-81, Rev. 8, (03/30/17)

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

CATEGORY OF ACTIVITY: 1 ☐ 2 ☐ 3 ☐

☐ REPAIR/REPLACEMENT ☐ RE-RATING

(2) (NR Form Registration No.)

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

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

(address)

2. OWNER: (4)
(name)

(address)

3. NAME, ADDRESS, AND IDENTIFICATION OF NUCLEAR FACILITY:
(5)
(name)

(address)

(unit identification)

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

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

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

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

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

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

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

11. REMARKS: (15)

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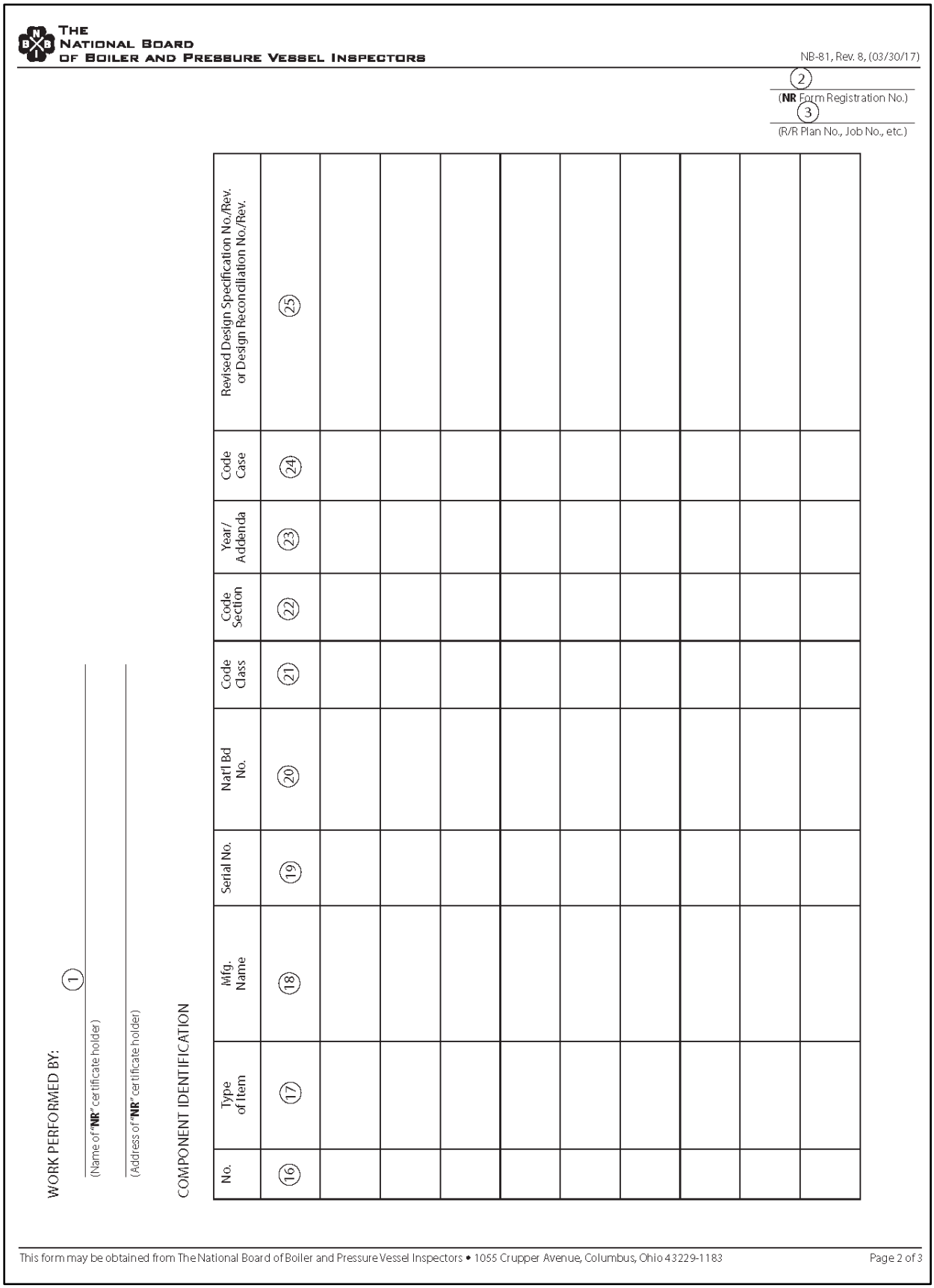
FIGURE S9.6.2
FORM NR-1, PAGE 2 OF 3



THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

NB-81, Rev. 8, (03/30/17)

(2) (NR Form Registration No.)

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

WORK PERFORMED BY: (1)

(Name of "NR" certificate holder)

(Address of "NR" certificate holder)

COMPONENT IDENTIFICATION

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

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Page 2 of 3

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

THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

NB-81, Rev. 8, (03/30/17)

(**NR** Form Registration No.)

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

CERTIFICATE OF COMPLIANCE

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

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

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

Title: (33) _____
(authorized representative)

CERTIFICATE OF INSPECTION

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

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

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

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TABLE S9.6

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

Reference to Circled Numbers in the Form	Description
	Title Block: Check type of activity, repair/replacement and/or rerating, as applicable.
	Check category of activity, 1, 2, or 3, as described in Part 3, Paragraph 1.6.2.
(1)	Name and address of the organization, as shown on the National Board "NR" Certificate of Authorization, which performed the activity.
(2)	Indicate NR Form Registration Number.
(3)	Indicate the repair/replacement plan, job number, etc., as applicable, assigned by the organization that performed the work for traceability to documentation.
(4)	Name and address of the owner of the nuclear facility.
(5)	Name and address of the nuclear power plant and, if applicable, identification of the unit.
(6)	Identify the system or component (e.g., residual heat removal, reactor coolant) with which the repair/replacement and/or re-rating activity is associated.
(7)	Identify the original design specification number and revision for the system or component listed in line 4.
(8)	Identify the original construction code, edition/addenda used for the system or component identified in line 4.
(9)	NBIC Edition used for performing activities specified on this form.
(10)	Organization having responsibility for design when there is a change from the original design specification.
(11)	Identify code edition/addenda used for design, when applicable.
(12)	Check the type of test conducted (e.g., hydrostatic, pneumatic, system leakage, exempt, or other) and indicate the pressure applied when applicable.
(13)	Indicate the number of components where work was performed. Each component shall be indicated on page 2 of the form NR-1.
(14)	Provide a detailed summary describing the scope of work completed. Information to be considered should include type of work (welding, brazing, fusing), location, steps taken for removal or acceptance of defects, examinations, testing, heat treat, and other special processes or methods utilized. If Necessary, attach additional data, sketch, drawing, Form R-4, etc. In the remarks section state if additional data is attached.
(15)	Indicate any additional information pertaining to the work, including manufacturer's data reports.
(16)	Number in sequence beginning with No. 1 to identify each component work was performed. This number may be used to correspond with the detailed description of work performed.
(17)	Identify the type of item. i.e. piping, pump, valve, etc.
(18)	Identify the manufacturer's name of component.
(19)	Identify the manufacturer's serial no. or other assigned number for traceability.
(20)	Identify the National Board registration number, if previously assigned.
(21)	Identify the code class criteria, as assigned for each component.

(22)	Identify the code section used to perform work.

TABLE S9.6 Cont'd

Reference to Circled Numbers in the Form	Description
(23)	Identify Code section year and/or addenda used to perform work.
(24)	Identify any code cases used for work performed.
(25)	Identify any revisions to be made to the design specifications or if any design reconciliations were performed.
(26)	Type or print name of authorized representative from the certificate holder.
(27)	Name of the organization that performed the identified work, using the full name as shown on the Certificate of Authorization, or an abbreviation acceptable to the National Board.
(28)	Indicate code section as applicable to the repair/replacement activity and/or re-rating activity performed.
(29)	Indicate National Board Certificate of Authorization number.
(30)	Indicate month, day, and year the certificate expires.
(31)	Signature of authorized representative from the NR certificate holder.
(32)	Indicate month, day and year of signature by the Authorized Representative.
(33)	Title of authorized representative as defined in the Quality Program.
(34)	Type or print name of Authorized Nuclear Inspector.
(35)	Indicate the Jurisdiction where the activity is performed, when required.
(36)	Indicate Authorized Nuclear Inspector's employer.
(37)	Indicate month, day, and year of inspection by the Authorized Nuclear Inspector.
(38)	Signature of Authorized Nuclear Inspector.
(39)	Indicate month, day, and year of signature by the Authorized Nuclear Inspector.
(40)	National Board Commission number and required endorsements.

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

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

THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

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

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

(2) (NVR Form Registration No.)

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

CATEGORY OF ACTIVITY: 1 ☐ 2 ☐ 3 ☐

☐ REPAIR/REPLACEMENT ☐ RE-RATING

1. WORK PERFORMED BY: (1)
(name of "NVR" authorized organization)

(address)

2. WORK PERFORMED FOR: (4)
(name)

(address)

3. OWNER: (5)
(name)

(address)

4. NAME, ADDRESS, AND IDENTIFICATION OF NUCLEAR FACILITY: (6)
(name)

(address)/ (unit identification)

5. CODE APPLICABLE FOR INSERVICE INSPECTION: (7) (edition) (addenda) (code case(s))

6. CODE USED FOR REPAIR/REPLACEMENT ACTIVITY: (8) (edition) (addenda) (code case(s))

7. NBIC USED FOR REPAIR/REPLACEMENT ACTIVITY: (9) (edition)

8. DESIGN RESPONSIBILITY: (10)

9. **REPAIRED PRESSURE RELIEF DEVICE: SEE PAGE 2**

10. OPENING PRESSURE: (11) BLOWDOWN (if applicable): (12)

11. SET PRESSURE AND BLOWDOWN ADJUSTMENT MADE AT: (13) USING: (14)

12. DESCRIPTION OF WORK: (include name and identifying number of replacement parts):
(15)

12. REMARKS: (16)

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

THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

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

(2)
(**NR** Form Registration No.)
(3)
(R/R Plan No., Job No., etc.)

WORK PERFORMED BY: (1)

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

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

PRESSURE RELIEF DEVICE

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

CONSTRUCTION CODE

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

NAME AND IDENTIFYING NUMBER OF REPLACEMENT PARTS

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

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Page 2 of 3

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

THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

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

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

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

CERTIFICATE OF COMPLIANCE

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

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

CERTIFICATE OF INSPECTION

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

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

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

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

TABLE S9.7

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

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

TABLE S9.7 Cont'd

Reference to Circled Numbers in the Form	Description
(22)	Indicate the pressure relief device by inlet size, in inches.
(23)	Indicate the year the affected item was manufactured.
(24)	Indicate the name, section and division of the original construction code for the affected item.
(25)	Indicate the code class for the affected item as applicable, i.e. Class 1, 2 or 3.
(26)	Indicate the construction code edition for the affected item.
(27)	Indicate the construction code addenda, as applicable, for the affected item.
(28)	Indicate any applicable code cases used for manufacturing of the affected item.
(29)	Name of the replacement part.
(30)	Identifying number of the replacement part.
(31)	Number/quantity of each replacement part used.
(32)	Indicate the Serial number or other traceability used by the manufacturer of the replacement part.
(33)	Type or print name of authorized representative from the certificate holder.
(34)	Indicate code as applicable to the repair/replacement activity performed.
(35)	Indicate National Board Certificate of Authorization number, if applicable for the "VR" Stamp.
(36)	Indicate month, day, and year the certificate expires, if applicable for the "VR" Stamp.
(37)	Indicate National Board Certificate of Authorization number, if applicable for the "NR" Stamp.
(38)	Indicate month, day, and year the certificate expires, if applicable for the "NR" Stamp.
(39)	Signature of authorized representative from the certificate holder defined in item 27 above.
(40)	Indicate month, day, and year of signature by the authorized representative.
(41)	Title of authorized representative as defined in the Quality Program.
(42)	Type or print name of Authorized Nuclear Inspector.
(43)	Indicate the Jurisdiction where the activity is performed, when required.
(44)	Indicate Authorized Nuclear Inspector's employer.
(45)	Indicate address of Authorized Nuclear Inspector's employer (city and state or province).
(46)	Indicate month, day, and year of inspection by the Authorized Nuclear Inspector.
(47)	Signature of Authorized Nuclear Inspector defined in item 42 above.
(48)	Indicate month, day, and year of signature by the Authorized Nuclear Inspector.
(49)	National Board Commission number and required endorsements.

(19) **TABLE 1.5.1**

Form "R" Reports, Records, or Documents	Instructions	Minimum Retention Period
a) Form "R" Reports and supporting records and documentation	The organization performing repairs and alterations shall retain a copy of the completed "R" Form report on file, and all records substantiating the summary of work described in NBIC Part 3, ~~5.12.4.1~~ Tables S9.2 and S9.3 of Supplement 9, Item ~~12~~ 19, for a minimum of 5 years. When the method of repair described in NBIC Part 3, 3.3.4.8 is used, the record retention period shall be described in b).	5 years
b) Form "R" Report with REPORT OF FITNESS FOR SERVICE ASSESSMENT FORM (NB-403) attached.	When the method of repair described in NBIC Part 3,3.3.4.8 is used, the record retention period shall be for the duration described on the FITNESS FOR SERVICE ASSESSMENT (FFSA) Form required by the repair method and as described in NBIC Part 2, 4.4. Notes: 1. The "R" Certificate Holder should be aware that when used, some of the referenced codes and standards identified in NBIC Part 2,, 1.3 describe requirements for permanent record retention throughout the service life of each equipment item. 2. When the "R" Certificate Holder is not the owner or user of the equipment, the record retention period is limited to the FFSA-results described on line 8 of the Report of Fitness for Service Assessment Form (NB-403).	5 years or as described on line 8 as reported on Form NB-403; whichever period is longer.
c) Continuity records for a welder, welding operator, bonder, or cementing technician.	Minimally, continuity records for a welder, bonder, or cementing technician within the Certificate Holder's quality system shall be described and established at the time of the applicant's initial certificate review and demonstrated at each triennial review required thereafter.	As applicable to the scope of work identified on the *Certificate of Authorization*, the continuity records are subject to review during each National Board triennial certificate review. Continuity records shall be maintained for a minimum of 5 years.

3.3.4.6 PATCHES

a) Flush Patches

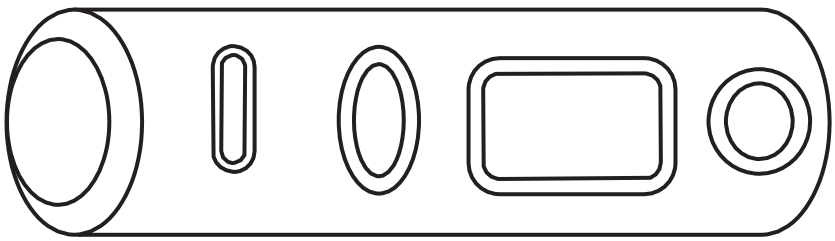
1) The weld around a flush patch shall be a full penetration weld and the accessible surfaces shall be ground flush where required by the applicable original code of construction. Examples of ~~flush welded~~ welded flush patches are shown in NBIC Part 3, Figure 3.3.4.6-a. ~~The welds shall be subjected to the nondestructive examination method used in the original code of construction or an alternative acceptable to the Inspector and, where required, the Jurisdiction.~~ Nondestructive examination ~~will~~ shall be performed in accordance with the requirements from NBIC Part 3, Section 4.2.

2) Before installing a flush patch, ~~the the~~ defective material ~~should should~~ shall be removed until sound material is reached. The patch ~~should should shallshall~~ be ~~rolled~~ formed to the proper shape or curvature. The edges ~~should should shallshall~~ align without overlap. In stayed areas, the weld seams should come between staybolt rows or riveted seams. Patches shall be made from a material whose composition and thickness meet the intended service. Patches may be any shape or size. If the patch is rectangular, a minimum radius of not less than three times the material thickness shall be provided at the corners. Square corners are not permitted. The completed welds shall meet the requirements of the original code of construction.

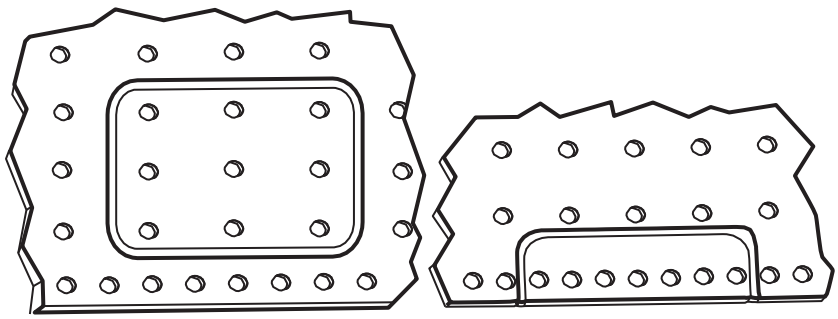
b) Tube Patches

In some situations it is necessary to weld a flush patch on a tube, such as when replacing tube sections and accessibility around the complete circumference of the tube is restricted, or when it is necessary to repair a small bulge. This is referred to as a window patch. Suggested methods for window patches are shown in NBIC Part 3, Figure 3.3.4.6-b.

FIGURE 3.3.4.6-a
FLUSH PATCH CONFIGURATIONS IN UNSTAYED AREAS



FLUSH PATCHES IN STAYED AREAS



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These changes have evolved from far more extensive changes initially. These changes were made in committee at the July 2019 Subcommittee on Repairs and Alterations. Made to standardize NDE requirements across the NBIC and to reference Part 3, Section 4.2 requirements. Also changes acceptance of alternative NDE methods from being subject only to the Inspector's approval and brings it under the jurisdiction AND the inspector.

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 ¾" 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 ¾ 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 ±10%.

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

QW-410.85 A change in the specified clearance between the tube and the tubesheet greater than ±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 ¾" 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 ¾" 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 19-11 – Edwards – ~~01-02-20~~1-13-2020

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Explanation of Need: Review the use of "Authorized Nuclear Inspection Agency" within the NBIC.

Background: An ANIA can not be an Inservice AIA since Endorsements for nuclear inspectors are issued only to new construction AIA's. The requirements for qualified Authorized Nuclear Inspectors/Supervisors are specified in NB-263, RCI-1. An NBIC revision is therefore needed to clarify reference to ANIAs in Part 3, 1.6.3 a) under the NR Accreditation Program.

This item was unanimously approved at SC-R/A but received 3 negatives on the MC ballot. There was some confusion in the original description of the proposed action in that reference was also made to revising the definition of "Authorized Nuclear Inspection Agency" in the Glossary (NBIC Parts 1, 2, 3, and 4). The MC negatives agreed with the proposal except that the action did not include a revision to the Glossary.

On further review, the current definition of "Authorized Nuclear Inspection Agency" in the Glossary is acceptable and does not require revision. The updated action for Item 19-11 is therefore to reaffirm revision to ¶1.6.3 a), to include reference to repair and alteration acceptance inspections and to delete reference to NB-369, and with no required change to the Glossary.

Upon discussion, the NR TG proposed rewording the proposed verbiage to replace "authorization" with "accreditation" to better align with the scope of the NB-360 Certificate.

Proposed Action: Revise Part 3, ¶1.6.3 a), as follows:

a) Have and maintain an inspection agreement with an Authorized Nuclear Inspection Agency accepted in accordance with NB-360, *National Board Acceptance of Authorized Inspection Agencies (AIA) Accredited by the American Society of Mechanical Engineers (ASME)*, with accreditation to perform repair and alteration acceptance inspections. ~~or accredited in accordance with NB-369, Accreditation of Authorized Inspection Agencies (AIA) Performing Inservice Inspection Activities and Qualification of Inspectors of Boilers and Pressure Vessels~~.

(Note to NBIC Secretary – The reference NBIC paragraph for Item 19-11 should be updated to reflect "NBIC Part 3, 1.6.3 a)" and the General Description revised to read "Clarify Reference to Authorized Nuclear Inspection Agencies")

Original Proposal – Information Only

Item 19-11 – Hellman – 7-15-2019

Location: Section 9 of Parts 1, 2, 3 and 4

Explanation of Need: Review the use of "Authorized Nuclear Inspection Agency" within the NBIC.

Background: An ANIA can not be an Inservice AIA since Endorsements for nuclear inspectors are issued only to new construction AIA's. The requirements for qualified Authorized Nuclear Inspectors/Supervisors are clearly specified in NB-263, RCI-1. Therefore revision to the Glossary definition is needed to clarify this requirement for the NR Accreditation Program.

Proposed Revision:

1.6.3 PREREQUISITES FOR ISSUING A NATIONAL BOARD "NR" CERTIFICATE OF

AUTHORIZATION

Before an organization can obtain a National Board "NR" Certificate of Authorization, the organization shall:

a) Have and maintain an inspection agreement with an Authorized Nuclear Inspection Agency accepted in accordance with NB-360, National Board Acceptance of Authorized Inspection Agencies (AIA) Accredited by the American Society of Mechanical Engineers (ASME) with authorization to perform repair and alteration acceptance inspections. ~~or accredited in accordance with NB-369, Accreditation of Authorized Inspection Agencies (AIA) Performing Inservice Inspection Activities and Qualification of Inspectors of Boilers and Pressure Vessels~~.
b) Have a written Quality Assurance Program that complies with the requirements of this section and address all controls for the intended category and scope of activities.
c) Have a current edition of the NBIC.

MC Negatives - Information Only

Committee Member:	Donnie LeSage	**Vote Date:**	2019-11-19	**Vote:**	Disapproved	**Uploads:**	
Member Comment:	I agree with Mr. Pillow. The Background stated "Therefore revision to the Glossary definition is needed". I don't see the proposed Glossary definition change.						

Committee Member:	James Pillow	**Vote Date:**	2019-10-30	**Vote:**	Disapproved	**Uploads:**	
Member Comment:	I agree with the proposed revision to 1.6.3, but the proposal does not include a revision to the Glossary as indicated in the Background.						

Committee Member:	Milton Washington	**Vote Date:**	2019-11-22	**Vote:**	Disapproved	**Uploads:**	
Member Comment:	I agree with Mr. Pillow that the proposal should include the glossary change as well.						

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 safe 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.

Item 19-55

7/9/2019

Request for NBIC Part 3, Section 4 Revision

Purpose	To change the maximum test pressure requirement when performing liquid pressure tests of repair and alteration activities. This proposal was initially part of item NB16-2603, which proposed changes to 4.4.1 a) 1) and 4.4.2 a) 1). However, only the changes to 4.4.1 a) 1) made it into the 2019 NBIC.
Scope:	To revise paragraph 4.4.2 a) 1) of the NBIC Part 3 to require maximum liquid test pressure be in accordance with the original construction Code.
Background	For liquid pressure testing of repairs and alterations, paragraph 4.4.2(a)(1) of the NBIC Part 3 require a maximum test pressure of 150% of the maximum allowable working pressure (MAWP) stamped on the pressure retaining item, as adjusted for temperature. However, repairs and alterations of DOT vessels are required to be tested at a minimum of 150% of design pressure which makes it virtually impossible to comply with the NBIC maximum requirement. Further, repairs and alterations to DOT ammonia transport vessels made from UHT materials require a test pressure of 200% of design pressure (49CFR 180.413(b)(6) and 177.337-16). Obviously, this is in violation of the NBIC Part 3. Paragraph UG-99 of ASME Section VIII, Div. 1 does not not specify a maximum test pressure for hydrostatic tests. Therefore, it is p[proposed that paragraph 4.4.2(a)(1) be revised to remove the maximum test pressure of 150% of MAWP. The paragraph will have new wording (similar to existing paragraph 4.4.1(b) for pneumatic testing) which states test pressure shall not to exceed the maximum test pressure of the original code of construction.
Proposed Revision	See page 2 for proposed revisions.

EXISTING PARAGRAPH 4.4.2(a)(1) of NBIC Part 3

4.4.2 TEST OR EXAMINATION METHODS APPLICABLE TO ALTERATIONS

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

a) Liquid Pressure Test

Pressure testing of alterations shall meet the following requirements:

1) A pressure test as required by the original code of construction shall be conducted. ~~The test pressure shall not exceed 150% of the maximum allowable working pressure (MAWP) stamped on the pressure retaining item, as adjusted for temperature.~~ When the original test pressure included consideration of corrosion allowance, the test pressure may be further adjusted based on the remaining corrosion allowance. The pressure test for replacement parts may be performed at the point of manufacture or point of installation;

PROPOSAL OF REVISION TO 4.4.2(a)(1)

1) A pressure test as required by the original code of construction shall be conducted. The test pressure shall not exceed the maximum liquid test pressure of the original code of construction. When the original test ~~[~~pressure included consideration of corrosion allowance, the test pressure may be further adjusted based on the remaining corrosion allowance. The pressure test for replacement parts may be performed at the point of manufacture or point of installation.

19-59 – Edwards – 12-23-19

Background – This Item is a proposed revision to Part 3, 3.2.2 e), as a result of an intent interpretation request under Item 19-34. The proposed interpretation was unanimously approved by SC-R/A but withdrawn at Main Committee pending action on a corresponding code revision. The original request and supporting information by the Inquirer are attached.

Proposed Action – Revise Part 3, 3.2.2 e), as follows:

e*) Replacement parts addressed by 3.2.2 c) or d) above shall receive a pressure test ~~as required by~~ at the pressure determined for the completed pressure equipment (boiler, pressure vessel, etc.) in accordance with the original code of construction. If replacement parts have not been pressure tested to this pressure ~~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 at the pressure determined for the completed pressure equipment in accordance with the original code of construction.*

INFORMATION ONLY

Inquiry No.	**19**
Source	GE
Subject	NB
Edition	20
Question	NB pre an hyc the det
Reply	Ye
Committee's Question	NB pre 3.2 the
Committee's Reply	Ye
Rationale	AS doc Ba *cor* req rev Th cla pre wh par
SC Vote	
NBIC Vote	
Negative Vote Comments	

INFORMATION ONLY

Background Materials Submi

NBIC Part 3 Section 3 paragrap
test as required by the original
consistently by all users of the
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this, the words "*... as required*
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think that was the Committee's
interpretation and proposed rev
"original code of construction" t
required when the original code

Proposed Intent Interpretation:
Question: NBIC Part 3 paragra
required by the original code of
does not provide rules for hydr
intent of 3.2.2 e) that the refere
pressure?
Reply: Yes.

Associated Revision:
e) Replacement parts addresse
pressure determined for the co
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~~construction~~ pressure test provi
one or a combination of the exa
or 4.4.2 (for alterations). The R
section of the R Form the exam
tested at the pressure determin
construction.

Background Information:

NBIC Part 3 Section 3 paragrap

e) Replacement parts addresse
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Section 4, paragraph 4.4.1 (f
for completing the R Form sh
test(s) performed, and the re
code of construction.

ASME Interpretation I-16-6

Standard Designation:	BPV I
Edition/Addenda:	2015
Para./Fig./Table No:	PW-54
Subject Description:	Section I Intent Interpre
Date Issued:	08/16/2016
Record Number:	13-942
Interpretation Number :	BPV I-16-6
Question(s) and Reply(ies):	Question: Is it the inten regarding hydrostatic t or alteration of existing Reply: No. Section I d to Existing Boilers.

INFORMATION ONLY

2017 Addition to PW-54

PW-54.4 Refer to A-64 as guidance for welded pressure parts supplied to the user of an existing boiler as replacement or repair parts. (17)

A-64

A-64 REPAIRS TO EXISTING BOILERS

Where repairs are necessary that in any way affect the working pressure or safety of a boiler, a state inspector, municipal inspector, or an inspector employed regularly by an insurance company, which is authorized to do a boiler insurance business in the state in which the boiler is used, shall be called for consultation and advice as to the best method of making such repairs; after such repairs are made they shall be subject to the approval of a state inspector, municipal inspector, or an inspector regularly employed by an insurance company that is authorized to do a boiler insurance business in the state in which the boiler is used.

Recommendation

NBIC Part 3 - Item #: 19-48

Calibration:

m) Calibration

The manual shall describe a system for the calibration of examination, measuring, and test equipment used in the performance of repairs and alterations.

At a minimum it shall include:

A) A Calibration System shall include the following:

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

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

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

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

5. A calibration record retention policy.

CURRENT TEXT

5.12.5.1

8) Identify the original construction code, edition/addenda used for the system or component identified in line 4.

PROPOSED REVISION

5.12.5.1

8) Identify the original construction code, section, edition/addenda and applicable code cases used for the system or component identified in line 4.

CURRENT TEXT

5.12.5.1

11) Identify code edition/addenda used for design, when applicable.

PROPOSED REVISION

5.12.5.1

11) Identify code, section, edition/addenda and applicable code cases used for design, when applicable.

CURRENT TEXT

5.12.5.1

23) Identify Code section year and/or addenda used to perform work.

PROPOSED TEXT

5.12.5.1

23) Identify Code section ~~year~~ edition and/or addenda used to perform work.

WORK PERFORMED BY:

(1)

(Name of "NR" certificate holder)

(Address of "NR" certificate holder)

COMPONENT IDENTIFICATION

Edition/

No.	Type of Item	Mfg. Name	Serial No.	Nat'l Bd No.	Code Class	Code Section	~~Year~~/ Addenda	Code Case	
(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	

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 19-91: Request for Revision to NBIC Part 3, 5.6

Purpose	Many "R" Certificate Holders now register R Forms in the National Board Electronic Data Transfer (EDT) System. The EDT system contains all of the required log information listed in paragraph 5.6 of Part 3, which makes it unnecessary and redundant for the "R" Cert. Holder to maintain a separate log.
Scope:	Part: Repairs and Alterations; Section: 5; Paragraph: 5.6
Background:	NBIC Part 3, paragraph 5.6 requires "R" Certificate Holders to maintain a log documenting all Forms registered with the National Board. The information required to be in the log are the the form's unique registration number, description of work performed, date of AIA acceptance, and date the report was submitted to the National Board.
Proposed Revision:	See below for the proposed revision.

5.6 FORM REGISTRATION LOG

"R" or "NR" Certificate Holders shall maintain a log or multiple logs documenting unique and sequentially numbered Form "R" Reports that are registered with the National Board. The logs shall include, as a minimum, each form's unique registration number, type (R-1, R-2, NR-1, etc.), description of work performed, date of acceptance by the Authorized Inspection Agency, and date the report was submitted to the National Board. As an alternative to the above requirement, the log may be maintained electronically in the National Board Electronic Data Transfer (EDT) System.

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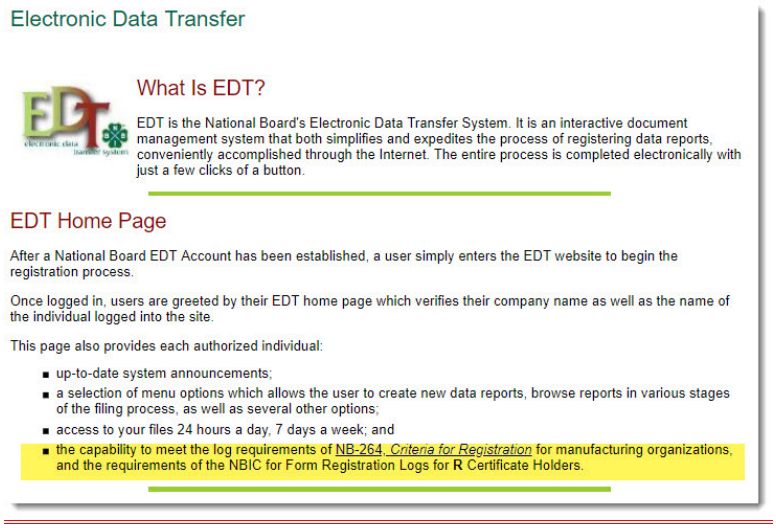


Electronic Data Transfer

What Is EDT?

EDT is the National Board's Electronic Data Transfer System. It is an interactive document management system that both simplifies and expedites the process of registering data reports, conveniently accomplished through the Internet. The entire process is completed electronically with just a few clicks of a button.

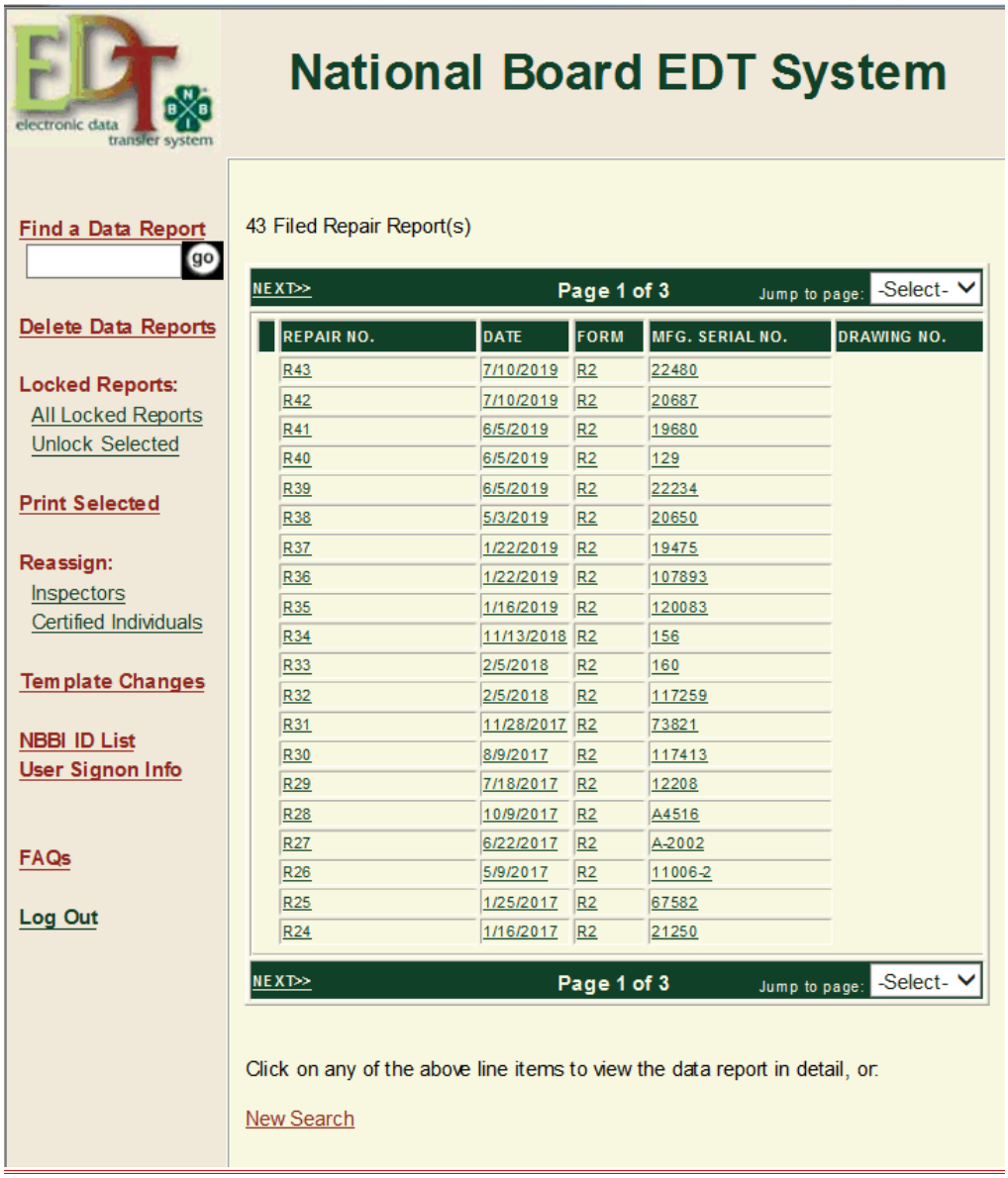
EDT Home Page

After a National Board EDT Account has been established, a user simply enters the EDT website to begin the registration process.

Once logged in, users are greeted by their EDT home page which verifies their company name as well as the name of the individual logged into the site.

This page also provides each authorized individual:

- up-to-date system announcements;
- a selection of menu options which allows the user to create new data reports, browse reports in various stages of the filing process, as well as several other options;
- access to your files 24 hours a day, 7 days a week; and
- the capability to meet the log requirements of NB-264, *Criteria for Registration* for manufacturing organizations, and the requirements of the NBIC for Form Registration Logs for **R** Certificate Holders.


National Board EDT System
electronic data transfer system
Find a Data Report
go
Delete Data Reports
Locked Reports:
All Locked Reports
Unlock Selected
Print Selected
Reassign:
Inspectors
Certified Individuals
Template Changes
NBBI ID List
User Signon Info
FAQs
Log Out
43 Filed Repair Report(s)
NEXT>>
Page 1 of 3
Jump to page: -Select-
REPAIR NO. DATE FORM MFG. SERIAL NO. DRAWING NO.
R43 7/10/2019 R2 22480
R42 7/10/2019 R2 20687
R41 6/5/2019 R2 19680
R40 6/5/2019 R2 129
R39 6/5/2019 R2 22234
R38 5/3/2019 R2 20650
R37 1/22/2019 R2 19475
R36 1/22/2019 R2 107893
R35 1/16/2019 R2 120083
R34 11/13/2018 R2 156
R33 2/5/2018 R2 160
R32 2/5/2018 R2 117259
R31 11/28/2017 R2 73821
R30 8/9/2017 R2 117413
R29 7/18/2017 R2 12208
R28 10/9/2017 R2 A4516
R27 6/22/2017 R2 A-2002
R26 5/9/2017 R2 11006-2
R25 1/25/2017 R2 67582
R24 1/16/2017 R2 21250
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Jump to page: -Select-
Click on any of the above line items to view the data report in detail, or:
New Search

Item 19-92: Request for Revision to NBIC Part 3, Table 2.3

Purpose	Add column and titles to Part 3, Table 2.3 for claritication.
Scope:	Part: Repairs and Alterations; Section: 2; Table 2.3
Background:	“Document Designation” is the name used by AWS Technical.
Proposed Revision:	See below for the proposed revision.

GMAW – Gas Metal Arc Welding	
Standard Welding Procedure Specification for 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. (3.2 mm) through 1 ½ in. (38 mm) Thick, ER70S-3, Flat Position Only, As-Welded or PWHT Condition, Primarily Pipe Applications.	B2.1-1-233: 2006
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. (3.2 mm) through 1 ½ in. (38 mm) Thick, ER70S-3, Flat Position Only, As-Welded or PWHT Condition, Primarily Pipe Applications.	B2.1-1-235: 2006
GTAW/SMAW Combination of Welding Processes	
TITLE	**DESIGNATION**
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. (3.2 mm) through 1 ½ in. (38 mm) Thick, ER70S-2 and E7018, As-Welded or PWHT Condition.	B2.1-1-021-94 and B2.1-1-021-94R
Standard Welding Procedure Specification for Gas Tungsten Arc Welding followed by Shielded Metal Arc Welding of Carbon Steel (M-1/P-1/S-1, Groups 1 or 2), 1/8 in. (3.2 mm) through 3/4 in. (19 mm) Thick, ER70S-2 and E7018, As-Welded or PWHT Condition, Primarily Pipe Applications.	B2.1-1-209-96
Standard Welding Procedure Specification for Gas Tungsten Arc Welding followed by Shielded Metal Arc Welding of Carbon Steel (M-1/P-1/S-1, Groups 1 or 2), 1/8 in. (3.2 mm) through 1 ½ in. (38 mm) Thick, ER70S-2 and E7018, As-Welded or PWHT Condition, Primarily Pipe Applications.	B2.1-1-209-96 (R2007)
Standard Welding Procedure Specification for Gas Tungsten Arc Welding (Consumable Insert) Followed by Shielded Metal Arc Welding of Carbon Steel (M-1/P-1/S-1, Group 1 or 2), 1/8 in. (3.2 mm) through 3/4 in. (19 mm) Thick, INMs1 and E7018, As-Welded or PWHT Condition, Primarily Pipe Applications.	B2.1-1-211-96
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. (3.2 mm) through 1 ½ in. (38 mm) Thick, INMs-1, ER70S-2, and E7018 As-Welded or PWHT Condition, Primarily Pipe Applications.	B2.1-1-211:2001 R2012
GMAW/FCAW – Combination of Welding Processes	
Standard Welding Procedure Specification for Argon Plus 25% Carbon Dioxide Shielded Gas Metal Arc Welding (Short Circuiting Transfer Mode) Followed by 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. (3.2 mm) through 1 ½ in. (38 mm) Thick, ER70S-3 and EXT-X, As-Welded or PWHT Condition, Primarily Pipe Applications.	B2.1-1-232:2006

Austenitic Stainless Steel — (M8/P8/S8 Materials)

SMAW — Shielded Metal Arc Welding	
Standard Welding Procedure Specification for Shielded Metal Arc Welding of Austenitic Stainless Steel (M-8/P-8/S-8, Group 1), 1/8 in. (3.2 mm) through 1½ in. (38 mm) Thick, As-Welded Condition.	B2.1-8-023-94

New Item: Item # _____; Update NBIC Part 3, Table 2.3 (2019 Edition) adding the following listed SWPSs

PROPOSED REVISION

Revise Table 2.3 with the addition of the following listed Revised SWPS's.

TABLE 2.3

*Title	*Designation
Standard Welding Procedure Specification (SWPS) for Shielded Metal Arc Welding of Carbon Steel (M-1/P-1, Group 1 or 2), 1/8" [3 mm] through 3/4 inch [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 (SWPS) for Shielded Metal Arc Welding of Carbon Steel (M-1/P-1, Group 1 or 2), 1/8" [3 mm] through 3/4 inch [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 (SWPS) for Shielded Metal Arc Welding of Carbon Steel (M-1/P-1, Group 1 or 2), 1/8" [3 mm] through 3/4 inch [19 mm] Thick, E6010 (Vertical Uphill), in the As-Welded Condition, Primarily Pipe Applications.	**B2.1-1-203: 2019**
Standard Welding Procedure Specification (SWPS) for Shielded Metal Arc Welding of Carbon Steel (M-1/P-1, Group 1 or 2), 1/8" [3 mm] through 3/4 inch [19 mm] Thick, E6010 (Vertical Downhill Root with the Balance Vertical Uphill), in the As-Welded Condition, Primarily Pipe Applications.	**B2.1-1-204: 2019**
Standard Welding Procedure Specification (SWPS) for Shielded Metal Arc Welding of Carbon Steel (M-1/P-1, Group 1 or 2), 1/8" [3 mm] through 1-1/2 inch [38 mm] Thick, E6010 (Vertical Uphill) Followed by E7018 (Vertical Uphill), in the As-Welded Condition or PWHT Condition, Primarily Pipe Applications.	**B2.1-1-205: 2019**
Standard Welding Procedure Specification (SWPS) for Shielded Metal Arc Welding of Carbon Steel (M-1/P-1, Group 1 or 2), 1/8" [3 mm] through 1-1/2 inch [38 mm] Thick, E6010 (Vertical Downhill) Followed by E7018 (Vertical Uphill), in the As-Welded Condition or PWHT Condition, Primarily Pipe Applications.	**B2.1-1-206: 2019**
Standard Welding Procedure Specification (SWPS) for Gas Tungsten Arc Welding of Carbon Steel (M-1/P-1, Group 1 or 2), 1/8" [3 mm] through 1-1/2 inch [38 mm] Thick, ER70S-2, in the As-Welded Condition or PWHT Condition, Primarily Pipe Applications.	**B2.1-1-207: 2019**
Standard Welding Procedure Specification (SWPS) for Shielded Metal Arc Welding of Carbon Steel (M-1/P-1, Group 1 or 2), 1/8" [3 mm] through 1-1/2 inch [38 mm] Thick, E7018, in the As-Welded Condition or PWHT Condition, Primarily Pipe Applications.	**B2.1-1-208: 2019**

Standard Welding Procedure Specification (SWPS) for Gas Tungsten Arc Welding Followed by Shielded Meal Arc Welding of Carbon Steel (M-1/P-1, Group 1 or 2), 1/8" [3 mm] through 1-1/2 inch [38 mm] Thick, ER70S-2 and E7018, in the As-Welded Condition or PWHT Condition, Primarily Pipe Applications.	**B2.1-1-209: 2019**

- **Info only pending adoption of Item 19-92**