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*THE NATIONAL BOARD  
OF BOILER AND PRESSURE VESSEL INSPECTORS*

# **NATIONAL BOARD INSPECTION CODE SUBCGROUP REPAIRS & ALTERATIONS**

## **AGENDA**

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Meeting of January 18<sup>th</sup>, 2022  
San Diego, CA

The National Board of Boiler & Pressure  
Vessel Inspectors 1055 Crupper Avenue  
Columbus, Ohio 43229-  
1183  
Phone: (614)888-8320  
FAX: (614)847-1828

- 1. Call to Order**  
8:00 AM Pacific Time. For those attending in person, the meeting will be held in Versailles Ballroom on the second floor of the hotel.
- 2. Introduction of Members and Visitors**
- 3. Check for a Quorum**
- 4. Awards/Special Recognition**
- 5. Announcements**
  - The National Board will be hosting a reception on Wednesday evening from 5:30pm to 7:30pm at The Smoking Gun.
  - The National Board will be hosting breakfast and lunch on Thursday. Breakfast will be served from 7:00am to 8:00am, and lunch will be served from 11:30am to 12:30pm. Both meals will be served at the hotel in Le Fontainebleau.
  - A coffee station will be provided outside of the meeting rooms on each floor.
- 6. Adoption of the Agenda**
- 7. Approval of the Minutes of the July 13<sup>th</sup>, 2021 Meeting**  
The minutes are available for review on the National Board website, [www.nationalboard.org](http://www.nationalboard.org).
- 8. Review of Rosters (Attachment Page 1)**
  - a. Membership Nominations**
    - i. Mr. Raymond Spuhl would like to be considered for Subgroup R&A membership/ He is currently a member of the NR Task Group.
  - b. Membership Reappointments**
  - c. Officer Nominations**

## 9. Action Items

<b>Item Number: 17-134</b>	<b>NBIC Location: Part 3, Section 5</b>	<b>No Attachment</b>
<p><b>General Description:</b> Proposed Revision for registration of Form R-1 with the National Board containing ASME pressure part data reports attached.</p> <p><b>Subgroup:</b> Repairs and Alterations</p> <p><b>Task Group:</b> P. Shanks (PM), Rob Troutt, Joel Amato, Kathy Moore, Paul Edwards</p> <p><b>July 2020 Meeting Action:</b> Mr. P. Shanks presented a Progress Report.</p> <p><b>SG R&amp;A Action:</b> Progress Report</p> <p><b>SC ACTION:</b> Mr. Shanks presented a <b>Progress Report</b>.</p> <p><b>Meeting Action:</b> Paul Shanks proposed that this item be <b>Closed w/No Action</b> (Closed w/NA). The proposal was motioned, seconded, and unanimously approved.</p>		

<b>Item Number: 19-60</b>	<b>NBIC Location: Part 3, 1.5.1</b>	<b><a href="#">Attachment 2</a></b>
<p><b>General Description:</b> Quality System For Qualification For The National Board “R” Certificate</p> <p><b>Subgroup:</b> Repairs and Alterations</p> <p><b>Task Group:</b> K. Moore (PM), Paul Davis, B. Boseo, M. Toth, P. Shanks, M. Quisenberry, R. Sturm, T. Seime</p> <p><b>Explanation of Need:</b> Part 3, 1.5.1 provides a good outline for a Quality Systems Manual. However, the remaining elements of a Quality System, outside of the one’s currently being addressed in Item 19- 47 and 19-4 need to be embellished to provide a more auditable description of each element.</p> <p><b>July 2020 Meeting Action:</b> Ms. K. Moore presented a <b>Progress Report</b>.</p> <p><b>SG R&amp;A Action:</b> Item 20-68 (Certifications) was incorporated into this Item (19-60) and is to be Closed w/No Action. Item 20-92 (Mech. Assembly vs Repair procedures) was added to this Item (19-60) and Closed w/No Action.</p> <p><b>SC ACTION:</b> K. Moore presented a <b>Progress Report</b>.</p> <p><b>Update:</b> This item was approved by Subcommittee R&amp;A by letter ballot 05/21/21 (14-0).</p> <p><b>Meeting Action:</b> K. Moore presented. Mr. J. Sekely pointed out that comments made on the last version submitted via LB were not addressed on the current proposal. The item was taken back to make the appropriate revisions. <b>This was a PR.</b></p> <p><b>Update:</b> This item is currently being balloted to SC R&amp;A.</p>		

<b>Item Number: 19-61</b>	<b>NBIC Location: Part 3, 3.3.4</b>	<b>No Attachment</b>
<p><b>General Description:</b> Threaded Inserts as Alterations Example</p> <p><b>Subgroup:</b> Repairs and Alterations</p> <p><b>Task Group:</b> Paul Shanks (PM), J. Walker, T. McBee</p> <p><b>Explanation of Need:</b> Threaded insert are being used to fix a bolt that has broken off on certain types of boilers (autoclaves) which hold the heating elements in the water side of the boiler. When this happens, the technician correcting the problem will simply drill out the broken bolt with an over sized bit and inset a metallic insert. NBIC does address this this type of alteration.</p> <p><b>SG R&amp;A Action:</b> Progress Report</p> <p><b>SC ACTION:</b> Mr. Shanks presented a Progress Report.</p> <p><b>Meeting Action:</b> Mr. Shanks presented a <b>Progress Report</b>.</p>		

<b>Item Number: 20-48</b>	<b>NBIC Location: Part 3, 1.6</b>	<b>No Attachment</b>
<p><b>General Description:</b> Review NR Program (1.6) to 2015 NQA-1 Edition</p> <p><b>Subgroup:</b> Repairs and Alterations</p> <p><b>Task Group:</b> P. Edwards (PM)</p> <p><b>Explanation of Need:</b> Latest NQA-1 revision to be compared to NR program (1.6) for consistency.</p> <p><b>SG R&amp;A Action:</b> Progress Report</p> <p><b>SC ACTION:</b> Mr. Edwards presented a <b>Progress Report</b>.</p> <p><b>Meeting Action:</b> Mr. Edwards presented a <b>Progress Report</b>.</p>		

<b>Item Number: 20-52</b>	<b>NBIC Location: Part 3, 1.6.2 a) 2)</b>	<b>No Attachment</b>
<p><b>General Description:</b> Rvw NR requirements for ASME Section XI Div. 2 potential applications</p> <p><b>Subgroup:</b> Repairs and Alterations</p> <p><b>Task Group:</b> T. Roberts (PM), P. Edwards</p> <p><b>Explanation of Need:</b> This was created based on discussion from Item 20-47 dealing with ANIA requirements.</p> <p><b>SG R&amp;A Action:</b> Progress Report</p> <p><b>SC ACTION:</b> Mr. Edwards presented a <b>Progress Report</b>.</p> <p><b>Meeting Action:</b> Mr. Edwards presented a <b>Progress Report</b>.</p>		

<b>Item Number: 20-53</b>	<b>NBIC Location: Part 3, 3.3.5.2 a) &amp; 3.4.5.1 b)</b>	<b>No Attachment</b>
<p><b>General Description:</b> Certification of Repair or Alteration Plans</p> <p><b>Subgroup:</b> Repairs and Alterations</p> <p><b>Task Group:</b> S. Chestnut (PM)</p> <p><b>Explanation of Need:</b> The Clarification of the Certifying Engineer requirements.</p> <p><b>SG R&amp;A Action:</b> Progress Report</p> <p><b>SC ACTION:</b> Mr. Chestnut presented a <b>Progress Report</b>.</p> <p><b>Meeting Action:</b> Scott Chestnut presented a <b>Progress Report</b> – Ben Schaefer volunteered forTG. During discussion, B. Underwood stated the 2021 ASME Sect. VIII may address this.</p>		

<b>Item Number: 20-60</b>	<b>NBIC Location: Part 3, 3.3.4.8</b>	<b>No Attachment</b>
<p><b>General Description:</b> Part 3 Supplement for FFS Guidelines</p> <p><b>Subgroup:</b> Repairs and Alterations</p> <p><b>Task Group:</b> J. Siefert (PM)</p> <p><b>Explanation of Need:</b> The NBIC provides little guidance related to FFS activities and repairs in part 3.</p> <p><b>SG R&amp;A Action:</b> Progress Report</p> <p><b>SC ACTION:</b> Mr. Siefert presented that EPRI will be drafting a FFS Supplement for consideration in the future. This was a <b>Progress Report</b>.</p> <p><b>Meeting Action:</b> Mr. Siefert presented that EPRI will be drafting a FFS Supplement for consideration in the future. This was a <b>Progress Report</b>.</p>		

<b>Item Number: 20-67</b>	<b>NBIC Location: Part 3, S6</b>	<b>No Attachment</b>
<p><b>General Description:</b> Revisions to Part 3, Supplement 6</p> <p><b>Subgroup:</b> Repairs and Alterations</p> <p><b>Task Group:</b> R. Underwood (PM), T. McBee, G. Galanes</p> <p><b>Explanation of Need:</b> Supplement 6 was implemented into the 2007 Edition of the NBIC Part 3 to provide requirements and guidelines for repairs, alterations and modifications to DOT Transport Tanks using the National Board's "TR" Program (which was never implemented). S6 has been revised over the years to remove reference to the "TR" Program, but still contains many requirements that are not correct. This purpose of this proposal is to review the entire Supplement and make appropriate revisions that comply with NBIC Part 3 and DOT requirements.</p> <p><b>SG R&amp;A Action:</b> Progress Report</p> <p><b>SC ACTION:</b> Mr. Underwood presented a <b>Progress Report</b>.</p> <p><b>July SG R&amp;A Meeting Action:</b> Mr. Underwood presented a Progress Report.</p> <p><b>Meeting Action:</b> Mr. Underwood presented a <b>Progress Report</b>.</p>		

<b>Item Number: 20-73</b>	<b>NBIC Location: Part 3, 4.4.2 a) 2)</b>	<b>No Attachment</b>
<p><b>General Description:</b> Pressure Testing of Connecting Welds (Part 3, 4.4.2(a)(2))</p> <p><b>Subgroup:</b> Repairs and Alterations</p> <p><b>Task Group:</b> R. Underwood (PM)</p> <p><b>Explanation of Need:</b> To clarify what the term "replacement part" as used in 4.4.2(a)(2) of Part 3 means.</p> <p><b>SG R&amp;A Action:</b> The proposal was revised and Unanimously Approved.</p> <p><b>SC ACTION:</b> Mr. Underwood presented a proposal which was motioned, seconded and <b>Unanimously Approved</b>.</p> <p><b>Update:</b> At the Jan 2021 meeting, Main Committee requested that the task group take the proposal back for further work.</p> <p><b>July SG R&amp;A Meeting Action:</b> B. Underwood – PR – Waiting on related Item 21-12 outcome</p> <p><b>Meeting Action:</b> B. Underwood presented a <b>PR</b>, as he is waiting on related Item 21-12 outcome which may address this revision.</p>		

<b>Item Number: 20-83</b>	<b>NBIC Location: Part 3, 1.5.1 s) &amp; 9.1</b>	<b>Attachment 9</b>
<p><b>General Description:</b> Revision to Part 3, 3.2.2 e)</p> <p><b>Subgroup:</b> Repairs and Alterations</p> <p><b>Task Group:</b> T. Hellman</p> <p><b>Explanation of Need:</b> Action Item 19-60 is proposing revisions/additions to all of 1.5.1. This proposal is to move the definition of "Nonconformance" out of the current 1.5.1 s) paragraph and into the glossary.</p> <p><b>SG R&amp;A Action:</b> The proposal was Unanimously Approved and will be sent to Parts 1, 2, 3, and 4 SC as a Rvw and Comment LB</p> <p><b>SC ACTION:</b> Mr. Hellman presented and motioned for the proposal <b>to be sent to all SC (Parts 1, 2, 3, and 4) as a Rvw and Comment LB.</b> The motion was Unanimously Approved.</p> <p><b>Update:</b> SC R&amp;A (8-0) and MC (7-0) Rvw and Comment LB in progress till 07/06</p> <p><b>July SG R&amp;A Meeting Action:</b> T. Hellman presented a proposal that was unanimously approved.</p> <p><b>Meeting Action:</b> T. Hellman presented a proposal to go to a <b>Review and Comment LB to all SC (Parts 1-4) and Main Committee.</b></p> <p><b>Update:</b> The proposal was balloted to SC R&amp;A, PRD, and Installation. The ballot passed Installation and R&amp;A but failed PRD. IT is currently being balloted to Inspection.</p>		
<b>Item Number: 21-02</b>	<b>NBIC Location: Part 3, 1.6</b>	<b>No Attachment</b>
<p><b>General Description:</b> Define "Fuel Loading" as it pertains to NR activities</p> <p><b>Subgroup:</b> Repairs and Alterations</p> <p><b>Task Group:</b> P. Edwards (PM)</p> <p><b>Explanation of Need:</b> The NR TG would like to clarify "Fuel Loading" as used to determine Category 1, 2 or 3 NR activities.</p> <p><b>Meeting Action:</b> P. Edwards - PR</p>		

<b>Item Number: 21-06</b>	<b>NBIC Location: Part 3, 4.4.2</b>	<b>No Attachment</b>
<p><b>General Description:</b> Concessions with pressure testing associated with replacement parts</p> <p><b>Subgroup:</b> Repairs and Alterations</p> <p><b>Task Group:</b> D. Kinney (PM), R. Miletti, P. Becker, P. Davis, R. Underwood, M. Winters</p> <p><b>Explanation of Need:</b> When replacement parts are manufactured and not tested as required by the original code of construction, there needs to be concessions or considerations associated with the pressure testing requirements as to not detrimentally effect the existing pressure retaining item.</p> <p><b>Meeting Action:</b> D. Kinney presented - T. Sieme and B. Wielgozinski had several comments and volunteered to join the TG. After discusstion, Mr. Kinney pulled the proposal back for more work. This was a PR</p>		
<b>Item Number: 21-07</b>	<b>NBIC Location: Part 3, 1.3.2 a)</b>	<b>Attachment 10</b>
<p><b>General Description:</b> NBIC Report Form certification clarification.</p> <p><b>Subgroup:</b> Repairs and Alterations</p> <p><b>Task Group:</b> D. Kinney (PM)</p> <p><b>Explanation of Need:</b> The intent is to clarify which Inspector must certify R forms, specifically when there are different AIA's signing the certifications on the R-2 Form.</p> <p><b>Meeting Action:</b> D. Kinney presented a <b>PR</b>. T. Seime volunteered to join the TG to assist Mr. Kinney on this item.</p>		

<b>Item Number: 21-10</b>	<b>NBIC Location: Part 3, 5.2 &amp; 5.4</b>	<b><a href="#">Attachment 11</a></b>
<p><b>General Description:</b> Add a time frame for R forms (for completion of and submittal of forms)</p> <p><b>Subgroup:</b> Repairs and Alterations</p> <p><b>Task Group:</b> D. Kinney ( PM), B. Schaefer, B. McGuire</p> <p><b>Explanation of Need:</b> Currently, the NBIC is silent on how much time may go by after work is completed before the applicable R Form is accepted by the inspector after work is completed. The NBIC is also silent on how much time may go by before the applicable R Form is submitted to the NB and Jurisdictions (as applicable).</p> <p><b>SG R&amp;A Action:</b> Progress Report – waiting to see outcome of Item 20-15 for Routine Repair stamping</p> <p><b>SC ACTION:</b> Mr. Troutt presented a <b>Progress Report</b>.</p> <p><b>July SG R&amp;A Meeting Action</b> – New TG: D. Kinney ( PM), B. Schaefer, B. McGuire, - this was a PR</p> <p><b>Meeting Action</b> – With Mr. Troutt stepping down from the SG R&amp;A, a new TG for this item was established with the following volunteers: D. Kinney ( PM), B. Schaefer, B. McGuire, - this was a <b>PR</b>.</p>		

<b>Item Number: 21-12</b>	<b>NBIC Location: Part 3, 3.3.3, 3.4.4, Section 9</b>	<b>No Attachment</b>
<p><b>General Description:</b> Clarify the definitions and examples of “Repair” and “Alteration”</p> <p><b>Subgroup:</b> Repairs and Alterations</p> <p><b>Task Group:</b> P. Becker (PM), K. Moore, P. Shanks, R. Underwood, M. Chestnut, T. Seime</p> <p><b>Explanation of Need:</b> Clarify the definitions of “Repair” and “Alteration” in the Glossary and revise the list of examples of each to better define the allowable scope of activities.</p> <p><b>History:</b> This Item was created as a result of conversation regarding Interp. Item 20-78 and Action Item 20-54</p> <p><b>SG R&amp;A Action:</b> Progress Report</p> <p><b>SC ACTION:</b> Ms. Becker presented a <b>Progress Report</b>.</p> <p><b>Meeting Action:</b> P. Becker presented a presentation (placed on SG R&amp;A Cloud).- This was a PR.</p>		

<b>Item Number: 21-14</b>	<b>NBIC Location: Part 3, 3.4.3</b>	<b>No Attachment</b>
<p><b>General Description:</b> ASME PCC-2 article references are incorrectly formatted</p> <p><b>Subgroup:</b> Repairs and Alterations</p> <p><b>Task Group:</b> P. Shanks (PM)</p> <p><b>Explanation of Need:</b> The 2018 edition of ASME PCC-2 has a different article numbering system than that used in the 2019 NBIC.</p> <p><b>July SG R&amp;A Meeting Action –</b> P. Shanks - PR</p> <p><b>Meeting Action:</b> P. Shanks presented a <b>PR</b>.</p>		

<b>Item Number: 21-15</b>	<b>NBIC Location: Part 3, Section 5</b>	<b>No Attachment</b>
<p><b>General Description:</b> Corrections and revisions to "R" Forms.</p> <p><b>Subgroup:</b> Repairs and Alterations</p> <p><b>Task Group:</b> D. Kinney (PM)</p> <p><b>Explanation of Need:</b> NBIC Part 3 is silent on controls for corrections or revisions to "R" Forms. The NBIC requires quality systems to provide revision controls, and I believe the NBIC should be clear on this as well.</p> <p><b>Meeting Action:</b> D. Kinney presented: The proposal was revised and taken back for more work. M. Toth was added to the TG – <b>This was a PR</b></p>		

<b>Item Number: 21-27</b>	<b>NBIC Location: Part 3, 4.2 a)</b>	<b>Attachment 12</b>
<p><b>General Description:</b> Provision of Exemption for original COC NDE requirements</p> <p><b>Subgroup:</b> Repairs and Alterations</p> <p><b>Task Group:</b> W. Sperko (PM)</p> <p><b>Explanation of Need:</b> Repair organizations that perform shop refurbishment and repair of LPG storage tanks (ASME Section VIII Div 1) encounter repetitive, typical defects that require repair. Many of the typical defects requiring repair meet the definition and could be considered Routine Repair. This being the case one of the frequently observed issues requiring weld repair is defects in original manufacturing butt welds at the head to shell joint with defects that include cold lap, and pinholes. The typical repair involves the excavation of the defect and confirmation of removal via PT. Then the excavation is welded with a typical repair length being less than 6" long. While the CoC in many cases in LPG storage tanks requires a spot RT of the head to shell joint, performing RT on the minimal amount of welding typically performed on isolated defects serves no practical purpose in enhancing safety especially when the length of deposited weld metal would be less than the length of the length of the radiographic film used capture the image.</p> <p><b>Meeting Action:</b> W. Sperko presented. The proposal was revised and will be sent to <b>Letter Ballot to all SC and MC.</b></p> <p><b>Update:</b> The proposal was balloted to SC R&amp;A and received several comments that the PM will discuss during the meeting.</p>		
<b>Item Number: 21-31</b>	<b>NBIC Location: NBIC Glossary</b>	<b>No Attachment</b>
<p><b>General Description:</b> Revise definition of "Field"</p> <p><b>Subgroup:</b> Repairs and Alterations</p> <p><b>Task Group:</b> R. Milette (PM), P. Gilston, M. Toth, J. Walker</p> <p><b>Explanation of Need:</b> A "Field" site under the current definition could be multiple rented or leased spaces used for repairs/alterations, where there is no single or specific customer or job, but rather the locations(s) are used for conducting repair/alteration activities by personnel employed by the Certificate Holder on a continual basis.</p> <p><b>July SG R&amp;A Meeting Action:</b> The proposal was revised, and a TG was assigned: R. Milette (PM), P. Gilston, M. Toth, - PR</p> <p><b>Meeting Action:</b> R. Milette presented that this was a new Item and adding a definition of "shop" may provide more clarity on this. J. Walker volunteered to be on the TG, - This was a <b>PR</b></p>		

<b>Item Number: 21-33</b>	<b>NBIC Location: Part 3, 1.2 f)</b>	<b><a href="#">Attachment 13</a></b>
<p><b>General Description:</b> Use of code cases pertaining to repairs and alterations</p> <p><b>Subgroup:</b> Repairs and Alterations</p> <p><b>Task Group:</b> R. Underwood (PM)</p> <p><b>Explanation of Need:</b> The NBIC Part 3 already references code cases in various paragraphs such as NR quality requirements, welding method 7, and R Form instructions, but there is no direct reference to acceptance of their use. I think it's always been an unwritten rule that they are permitted to be used with acceptance of the Inspector and Jurisdiction. This proposal will address this in a new paragraph 1.2(f).</p> <p><b>July SG R&amp;A Meeting Action:</b> R. Underwood presented – The proposal was revised and a motion to send to Rvw &amp; Comment LB to SG and SC R&amp;A was UA.</p> <p><b>Meeting Action:</b> R. Underwood presented – The proposal will be sent to <b>Rvw &amp; Comment LB to SG and SC R&amp;A.</b></p>		

**New Items:**

<b>Item Number: 21-37</b>	<b>NBIC Location: Part 3, 1.6</b>	<b>No Attachment</b>
<p><b>General Description:</b> Parts used in NR Activities</p> <p><b>Subgroup:</b> Repairs and Alterations</p> <p><b>Task Group:</b> B. Wielgoszinski (PM)</p> <p><b>Explanation of Need:</b> Clarification that parts used in NR activities are fabricated by NR Certificate Holders and inspected by appropriately endorsed National Board commissioned Inspectors.</p> <p><b>January 2022 Meeting Action:</b></p>		

<b>Item Number: 21-43</b>	<b>NBIC Location: Part 3, Glossary</b>	<b><a href="#">Attachment 15</a></b>
<p><b>General Description:</b> Defining and revising "Practicable" and "Practical" within the NBIC</p> <p><b>Subgroup:</b> Repairs and Alterations</p> <p><b>Task Group:</b> M. Toth (PM)</p> <p><b>Explanation of Need:</b> Defining and revising Practicable and Practical within the NBIC and revising where applicable</p> <p><b>January 2022 Meeting Action:</b></p>		

<b>Item Number: 21-44</b>	<b>NBIC Location: Part 3, Glossary</b>	<a href="#"><b>Attachment 16</b></a>
<p><b>General Description:</b> Defining "De-Rating" within Part 3</p> <p><b>Subgroup:</b> Repairs and Alterations</p> <p><b>Task Group:</b> M. Toth (PM)</p> <p><b>Explanation of Need:</b> Defining de-rating within Part 3</p> <p><b>January 2022 Meeting Action:</b></p>		

<b>Item Number: 21-45</b>	<b>NBIC Location: Part 3, Supplements</b>	<a href="#"><b>Attachment 17</b></a>
<p><b>General Description:</b> Add a supplement to address oil, gas and chemical repair &amp; alteration scope</p> <p><b>Subgroup:</b> Repairs and Alterations</p> <p><b>Task Group:</b> R. Underwood (PM)</p> <p><b>Explanation of Need:</b> There has been interest from companies operating with the Oil, Gas and Chemical industries to address certain types of repairs that may exist in ASME PCC-2 or API. NBIC does not have many of these repair methods within the book.</p> <p><b>January 2022 Meeting Action:</b></p>		

<b>Item Number: 21-53</b>	<b>NBIC Location: Part 3, S8.5 a)</b>	<a href="#"><b>Attachment 19</b></a>
<p><b>General Description:</b> Post Repair Inspection of weld repairs to CSEF steels</p> <p><b>Subgroup:</b> Repairs and Alterations</p> <p><b>Task Group:</b> P. Gilston (PM)</p> <p><b>Explanation of Need:</b> The requirement for Inspector involvement in post-repair inspections to CSEF weld repairs is to ensure future safe operation of the boiler. This is a function of the inservice Authorized Inspection Agency, not the Repair Inspector, whose duties end with completion of repair documentation.</p> <p><b>January 2022 Meeting Action:</b></p>		

<b>Item Number: 21-67</b>	<b>NBIC Location: Part 3, 3.4.9</b>	<a href="#"><b>Attachment 20</b></a>
<p><b>General Description:</b> Add welding requirements to plugging firetubes</p> <p><b>Subgroup:</b> Repairs and Alterations</p> <p><b>Task Group:</b> None assigned.</p> <p><b>Explanation of Need:</b> The current NBIC does not have enough direction or requirements for welding tube plugs in firetubes.</p> <p><b>January 2022 Meeting Action:</b></p>		
<b>Item Number: 21-68</b>	<b>NBIC Location: Part 3, S9</b>	<a href="#"><b>Attachment 21</b></a>
<p><b>General Description:</b> Removal of "final inspection" date from all Form R Report certifications.</p> <p><b>Subgroup:</b> Repairs and Alterations</p> <p><b>Task Group:</b> D. Kinney (PM)</p> <p><b>Explanation of Need:</b> To remove the unnecessary date requirement and eliminate confusion regarding what is the "final inspection" as it relates to repairs and alterations. The term "final inspection" is not defined in the NBIC, and the corresponding date has no bearing on the act and intent of the form certification.</p> <p><b>January 2022 Meeting Action:</b></p>		
<b>Item Number: 21-70</b>	<b>NBIC Location: Part 3, Table 2.3</b>	<a href="#"><b>Attachment 51</b></a>
<p><b>General Description:</b> Updating Table 2.3 in Part 3 with newest SWPSs</p> <p><b>Subgroup:</b> Repairs and Alterations</p> <p><b>Task Group:</b> J. Sekely (PM)</p> <p><b>Explanation of Need:</b> 13 SWPSs have been updated and approved by AWS, and the list of SWPSs in Table 2.3 will need to be updated to reflect these changes.</p> <p><b>January 2022 Meeting Action:</b></p>		

<b>Item Number: 21-71</b>	<b>NBIC Location: Part 3, 3.4.9</b>	<a href="#"><b>Attachment 52</b></a>
<p><b>General Description:</b> Remove the mechanical portion of tube plugging from 3.3.4.9. Only address i</p> <p><b>Subgroup:</b> Repairs and Alterations</p> <p><b>Task Group:</b> None assigned.</p> <p><b>Explanation of Need:</b> Removing the mechanical portion of the text. Many Jurisdictions are having a difficult time enforcing that part of the NBIC</p> <p><b>January 2022 Meeting Action:</b></p>		

<b>Item Number: 21-77</b>	<b>NBIC Location: Part 3, 3.3.6</b>	<a href="#"><b>Attachment 54</b></a>
<p><b>General Description:</b> Repairs/Alterations of Impact Tested Vessels</p> <p><b>Subgroup:</b> Repairs and Alterations</p> <p><b>Task Group:</b> None assigned.</p> <p><b>Explanation of Need:</b> There is an urgent need to address these concerns as the repair firms cannot comply with the existing wording in 3.3.6. The plan is to incorporate this item into the 2023 Edition of Part 3 and propose a corresponding Intent Interpretation that would provide guidance to NBIC users as soon as possible.</p> <p><b>January 2022 Meeting Action:</b></p>		

<b>Item Number: 21-80</b>	<b>NBIC Location: Part 3, 3.3.3 h) 2)</b>	<b>Attachment</b>
<p><b>General Description:</b> Mechanical Replacement of Shell or Head</p> <p><b>Subgroup:</b> Repairs and Alterations</p> <p><b>Task Group:</b> None assigned.</p> <p><b>Explanation of Need:</b> This Code revision (corresponding to interpretation item 21-79) would provide clarity to NBIC users and address whether mechanical replacement of these components is considered a repair.</p> <p><b>January 2022 Meeting Action:</b></p>		

<b>Item Number: 21-82</b>	<b>NBIC Location: Part 3, 3.3.3 s)</b>	<b><a href="#">Attachment 56</a></b>
<p><b>General Description:</b> Examples of Repairs</p> <p><b>Subgroup:</b> Repairs and Alterations</p> <p><b>Task Group:</b> R. Underwood (PM).</p> <p><b>Explanation of Need:</b> Adding "repair" to 3.3.3(s) would then address use of different weld material. Currently 3.3.3(s) only addresses replacement of the part, not repair (Repair is addressed in 3.3.3(r)).</p> <p><b>January 2022 Meeting Action:</b></p>		

## 10. Future Meetings

- July 2022 – TBD
- January 2023 – TBD

## 11. Adjournment

Respectfully submitted,

*Terrence Hellman*

Terrence Hellman

SG R&A Secretary

Boseo	Brian	General Interest	Chair	07/30/2023	<a href="#">Details</a>
Schaefer	Benjamin	National Board Certificate Holders	Vice Chair	07/30/2023	<a href="#">Details</a>
Hellman	Terrence		Secretary	12/30/2099	<a href="#">Details</a>
Chestnut	Scott	Users	Member	07/30/2023	<a href="#">Details</a>
Davis	Paul	Manufacturers	Member	07/30/2023	<a href="#">Details</a>
Frazier	Steven	Jurisdictional Authorities	Member	07/30/2024	<a href="#">Details</a>
Gilston	Philip	Manufacturers	Member	07/20/2024	<a href="#">Details</a>
Hopkins	Craig	National Board Certificate Holders	Member	01/30/2023	<a href="#">Details</a>
Johnson	Frank	Users	Member	01/30/2024	<a href="#">Details</a>
Kinney	Donald	Jurisdictional Authorities	Member	01/30/2024	<a href="#">Details</a>
McBee	Timothy	Authorized Inspection Agencies	Member	10/30/2022	<a href="#">Details</a>
Miletti	Ray	Manufacturers	Member	07/30/2024	<a href="#">Details</a>
Moore	Kathy	National Board Certificate Holders	Member	01/30/2024	<a href="#">Details</a>
Morelock	Brian	Users	Member	01/30/2024	<a href="#">Details</a>
Quisenberry	Michael	National Board Certificate Holders	Member	07/30/2024	<a href="#">Details</a>
Seime	Trevor	Jurisdictional Authorities	Member	07/30/2023	<a href="#">Details</a>
Sekely	James	General Interest	Member	07/30/2024	<a href="#">Details</a>
Shanks	Paul	Authorized Inspection Agencies	Member	10/30/2022	<a href="#">Details</a>
Siefert	John	General Interest	Member	07/30/2024	<a href="#">Details</a>
Sperko	Walter	General Interest	Member	01/30/2023	<a href="#">Details</a>
Sturm	Rick	Jurisdictional Authorities	Member	01/30/2023	<a href="#">Details</a>
Toth	Marty	General Interest	Member	01/30/2023	<a href="#">Details</a>
Underwood	Robert	Authorized Inspection Agencies	Member	10/30/2022	<a href="#">Details</a>
Valdez	Rick	Manufacturers	Member	08/30/2023	<a href="#">Details</a>
Walker	Jamie	National Board Certificate Holders	Member	07/30/2024	<a href="#">Details</a>
White	Tom	Users	Member	01/30/2024	<a href="#">Details</a>

## 1.5 QUALITY SYSTEM

A holder of a National Board *Certificate of Authorization* shall have and maintain a written Quality System. The Quality System shall identify the processes necessary to satisfactorily meet the requirements of the NBIC and shall be available for review. The Quality System may be in the form of a manual and may consist of several documents~~brief or voluminous~~, depending on the projected scope of work. The Quality System~~it~~ shall be treated confidentially by the National Board.

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

The following is a guide for identifying features~~is a guide for required features which should be covered in the written Quality System as outlined in this section and of a Quality System which shall be included in the organization's Quality System Manual. As a minimum, each organization shall be address documented the required features~~ relative to the scope of work ~~to be performed by within the Certificate Holder's within the Organization's Quality System, shall explain their~~ intent, capability and applicability for each required feature shall be stated~~outlined in this section~~. Work may be subcontracted provided the necessary controls are clearly defined for maintaining full responsibility for code compliance by the National Board ~~repair organization~~Certificate Holder certifying the work.

#### a) Title Page

The title page shall contain the organization's Certificate Holder's legal name, accepted abbreviation, physical address, and scope of activities~~Scope of Work.~~

The scope of work shall clearly indicate the type of repairs and/or alterations the Certificate Holder is capable of and intends to carry out. The scope of work indicated shall include the following, as applicable.

- Repairs Only at either Shop or Field or Both
- Alterations Only at either Shop or Field or Both
- Repairs and Alterations at either Shop or Field or Both
- Metallic Repairs
- Non-Metallic Repairs
- Design Only

#### b) Content Page

The Quality System shall contain a page listing the contents of the manual by section, number (if applicable), revision level, and date of each section, as required for manual control. The content page shall list the activities described for in the Quality System so that each subject or document, number (if applicable), and revision level is clearly identified.

#### c) ~~Scope of Work~~

The scope of work shall clearly indicate the type of repairs and/or alterations the Certificate Holder organization is capable of and intends to carry out. The scope of work indicated shall include the following, as applicable.

Repairs Only at either Shop or Field or Both  
Alterations Only at either Shop or Field or Both  
Repairs and Alterations at either Shop or Field or Both  
Metallic Repairs  
Non-Metallic Repairs  
Design Only

dc) Statement of Authority and Responsibility

A ~~dated~~ dated ~~Statement of Authority and Responsibility, signed by a senior management official of the organization,~~ shall clearly identify that the be included in the Quality System has the full support of management and endorsed by signature of a senior management official. Further, ~~the~~ The Statement shall also include:

- 1) A statement that all repairs or alterations carried out by the Certificate Holder organization shall meet the requirements of the NBIC and the Jurisdiction, as applicable;
- 2) The title of the individual who has the authority and responsibility charged with the development and ensuring the Quality System is implementation of the Quality System and as described, and confirming the freedom to identify quality problems, and to initiate, recommend and provide solutions and when required, stop or prohibit work from continuing.
- 3) A statement that if there are conflicts or is a disagreements with in the implementation of the Quality System, will shall be brought to the attention of the Certificate Holder's organization's senior management official the matter is to be referred for a resolution to a higher authority and shall be resolved in a manner that will not conflict with code, jurisdiction/regulatory authority or Quality System requirements; ~~and.~~

ed) Manual Quality System Control

The Quality System manual shall define how ~~include the necessary provisions for revisions~~ g of individual subject sections, exhibits or documents will be identified, and how distribution and retrieval issuing documents will be achieved to ensure keep the manual current only the latest accepted revisions are available for use. In addition, the following shall be documented:

- 1) The title of the individual responsible for the preparation and authorized to approve ale of the Quality System including review of code editions, standards, and jurisdictional requirements.
- 2) revisions shall be included in the manual. Acceptance from the Revisions must be accepted by the Authorized Inspection Agency prior to issuance and implementation of the Quality System manual and its implementation.

fe) Certification

When electronic certification of documents is used, the Quality System shall include provisions describing the controls and safe guards that are employed to ensure the integrity of the certification.

gf) Organization

The Quality System shall include A an organizational chart which shall be described included for in the manual. It shall reflects actual levels of authority- and lines of communication associated with the functional job titles identified.- In addition, roles and responsibilities associated with the functional job titles identified within the organizational chart Quality System, include the title of the heads of all departments or divisions that perform functions that can affect the quality of the repair or alteration, shall be clearly defined and documented.- and it shall show the relationship between each department or division. The manual shall identify the title of those individuals responsible for preparation, implementation, or verification of the Quality System. The responsibilities shall be clearly defined and the

individuals shall have the organizational freedom and authority to fulfill those responsibilities. The following activities shall be documented :

- ~~— Responsibilities associated with the Authorized Inspection Agency (AIA) of record.~~
- ~~— Protocol describing when the AIA of record cannot provide coverage.~~
- ~~— Personnel performing supervisory activities for procedure and performance qualifications shall:~~

~~(a) be designated by the organization with responsibility for certifying qualification documents.~~

~~(b) have a satisfactory level of competence in accordance with the organization's quality program.~~

~~(c) have a record, maintained by the organization, containing objective evidence of the qualifications, training, or experience.~~

#### ghg) Drawings, Design and Specifications

The ~~manual~~Quality System shall contain controls to ensure that all applicable design information, ~~applicable~~ drawings, ~~design~~ calculations, specifications, and instructions are prepared or obtained, controlled, and interpreted in accordance with the scope of work and the original code of construction, including:-

- ~~• Initiation of job~~unique identifying -numbers and control of associated work.
- ~~• Define~~Description of the -scope of work.
- ~~• Performance and approval of design including title of approver.~~
- ~~• Drawings and other pertinent information (i.e., Code Edition, pressure, temperature, minimum design metal temperature, nondestructive examination (NDENDE), heat treatment, weld details, etc.)~~
- ~~• Review of design calculations, drawings, material specifications and process control sheets with Inspector to obtain acceptance.~~
- ~~• Revision and distribution control of design documents~~

#### ihh) Repair and Alteration Methods

~~The manual~~Quality System 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. The Quality System 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, and when required, the jurisdiction. -

#### iji) Materials

The ~~manual~~Quality System shall describe the method used to ensure that only acceptable materials (including welding material) are used for repairs and alterations. The Quality System~~manual~~ shall include a description of how existing material is identified and new material is ordered, verified, and identified. The Quality System~~manual~~ shall identify the title of the individual(s) responsible for each function and a brief description of how the function is to be performed.

~~kj) Method of Performing Work~~

~~The Quality System manual shall describe the methods for performing and documenting repairs and alterations in sufficient detail to permit the Inspector to determine at what stages specific inspections are to be performed. The method of repair or alteration must have prior acceptance of the Inspector. It is also essential that the Quality System include provisions to ensure safe working conditions during welding, testing, and all activities related to repairs and alterations.~~

~~jk) Welding, NDE and Heat Treatment~~

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

~~Welding—~~

~~The Quality System manual is to shall indicate identify the title(s) of the individual(s) responsible for development of the welding procedure specification (WPS), and its qualification, and the qualification of welders and welding operators. It is essential that only Only qualified welding procedure specification WPS's and welders or welding operators qualified will shall, as required by the NBIC, be used in the repair or alteration of pressure-retaining items. It is also essential that welders and welding operators maintain their eContinuity for welders and welding operators will be maintained proficiency as required by the NBIC, while engaged in the repair or alteration of pressure-retaining items. The manual Quality System shall also describe controls for ensuring that the required WPS or Standard Welding Procedure Specification (SWPS) is available to the welder or welding operator prior to welding and establish the basis for welder to weld traceability.~~

~~NOTE: For qualification of welders and welding procedures to the 2019 ASME Code or later, the Quality System shall identify the title and qualifications of personnel performing supervisory activities as defined in ASME Section IX as applicable. Similar responsibility for nondestructive examination and heat treatment shall be described in the manual.~~

~~k) Nondestructive examination NDE —~~

~~The title(s) of the individual(s) responsible to determine the type and extent of NDE required for the repair and/or alteration shall be identified. It is also essential that this manual The Quality System shall indicate identify the title(s) of the individual(s) responsible for the review and acceptance of subcontracted NDE procedures and personnel. When NDE is performed in-house, the title(s) of the individual(s) responsible for the written practice and the standard used for the basis of training, qualification, and records shall be documented.~~

~~l) Heat treatment~~

~~—The manual Quality System shall indicate identify the title(s) of the individual(s) responsible to ensure that a proper heat treatment has been applied to the repair and/or alteration. The Quality System shall indicate identify the title(s) of the individual(s) responsible for the review and acceptance of subcontracted heat treatment procedures and personnel. It is also essential that the The use of alternative welding methods per the NBIC, Part 3, 2-5-3 shall be described in the Quality System.~~

~~lmkm) Examinations and Tests~~

~~The Quality System Reference shall describe the process used to ensure that all required examinations and tests have been successfully performed and made available to the Inspector for acceptance be made in the manual for examinations and tests upon completion~~

of the repair or alteration, prior to signing the Form "R" Report and accepted by the Inspector.

7

mnln) Calibration

The Quality Systemmanual shall describe a system for the calibration of examination, measuring, and test equipment used in the performance of repairs and alterations. At a minimum, it shall include:

- 1) Examination, measuring, and test equipment, subject to calibration, shall have a unique identification number and a calibratedion date as well as a specified next calibration due date.
- 2) The methodology of how the various equipment will be calibrated.
- 3) The title of the person(s) responsible for the the-calibration system-of-the-equipment.
- 4) A statement that all calibrations will be traceable to the National Institute of Standards and Technology (NIST) or another nationally recognized Standards Organization, as much as practical.described

omon) Approval, Inspection,Authorization and Acceptance-and-Inspection of Repair and/or Alteration

The Quality Systemmanual shall specifically ~~indicate state~~ that before the work is started, ~~acceptance authorization of the repair/alteration plan and acceptance of the method(s) used~~ shall be obtained from ~~an the~~ Inspector ~~who will make the required inspections.~~

~~and confirm NBIC compliance by signing and dating the applicable NBIC Form "R" Report Form upon completion of the work. In addition,~~

~~The Quality Systemmanual shall specifically address allowance for acceptance of the inspector for application of the "R" symbol stamp to a pressure retaining item and.~~

~~The manual shall provide for adequate control of the "R" Symbol Stamp.~~

pnpe) Inspections and InspectionsDocument Review

The ~~manual~~ Quality System shall make provisions for the Inspector to have access to the physical work and all all drawings, design calculations, specifications, procedures, process sheets, repair or alteration procedures, test results, and other documents as necessary to ensure compliance with the NBIC. A copy of the current ~~manual~~ Quality System shall be available to the ~~inspector~~ Inspector.

pqeq) Control of the "R" Symbol Stamp

The Quality System shall provide adequate control of the "R" Symbol Stamp. In addition, the Quality System shall make provisions for Inspector acceptance for the application of the "R" Symbol Stamp to the pressure retaining item or nameplate.

The accepted abbreviation of the "R" Certificate Holder's name shall be included in the manual.

~~prpq(r)~~ Report of Repair or Alteration Form

The ~~Quality System~~ manual shall indicate the title of the individuals responsible for preparing, ~~signing~~ certifying, and presenting the NBIC Report Forms to the Inspector. ~~The Inspector shall confirm NBIC compliance by certifying and dating the applicable NBIC Form "R" Report upon completion of the work. The distribution of the NBIC Form "R" Report shall be described in the Quality System.~~

~~The distribution of the NBIC Form "R" Report Forms shall be described in the manual.~~  
~~qs)qs)~~ Exhibits

~~Any forms~~Forms referenced in the ~~Quality System~~ manual shall be included ~~and~~. The form may be a part of the referencing document or included as an exhibit or appendix. For clarity, the forms may be completed and identified as examples. ~~When forms are identified as examples, a statement shall clearly define the acceptable modifications to the examples without requiring Inspector acceptance.~~ Different forms may be utilized without the need for acceptance by the Inspector as long as they contain the same information as the exhibited forms. ~~The name and accepted abbreviations of the "R" Certificate Holder shall be included in the manual.~~

~~rtre)~~ Construction Code

The ~~Quality System~~ manual shall include provisions for addressing the requirements that pertain to the specific construction code ~~code of construction~~ for the equipment being repaired or altered to include any applicable code cases or interpretations. ~~with acceptance of the jurisdiction.~~

~~sustt)~~ Nonconformances  
~~ing Items~~

~~A~~There shall be a system shall be established to identify and control a product or service ~~service~~ process a nonconformance occurs any characteristics do not conform in adherence which does not conform to the applicable rules of the NBIC, code of construction code, or jurisdictional requirements, or the Quality System to prevent their use. acceptable to the Inspector for the correction of nonconformities. A nonconformance is any condition that does not comply with the applicable rules of the NBIC, construction code, jurisdictional requirements, or the quality system. In addition, the ~~The~~ title(s) of the individual(s) who has responsibility and authority for the disposition and resolution ~~disposition of~~ of a nonconformance ~~nonconforming items~~ shall be defined including provisions for Inspector involvement. ~~Nonconformance must be corrected or eliminated before the repaired or altered component can be considered in compliance with the NBIC. Handling of programmatic concerns which do not affect product or service may be addressed in the Quality System. It is also essential that systemic or programmatic nonconformances be identified and corrected and when necessary, corrected within the Quality System.~~

~~tvttuu)~~ Records Retention

The quality manual shall describe a ~~a~~ system for filing, maintaining, and easily retrieving records supporting or substantiating ~~the administration of~~ the Quality System within the scope of the "R" Certificate of Authorization.

- 1) Records may represent any information ~~used to further substantiate the statements used to provide documented evidence to describe the scope of the quality of items and quality control activities of the~~ work completed to a pressure-retaining item (PRI), and documented on a Form "R" report as applicable.
- 2) Records may include, but are not limited to those depicting or calculating an acceptable design, material compliance or certifications, NDE-reports, PWHT-charts, a WPS used, a welder, bonder, or cementing technician's process continuity records, drawings, sketches, ~~or~~ photographs, etc.
- 3) The record retention schedule described in the Quality System ~~Manual is to~~ shall follow the instructions identified in NBIC Part 3, Table 1.5.1.

### PROPOSED REVISION OR ADDITION

<b>Item No.</b>
20-83
<b>Subject/Title</b>
Definition of Nonconformance
<b>NBIC Location</b>
Part: Repairs and Alterations & Repairs and Alterations; Section: 9 & 1.5; Paragraph: Glossary & 1.5.1 s)
<b>Project Manager and Task Group</b>
<b>Source (Name/Email)</b>
Terrence Hellman / thellman@nationalboard.org
<b>Statement of Need</b>
Action Item 19-60 is proposing revisions/additions to all of 1.5.1. This proposal is to move the definition of "Nonconformance" out of the current 1.5.1 s) paragraph and into the glossary.
<b>Background Information</b>
Current text in 1.5.1 s) that is being revised via Action Item 19-60: s) Nonconforming Items There shall be a system acceptable to the Inspector for the correction of nonconformities. A nonconformance is any condition that does not comply with the applicable rules of the NBIC, construction code, jurisdictional requirements, or the quality system. Nonconformance must be corrected or eliminated before the repaired or altered component can be considered in compliance with the NBIC.
<b>Existing Text</b>
<b>Proposed Text</b>
<u>Nonconformance – A condition of product or service in which any characteristics do not conform with the applicable rules of the NBIC, construction code, jurisdictional requirements, or the quality system.</u>

VOTE:							
COMMITTEE	Appr oved	Disapproved	Abs taine d	Not Voting	Passed	Faile d	Date

- e) For Transport Tanks, the Competent Authority, i.e. the U.S. Department of Transportation (DOT), shall be consulted for any requirements which it has established since they take precedence for repairs.
  - 1) Transport tanks manufactured prior to the adoption of ASME Section XII by the Competent Authority (DOT) were constructed in accordance with ASME Section VIII, Division 1. Certain transport tanks manufactured to this code were required to be stamped in accordance with Section VIII, Division 1, if the design pressure of the transport tank was 241 kPa (35 psi) (depending on material being transported) and greater. If the design pressure was less than 241 kPa (35 psi) (depending on material being transported), the transport tank was manufactured in accordance with Section VIII, Division 1, but not required by the Competent Authority (DOT) to be stamped.
  - 2) ASME stamped transport tanks are subject to the requirements of NBIC Part 3, for continued in-service repairs, alterations, or modifications, unless exempted by the Competent Authority (DOT).

### 1.3 INSPECTOR

- a) Inspection and certification shall be made by an Inspector holding a valid commission with the appropriate endorsement issued by the National Board and employed by an Authorized Inspection Agency (see NBIC Part 3, Section 9, Glossary of Terms for definition of Authorized Inspection Agency).
- b) An Inspector employed by an Owner-User Inspection Organization or a Federal Inspection Agency may authorize and accept work only on pressure-retaining items owned or used by the respective organization. Each accredited Owner-User Inspection Organization's quality program shall have specific approval of the Jurisdiction as required.

#### 1.3.1 AUTHORIZATION

- a) The Inspector's authorization to perform a repair or alteration shall be obtained by the repair organization prior to initiation of a repair or alteration to a pressure-retaining item. The Inspector shall determine that the repair or alteration methods are acceptable.
- b) Subject to acceptance of the Jurisdiction, the Inspector may give approval for routine repairs prior to the start of work, provided the Inspector ensures that the "R" Certificate Holder has adequately addressed routine repairs in the quality program.

#### ~~1.3.2~~ ACCEPTANCE INSPECTION 1.3.2 INSPECTIONS AND CERTIFICATIONS

- a) ~~The Inspector making the acceptance inspection~~ Inspections and NBIC Report Form certifications shall be performed by the same Inspector who authorized the repair or alteration activity. Where this is not possible or practicable, another Inspector may perform ~~these the duties acceptance inspection~~; however, in all cases, the Inspector ~~who performs the acceptance inspection~~ shall be employed by the same AIA an employee of the same organization as the Inspector who authorized the repair or alteration activity.
- b) ~~Before signing the appropriate NBIC Report Form, the Inspector shall: review the drawings, ensure the repair or alteration was performed in accordance with the accepted code of construction or standard, witness any pressure test or any acceptable alternative test method applied, ensure that the required nondestructive examinations have been performed satisfactorily, and that the other functions necessary to ensure compliance with the requirements of this code have been satisfactorily performed.~~
  - 1) Verify the repair or alteration activity was performed in accordance with the NBIC and accepted code of construction or standard.
  - 2) Verify any other functions necessary to ensure compliance with the requirements of the NBIC have been satisfactorily performed.
  - 3) Verify all applicable Inspector duties have been performed as required in NB-263 RCI-1.
  - 4) Verify the stamping or nameplate is correct and where applicable, the nameplate has been properly attached.
- b) ~~The Inspector shall verify the stamping or nameplate is correct and where applicable, the nameplate has been properly attached.~~

## 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.

### 5.2 DOCUMENTATION

(21)

- 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. 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. 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.
- d) Form R Reports shall be completed and certified by the Certificate Holder and the Repair Inspector no more than 90 days following the completion of the physical construction work, or following the completion of design work when no construction work is required.

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

- a) Using the instructions found 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 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.

(21)

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

- a) Using the instructions found 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

## 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 **no more than 30 days following certification**.
- 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.

Existing words

#### 4.2 NONDESTRUCTIVE EXAMINATION

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

- 1) For welds that were subject to volumetric NDE during construction, repairs may be examined by MT or PT in lieu of volumetric examination under all of the following conditions:
  - a) The repair depth does not exceed the lesser of 1/8 inch (3 mm) or 25% of the nominal base material thickness;
  - b) The aggregate repair length is no longer than the lesser of 6 inches (150 mm) or 10% of the total joint length; and
  - c) The base material and each layer of deposited weld shall be examined with MT or PT.

PROPOSED REVISION OR ADDITION

**Item No.** 21-33

**Subject/Title:** Use of code cases pertaining to repairs and alterations

**NBIC Location Part:** Repairs and Alterations; Section: 1; Paragraph: 1.2(~~fa~~)

**Project Manager and Task Group:** Robert Underwood, Subcommittee Repairs/Alterations

**Source (Name/Email):** Robert Underwood / [robert\\_underwood@hsb.com](mailto:robert_underwood@hsb.com)

**Statement of Need:** The NBIC Part 3 already references code cases in various paragraphs such as NR quality requirements, welding method 7, and R Form instructions, but there is no direct reference to acceptance of their use. I think it's always been an unwritten rule that they are permitted to be used with acceptance of the Inspector and Jurisdiction. This proposal will address this in a new paragraph 1.2(~~fa~~).

**Background Information:** Section IX approved Code Case 3002 which addresses qualification of WPS and WPQ relating to the Explosion Welding Process for Tube Plugging. This Code Case was specifically written for NBIC use. This proposal will clarify that use of code cases are permitted with Inspector and Jurisdiction approval, when required.

**Existing Text :**

**Proposed Text:**

1.2(~~fa~~) When the standard governing the original code of construction is the ASME Code or ASME RTP-1, repairs and alterations to pressure-retaining items shall conform, insofar as possible, to the section and edition of the ASME Code most applicable to the work planned. Use of active ASME Code Cases pertaining to the repair and alteration of pressure retaining items are subject to review and acceptance of the Inspector, and when required, the Jurisdiction. Use of the ASME Code Case shall be noted on the appropriate Form R Report.

### PROPOSED REVISION OR ADDITION

<b>Item No.</b> A 21-43	
<b>Subject/Title</b> Defining and revising "Practicable" and "Practical" within the NBIC	
<b>NBIC Location</b> Part: Repairs and Alterations; Section: 9; Paragraph: Glossary - All Parts	
<b>Project Manager and Task Group</b> Marty Toth, Subcommittee Repairs/Alterations	
<b>Source (Name/Email)</b> Marty Toth / mtoth@boiscotraininggroup.com	
<b>Statement of Need</b> Defining and revising Practicable and Practical within the NBIC and revising where applicable	
<b>Background Information</b> Defining and revising Practicable and Practical within the NBIC and revising where applicable	
<b>Existing Text</b>	<b>Proposed Text</b> TBD

VOTE:							
COMMITTEE	Approved	Disapproved	Abstained	Not Voting	Passed	Failed	Date

### PROPOSED REVISION OR ADDITION

<b>Item No.</b> A 21-44	
<b>Subject/Title</b> Defining "De-Rating" within Part 3	
<b>NBIC Location</b> Part: Repairs and Alterations; Section: Section 3; Paragraph: 3.4.1	
<b>Project Manager and Task Group</b> Marty Toth, Subcommittee Repairs/Alterations	
<b>Source (Name/Email)</b> Marty Toth / mtoth@boiscotraininggroup.com	
<b>Statement of Need</b> Defining de-rating within Part 3	
<b>Background Information</b> Defining de-rating within Part 3	
<b>Existing Text</b>	<b>Proposed Text</b> TBD

VOTE:							
COMMITTEE	Approved	Disapproved	Abstained	Not Voting	Passed	Failed	Date

**Item NB21-45, add “SUPPLEMENT XX - REPAIR METHODS OF PRESSURE VESSELS AND PIPING EXCLUSIVE TO OIL, GAS, AND CHEMICAL INDUSTRIES”**

**SXX.1 SCOPE**

This supplement provides methods for repair of pressure vessels and piping, outside the boiler setting, exclusive to oil, gas, and chemical industries.

**SXX.2 CONSTRUCTION STANDARDS**

Repairs shall conform, insofar as possible, to the relevant requirements of the edition of the code of construction. Where this is not practicable, it is permissible to use other codes, standards, or specifications, provided the “R” Certificate Holder has the concurrence of the Inspector and the jurisdiction, where required.

**SXX.3 LIMITATIONS**

Repairs will be limited to pressure retaining items which comply with the following conditions:

- a) Operates at or below 650°F (345°C) for carbon steels or below the time dependent service temperatures for low alloy steel.
- b) Impact testing was not required.
- c) No environmental or service-related cracking conditions exist. Service-related cracks may remain in the item when a Fitness for Service Assessment (FFSA) in accordance with NBIC, Part 2, 4.4.1, has been performed supporting the continued service of the item.

**SXX.4 JURISDICTIONAL REQUIREMENTS**

Repairs will require notification to the jurisdiction and where required, jurisdictional approval prior to performing work.

**SXX.5 REPAIR METHODS**

**a) WELDED LAP PATCH**

A fillet welded patch is a repair method used to maintain the structural integrity of the pressure retaining item by providing an external boundary over the area exhibiting damage in the form of a “fillet welded patch” as described by ASME PCC-2, Full Encirclement Steel Reinforcing Sleeves for Piping, Fillet Welded Lap Patches with Reinforcing Plug Welds, or Fillet Welded Lap Patches.

- 1) Welded lap patches shall be further restricted as follows:
  - a. A lap patches installed over an existing lap patch is prohibited.
  - b. The distance between patches shall not be less than  $2\sqrt{Rt}$ .
- 2) Except as required in Part 3, Paragraph SXX.5 a)4)a), ASME PCC-2 shall be used for the design of the fillet welded patch and shall be in accordance with the original code of construction, when practicable. Design of the fillet welded patch shall consider original design conditions, taking in to account current service conditions and damage mechanisms. Use of this method shall be acceptable to the inspector and when required, the jurisdiction and shall be limited to pressure containing equipment owned and operated by an Owner-User.
  - a. Replacement of a pressure-retaining part with a material of different nominal composition and, equal to or greater in allowable stress from that used in the original design, provided the replacement material satisfies the material and design requirements of the original code of construction under which the vessel was built. The minimum required thickness shall be at least equal to the thickness stated on the original Manufacturer's Data Report.
- 3) The “R” Certificate Holder responsible for the design of the fillet welded patch shall ensure a Fitness for Service Assessment (FFSA) has been performed on the

portion of the item being patched in accordance with NBIC, Part 2, 4.4.1, supporting the continued service of the item. The fillet welded patch repair method shall not remain in place beyond the calculated remaining life of the covered portion of the pressure retaining item.

- a) The remaining life of the pressure retaining item shall be documented on the Report of FFSA in the Remarks section. The Report of FFSA Form shall be affixed to the Form R-1 and identified in the Remarks section.
  - b) The thinned or leaking area shall be fully covered, as specified in the FFSA, to the distance where the minimum required metal thickness is verified. Wall thickness shall be verified in the area to be welded.
  - c) A fillet welded patch method shall not be used where cracks are present unless the cracks have been removed and repaired in accordance with Part 3, 3.3.4.2 a); the condition that led to the crack formation and propagation have been eliminated.
- 4) Hazards associated with welding on degraded components should be addressed with the Owner-User by the use of engineering controls, administrative controls and personal protective equipment.
- a) When the pressure retaining item will remain in service while implementing a fillet welded patch, the requirements and limitations described within ASME PCC-2, Part-1 shall be used in conjunction with ASME PCC-2, Part-2, Full Encirclement Steel Reinforcing Sleeves for Piping, Fillet Welded Lap Patches with Reinforcing Plug Welds, or Fillet Welded Lap Patches as applicable.
  - b) API RP-2201, "Safe Hot Tapping Practices in the Petroleum and Petrochemical Industries" may be used as a guideline for identifying hazards associated with welding to a component that is under pressure, including service restrictions.
- 5) Test or examination methods shall be in accordance with NBIC, Part 3, 4.4.1.
- a) Visual examination shall be in accordance with the NBIC, Part 3, 4.4.1 e).

#### SXX.6 Post Repair Inspection

- a) After the completion of weld repairs, post repair inspection requirements shall be established in accordance with Part 3, 3.3.4.8.

#### SXX.7 Documentation

- a) Completion of the Form R-1 shall follow the requirements for preparation, distribution, and registration as described in Part 3, Section 5.

#### **Additional actions required by accepting this item:**

#### **Revise the succeeding paragraph numbering order (ref.2021-edition) to:**

#### **3.3.3 EXAMPLES OF REPAIRS**

- v) The installation of a fillet welded patch.

## PROPOSED REVISION OR ADDITION

<b>Item No.</b> A 21-53	
<b>Subject/Title</b> Post Repair Inspection of weld repairs to CSEF steels	
<b>NBIC Location</b> Part: Repairs and Alterations; Section: S8.5; Paragraph: a)	
<b>Project Manager and Task Group</b>	
<b>Source (Name/Email)</b> Mark Kincs / mark.r.kincs@xcelenergy.com	
<b>Statement of Need</b> The requirement for Inspector involvement in post-repair inspections to CSEF weld repairs is to ensure future safe operation of the boiler. This is a function of the inservice Authorized Inspection Agency, not the Repair Inspector, whose duties end with completion of repair documentation.	
<b>Background Information</b> The post-repair inspection requirements specified in S8.5 are unique. There is no other mention of such inspections elsewhere in NBIC—Part 3. Presumably, Welding Method 6 repairs don't require post-repair inspection due to the perceived low-level of associated risk (inside the boiler setting).	
<b>Existing Text</b> After the completion of weld repairs to CSEF steels, post inspection requirements shall be developed and implemented based on acceptance from the Inspector, and if applicable, the Jurisdiction.	<b>Proposed Text</b> After the completion of weld repairs to CSEF steels, post inspection requirements shall be developed and implemented based on acceptance from the <u>inservice Authorized Inspection Agency of the pressure retaining item</u> <del>Inspector</del> , and if applicable, the Jurisdiction.

VOTE:							
COMMITTEE	Approved	Disapproved	Abstained	Not Voting	Passed	Failed	Date

### PROPOSED REVISION OR ADDITION


<b>Item No.</b> A 21-67	
<b>Subject/Title</b> Add welding requirements to plugging firetubes	
<b>NBIC Location</b> Part: Repairs and Alterations; Section: 3; Paragraph: 3.4.9	
<b>Project Manager and Task Group</b>	
<b>Source (Name/Email)</b> Kathy Moore / kathymoore@joemoorecompany.com	
<b>Statement of Need</b> The current NBIC does not have enough direction or requirements for welding tube plugs in firetubes	
<b>Background Information</b> Improper welding of tube plugs in firetubes often creates ligament cracks.	
<b>Existing Text</b>	<b>Proposed Text</b> Needs to be created

VOTE:							
COMMITTEE	Approved	Disapproved	Abstained	Not Voting	Passed	Failed	Date

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


FIGURE S9.2.1

FORM R-1, PAGE 1 OF 2

 <b>THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS</b>		NB-66, Rev. 16, (02/04/21)	
<b>FORM R-1 REPORT OF REPAIR</b> in accordance with provisions of the <i>National Board Inspection Code</i>			
1. WORK PERFORMED BY: <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">5</span> (name of repair organization)  (address)		<div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;"> <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">1</span>          (Authorized Rep. initials)       </div> <div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;"> <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">2</span>          (Inspectors initials)       </div> <div style="border: 1px solid black; padding: 2px; margin-bottom: 2px;"> <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">3</span>          (Form "R" Registration no.)       </div> <div style="border: 1px solid black; padding: 2px;"> <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">4</span>          (P.O. no., job no., etc.)       </div>	
2. OWNER: <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">6</span> (name)  (address)			
3. LOCATION OF INSTALLATION: <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">7</span> (name)  (address)			
4. ITEM IDENTIFICATION: <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">8</span> (boiler, pressure vessel, or piping)		NAME OF ORIGINAL MANUFACTURER: <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">9</span>	
5. IDENTIFYING NOS: <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">10</span> (mfg. serial no.)		<div style="display: flex; justify-content: space-between;"> <div><span style="border: 1px solid black; border-radius: 50%; padding: 2px;">11</span> (National Board no.)</div> <div><span style="border: 1px solid black; border-radius: 50%; padding: 2px;">12</span> (jurisdiction no.)</div> <div><span style="border: 1px solid black; border-radius: 50%; padding: 2px;">13</span> (other)</div> <div><span style="border: 1px solid black; border-radius: 50%; padding: 2px;">14</span> (year built)</div> </div>	
6. NBIC EDITION/ADDENDA: <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">15</span> (edition)		(addenda)	
Original Code of Construction for Item: <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">16</span> (name / section / division)		(edition / addenda)	
Construction Code Used for Repair Performed: <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">17</span> (name / section / division)		(edition / addenda)	
7. REPAIR TYPE: <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">18</span> <input type="checkbox"/> welded <input type="checkbox"/> graphite pressure equipment <input type="checkbox"/> FRP pressure equipment <input type="checkbox"/> DOT			
8. DESCRIPTION OF WORK: <input type="checkbox"/> Form R-4, Report Supplement Sheet is attached <input type="checkbox"/> FFSA Form (NB-403) is attached (use Form R-4, if necessary)			
<div style="border: 1px solid black; height: 40px; margin-top: 5px;"> <span style="border: 1px solid black; border-radius: 50%; padding: 2px; position: absolute; top: 5px; left: 5px;">19</span> </div>			
<div style="border: 1px solid black; height: 40px; margin-top: 5px;"> <span style="border: 1px solid black; border-radius: 50%; padding: 2px; position: absolute; top: 5px; left: 5px;">20</span> </div>			
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)			
<div style="border: 1px solid black; height: 40px; margin-top: 5px;"> <span style="border: 1px solid black; border-radius: 50%; padding: 2px; position: absolute; top: 5px; left: 5px;">23</span> </div>			
10. REMARKS: <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">24</span>			
<div style="border: 1px solid black; height: 40px; margin-top: 5px;"> <span style="border: 1px solid black; border-radius: 50%; padding: 2px; position: absolute; top: 5px; left: 5px;">21</span> </div>			
<div style="border: 1px solid black; height: 40px; margin-top: 5px;"> <span style="border: 1px solid black; border-radius: 50%; padding: 2px; position: absolute; top: 5px; left: 5px;">22</span> </div>			

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

 <b>THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS</b>	NB-66, Rev. 16, (02/04/21) <div style="border: 1px solid black; padding: 2px; text-align: center;">           (25)         </div> (Form "R" Registration no.) <div style="border: 1px solid black; padding: 2px; text-align: center;">           (26)         </div> (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) 37  
(National Board and Jurisdiction no. including endorsement)

Signed: (39) 38  
(Inspector)

Date: (40) 39

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Page 2 of 2

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.

TABLE S9.2 CONT'D

Reference to Circled Numbers in the Form	Description
(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" <i>Certificate of Authorization</i> number.
(29)	Indicate month, day, and year that the "R" <i>Certificate of Authorization</i> expires.


TABLE S9.2 CONT'D

Reference to Circled Numbers in the Form	Description
(30)	Record name of "R" Certificate Holder who performed the described work, using full name as shown on the <i>Certificate of Authorization</i> 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).
<del>(37)</del>	<del>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.</del>
<del>(38)</del> 37	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.
<del>(38)</del> 38	Signature of Inspector.
<del>(40)</del> 39	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

 <b>THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS</b>		NB-229, Rev. 8, (03/04/21)	
<b>FORM R-2 REPORT OF ALTERATION</b> in accordance with provisions of the <i>National Board Inspection Code</i>			
		(1)	(2)
		(Authorized Rep. initials)	(Inspectors initials)
		(3)	(4)
		(Form "R" Registration no.)	(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) _____ NAME OF ORIGINAL MANUFACTURER: (10) _____			
(boiler, pressure vessel, or piping)			
5. IDENTIFYING NOS: (11) _____ (12) _____ (13) _____ (14) _____ (15) _____			
(mfg. serial no.) (National Board no.) (jurisdiction no.) (other) (year built)			
6. NBIC EDITION/ADDENDA: (16) _____ (16) _____			
(edition) (addenda)			
Original Code of Construction for Item: (17) _____ (17) _____			
(name / section / division) (edition / addenda)			
Construction Code Used for Alteration Performed: (18) _____ (18) _____			
(name / section / division) (edition / addenda)			
7a. DESCRIPTION OF DESIGN SCOPE: <input type="checkbox"/> Form R-4, Report Supplement Sheet is attached			
(19) _____			
_____			
_____			
_____			
7b. DESCRIPTION OF CONSTRUCTION SCOPE: <input type="checkbox"/> Form R-4, Report Supplement Sheet is attached			
(20) _____			
_____			
_____			
_____			
(21) _____ Pressure Test, if applied (22) _____ psi MAWP (23) _____ psi			
This form may be obtained from The National Board of Boiler and Pressure Vessel Inspectors • 1055 Crupper Avenue, Columbus, Ohio 43229-1183 <span style="float: right;">Page 1 of 2</span>			

## FIGURE S9.3.2

## FORM R-2, PAGE 2 OF 2


	<b>THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS</b>	NB-229, Rev. 8, (03/04/21)
		(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)		
<b>DESIGN CERTIFICATION</b>		
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 <i>National Board Inspection Code</i> . National Board "R" Certificate of Authorization No. (29) expires on (30)		
Date (31), (32)	Signed (33)	
(name of design organization)	(authorized representative)	
<b>CERTIFICATE OF DESIGN CHANGE REVIEW</b>		
I, (34), holding a valid Commission issued by The National Board of Boiler and Pressure Vessel Inspector (36) and certificate of competency, where required, issued by the jurisdiction of (35) and employed by (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 <i>National Board Inspection Code</i> .		
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)
<b>CONSTRUCTION CERTIFICATION</b>		
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 <i>National Board Inspection Code</i> . National Board "R" Certificate of Authorization No. (42) expires on (43)		
Date (44), (45)	Signed (46)	
(name of alteration organization)	(authorized representative)	
<b>CERTIFICATE OF INSPECTION</b>		
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 <i>National Board Inspection Code</i> . 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) 51	Signed (53) 52	(54) 53
(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 2 of 2

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" <i>Certificate of Authorization</i> holder performing the design as it appears on the " <i>Certificate of Authorization</i> ".
(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.

TABLE S9.3 CONT'D

Reference to Circled Numbers in the Form	Description
(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" <i>Certificate of Authorization</i> authorized representative responsible for design certification.

TABLE S9.3 CONT'D

Reference to Circled Numbers in the Form	Description
(29)	Indicate National Board "R" <i>Certificate of Authorization</i> number.
(30)	Indicate month, day, and year that the "R" <i>Certificate of Authorization</i> expires.
(31)	Indicate month, day, and year the alteration was certified.
(32)	Record the name of National Board "R" <i>Certificate of Authorization</i> holder who performed the design portion of the work, using full name as shown on the " <i>Certificate of Authorization</i> " or an abbreviation acceptable to the National Board.
(33)	Signature of National Board "R" <i>Certificate of Authorization</i> 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" <i>Certificate of Authorization</i> authorized representative responsible for any construction.
(42)	Indicate the National Board "R" <i>Certificate of Authorization</i> number.
(43)	Indicate month, day, and year the National Board "R" <i>Certificate of Authorization</i> expires.
(44)	Indicate the date the alteration was certified.
(45)	Record the name of National Board "R" <i>Certificate of Authorization</i> holder who performed the construction portion of the described work, using full name as shown on the <i>Certificate of Authorization</i> or an abbreviation acceptable to the National Board.
(46)	Signature of National Board "R" <i>Certificate of Authorization</i> 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).

TABLE S9.3 CONT'D


Reference to Circled Numbers in the Form	Description
<del>(51)</del>	<del>Indicate the month, day and year of the final inspection by the Inspector.</del>
(52) 51	Indicate the month, day and year the completed Form R-2 was signed by the Inspector.
(53) 52	Signature of the Inspector certifying the construction inspection.
(54) 53	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.

## FORM R-3, PAGE 1 OF 2

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## FIGURE S9.4.2

## FORM R-3, PAGE 2 OF 2

	<b>THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS</b>	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) \_\_\_\_\_, \_\_\_\_\_ Signed (37) \_\_\_\_\_ (name of "R" Certificate holder)      Signed (38) \_\_\_\_\_ (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)~~ **43** \_\_\_\_\_ Signed ~~(45)~~ **44** \_\_\_\_\_ (inspector)      Commissions ~~(46)~~ **45** \_\_\_\_\_ (National Board and jurisdiction No. including endorsement)

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**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" <i>Certificate of Authorization</i> 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 " <i>Certificate of Authorization</i> ."
(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.

TABLE S9.4 CONT'D

Reference to Circled Numbers in the Form	Description
(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.

TABLE S9.4 CONT'D

Reference to Circled Numbers in the Form	Description
(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).
<del>(43)</del>	<del>Indicate month, day, and year of final inspection by Inspector.</del>
<del>(44)</del> 43	Indicate the month, day and year the completed Form "R" was signed by the Inspector.
<del>(45)</del> 44	Signature of Inspector.
<del>(46)</del> 45	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.



**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.





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

	<b>THE NATIONAL BOARD          OF BOILER AND PRESSURE VESSEL INSPECTORS</b>	NB-81, Rev. 8, (03/04/21)
		(NR Form Registration No.) (R/R Plan No., Job No., etc.)
<b>CERTIFICATE OF COMPLIANCE</b>		
I, <u>(26)</u> , employed by <u>(27)</u> 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 <u>(28)</u> and the <i>National Board Inspection Code "NR"</i> rules.		
National Board Certificate of Authorization No. <u>(29)</u> Expiration date: <u>(30)</u>		
Signed: <u>(31)</u> Date: <u>(32)</u>		
Title: <u>(33)</u> (authorized representative)		
<b>CERTIFICATE OF INSPECTION</b>		
I, <u>(34)</u> , 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 <u>(35)</u> and employed by <u>(36)</u> have inspected the repair/replacement and/or re-rating activities described in this report on <u>(37)</u> and state that to the best of my knowledge and belief, these activities have been completed in accordance with the Code specified and the <i>National Board Inspection Code "NR"</i> 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: <u>(38) 37</u> Date: <u>(39) 38</u> Commissions <u>(40) 39</u> (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
	<p>Title Block: Check type of activity, repair/replacement and/or rerating, as applicable.</p>
	<p>Check category of activity, 1, 2, or 3, as described in Part 3, Paragraph 1.6.2.</p>
(1)	<p>Name and address of the organization, as shown on the National Board "NR" Certificate of Authorization, which performed the activity.</p>
(2)	<p>Indicate NR Form Registration Number.</p>
(3)	<p>Indicate the repair/replacement plan, job number, etc., as applicable, assigned by the organization that performed the work for traceability to documentation.</p>
(4)	<p>Name and address of the owner of the nuclear facility.</p>
(5)	<p>Name and address of the nuclear power plant and, if applicable, identification of the unit.</p>
(6)	<p>Identify the system or component (e.g., residual heat removal, reactor coolant) with which the repair/replacement and/or re-rating activity is associated.</p>
(7)	<p>Identify the original design specification number and revision for the system or component listed in line 4.</p>
(8)	<p>Identify the original construction code, section, edition/addenda and applicable code cases used for the system or component identified in line 4.</p>
(9)	<p>NBIC Edition used for performing activities specified on this form.</p>
(10)	<p>Organization having responsibility for design when there is a change from the original design specification.</p>
(11)	<p>Identify code, section, edition/addenda and applicable code cases used for design, when applicable.</p>
(12)	<p>Check the type of test conducted (e.g., hydrostatic, pneumatic, system leakage, exempt, or other) and indicate the pressure applied when applicable.</p>
(13)	<p>Indicate the number of components where work was performed. Each component shall be indicated on page 2 of the form NR-1.</p>
(14)	<p>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.</p>
(15)	<p>Indicate any additional information pertaining to the work, including manufacturer's data reports.</p>

TABLE S9.6 CONT'D

Reference to Circled Numbers in the Form	Description
(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.
<del>(37)</del>	<del>Indicate month, day, and year of inspection by the Authorized Nuclear Inspector.</del>


TABLE S9.6 CONT'D

Reference to Circled Numbers in the Form	Description
<del>(38)</del> 37	Signature of Authorized Nuclear Inspector.
<del>(39)</del> 38	Indicate month, day, and year of signature by the Authorized Nuclear Inspector.
<del>(40)</del> 39	National Board Commission number and required endorsements.





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

	<b>THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS</b>	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) (authorized representative) (41) (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) 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) 46 (inspector) Date (48) 47 (49) 48 (National Board and endorsement)

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**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.

TABLE S9.7 CONT'D

Reference to Circled Numbers in the Form	Description
(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.

TABLE S9.7 CONT'D

Reference to Circled Numbers in the Form	Description
(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).
<del>(46)</del>	<del>Indicate month, day, and year of inspection by the Authorized Nuclear Inspector.</del>
<del>(47)</del> 46	Signature of Authorized Nuclear Inspector defined in item 42 above.
<del>(48)</del> 47	Indicate month, day, and year of signature by the Authorized Nuclear Inspector.
<del>(49)</del> 48	National Board Commission number and required endorsements.

## 2.3 STANDARD WELDING PROCEDURE SPECIFICATIONS (SWPSs)

a) One or more SWPSs from NBIC Part 3, Table 2.3 may be used as an alternative to one or more WPS documents qualified by the organization making the repair or alteration, provided the organization accepts by certification (contained therein) full responsibility for the application of the SWPS in conformance with the Application as stated in the SWPS. When using SWPSs, all variables listed on the Standard Welding Procedure are considered essential and, therefore, the repair organization cannot deviate, modify, amend, or revise any SWPS. US Customary Units or metric units may be used for all SWPSs in NBIC Part 3, Table 2.3, but one system shall be used for application of the entire SWPS in accordance with the metric **conversions** contained in the SWPS. The user may issue supplementary instructions as allowed by the SWPS. Standard Welding Procedures Specifications shall not be used in the same product joint together with the other Standard Welding Procedure Specifications or other welding procedure specifications qualified by the organization. SWPSs may be purchased at the AWS Bookstore at <http://pubs.aws.org>.

b) The AWS reaffirms, amends or revises SWPSs in accordance with ANSI procedures.

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

**TABLE 2.3**

### SWPS DESIGNATION: YEAR

B2.1-1-001: 2020	B2.1-1-201: 2019	B2.1-8-215: 2012	B2.1-1/8-229: 2013
B2.1-1-002: 2020	B2.1-1-202: 2019	B2.1-8-216: 2012	B2.1-1/8-230: 2013
B2.1-1-016: 2018	B2.1-1-203: 2019	B2.1-4-217: 2021	B2.1-1/8-231: 2015
B2.1-1-017: 2018	B2.1-1-204: 2019	B2.1-4-218: 2021	B2.1-1-232: 2020
B2.1-1-018: 2021	B2.1-1-205: 2019	B2.1-4-219: 2021	B2.1-1-233: 2020
B2.1-1-019: 2018	B2.1-1-206: 2019	B2.1-4-220: 2021	B2.1-1-234: 2021
B2.1-1-020: 2018	B2.1-1-207: 2019	B2.1-4-221: 2021	B2.1-1-235: 2021
B2.1-1-021: 2018	B2.1-1-208: 2019	B2.1-5A-222: 2021	
B2.1-1-022: 2018	B2.1-1-209: 2019	B2.1-5A-223: 2021	
B2.1-8-023: 2018	B2.1-1-210: 2012	B2.1-5A-224: 2021	
B2.1-8-024: 2012	B2.1-1-211: 2012	B2.1-5A-225: 2021	
B2.1-8-025: 2012	B2.1-8-212: 2012	B2.1-5A-226: 2021	
B2.1-1-026: 2018	B2.1-8-213: 2012	B2.1-1/8-227: 2013	
B2.1-1-027: 2018	B2.1-8-214: 2012	B2.1-1/8-228: 2013	

### STATUS:

**2022** 14 SWPSs: All have been updated and are presently being balloted in committee  
**2021** 13 SWPSs: Approved and at the Printers targeting a December 2021 release  
**2020** 4 SWPSs Done  
**2019** 9 SWPSs Done  
**2018** 9 SWPSs Done

**TOTAL: 49 SWPSs**

Terry,

This table represents where we are and where we are going with Table 2.3. I will prepare a ballot in the Fall to correct a typo and delete the word table and submit (hopefully) 13 SWPSs for NBIC adoption.

Jim Sekely

## PROPOSED REVISION OR ADDITION

<b>Item No.</b> A 21-71	
<b>Subject/Title</b> Remove the mechanical portion of tube plugging from 3.3.4.9. Only address i	
<b>NBIC Location</b> Part: Repairs and Alterations; Section: 3; Paragraph: 3.4.9	
<b>Project Manager and Task Group</b>	
<b>Source (Name/Email)</b> Kathy Moore / kathymoore@joemoorecompany.com	
<b>Statement of Need</b> Removing the mechanical portion of the text. Many Jurisdictions are having a difficult time enforcing that part of the NBIC	
<b>Background Information</b> Mr, Kinney wrote on the Chief's Forum and asked the Chiefs what they thought of 3.3.4.9. They wanted the mechanical portion dropped.	
<b>Existing Text</b>  3.3.4.9 TUBE PLUGGING IN FIRETUBE BOILERS When the replacement of a tube in a firetube boiler is not practicable at the time the defective tube is detected, with the concurrence of the owner, Inspector, and when required, the Jurisdiction, the tube may be plugged using the following course of repair: a) The scope of work, type of plug and method of retention; whether welded or mechanical interface, shall be evaluated by the "R" Certificate Holder performing the repair and reviewed with the Inspector, and when required, the Jurisdiction. b) When the method of plugging is by welding, strength calculations for the size of the weld shall be in accordance with the original code of construction. The "R" Certificate Holder performing this repair shall weld the plug to the tube, or to the tube sheet, or a combination of both. c) Plugging a tube in a firetube boiler is recognized as an alternative to the replacement of a firetube and may be further limited as a method of repair by the number of tubes plugged and their location; scattered or clustered. The operational effects on the waterside pressure boundary or membrane and the effects on the combustion process throughout the boiler should be considered prior to plugging. d) The boiler may be returned to service for a period of time agreed upon by the owner, the Inspector, and when required, the Jurisdiction. e) The Form R-1 shall be completed for the plugging of firetubes, identifying the means of plug retention; mechanical or by welding.	<b>Proposed Text</b>  Where it is not practicable to mechanically plug a tube in a firetube boiler, the plug may be secured to the tube and/or tubesheet by welding with the concurrence of the owner, the Inspector, and the Jurisdiction where the pressure-retaining item is installed, where required. The following course of repair shall be followed: a) The scope of work, type of plug and method of retention, shall be evaluated by the "R" Certificate Holder performing. b) Strength calculations for the size of the weld shall be performed in accordance with the original code of construction. c) The operational effects on the waterside pressure boundary or membrane and the effects on the combustion process throughout the boiler should be considered prior to plugging as this may limit the quantity of tubes plugged. d) The boiler may be returned to service for a period of time agreed upon by the owner, the Inspector, and the Jurisdiction where the pressure-retaining item is installed, where required. e) The Form R-1 shall be completed for the welded plugging of firetubes.

VOTE:							
COMMITTEE	Approved	Disapproved	Abstained	Not Voting	Passed	Failed	Date

## PROPOSED REVISION OR ADDITION

<b>Item No.</b> A 21-77	
<b>Subject/Title</b> Repairs/Alterations of Impact Tested Vessels	
<b>NBIC Location</b> Part: Repairs and Alterations; Section: 3; Paragraph: 3.3.6	
<b>Project Manager and Task Group</b>	
<b>Source (Name/Email)</b> Robert Underwood / robert_underwood@hsb.com	
<b>Statement of Need</b> There is an urgent need to address these concerns as the repair firms cannot comply with the existing wording in 3.3.6. The plan is to incorporate this item into the 2023 Edition of Part 3 and propose a corresponding Intent Interpretation that would provided guidance to NBIC users as soon as possible.	
<b>Background Information</b> Existing paragraph 3.3.6 contains some requirements that the repair firm cannot comply with such as determining the heat treated condition and the notch toughness characteristics of the material to be repaired. It also contains references to dead links in the NBIC that provide no guidance to the repair firm. This proposal would eliminate the requirements of knowing the heat treated condition and the notch toughness characteristics of the material to be repaired and simply refer back to the original construction code in regards to WPS qualification. The proposal also would move the location of these requirements from paragraph 3.3.6 (which addresses repair only) to 3.2.8 which addresses repairs and alterations.	
<b>Existing Text</b> 3.3.6 PRESSURE VESSEL IMPACT TESTING a) Welding procedures used for repairs shall be qualified with impact testing when required by the original code of construction. The requirements for impact testing shall be in accordance with the rules of the original code of construction except that vessel (production) impact testing is not required. b) The test material for the welding procedure qualification with impact testing shall be of the same P-number and Group number, and heat-treated condition as the material being repaired. 1) 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). 2) In the event that the original material specification is obsolete, the material used for the test coupon 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), and heat-treated condition, but in no case shall the material be lower in strength.	<b>Proposed Text</b> 3.2.8 PRESSURE VESSEL IMPACT TESTING a) Welding procedures used for repairs shall be qualified with impact testing when required by the original code of construction. The requirements for impact testing shall be in accordance with the rules of the original code of construction except that vessel (production) impact testing is not required. b) The test material for the welding procedure qualification with impact testing shall be of the same P-number and Group number as the material being repaired.

VOTE:							
COMMITTEE	Approved	Disapproved	Abstained	Not Voting	Passed	Failed	Date

## PROPOSED REVISION OR ADDITION

<b>Item No.</b> A 21-82	
<b>Subject/Title</b> Examples of Repairs	
<b>NBIC Location</b> Part: Repairs and Alterations; Section: 3; Paragraph: 3.3.3(s)	
<b>Project Manager and Task Group</b> Robert Underwood, Subcommittee Repairs/Alterations	
<b>Source (Name/Email)</b> Robert Underwood / robert_underwood@hsb.com	
<b>Statement of Need</b> Adding "repair" to 3.3.3(s) would then address use of different weld material. Currently 3.3.3(s) only addresses replacement of the part, not repair (Repair is addressed in 3.3.3(r)).	
<b>Background Information</b> We have had some recent questions from repair firms about using different weld metal when performing repairs of pressure retaining items. The NBIC does not directly address use of weld metal that is different than the original design. Paragraph 3.3.3(r) addresses "repair" or replacement of pressure parts which I think covers the weld metal, but 3.3.3(s) only addresses "replacement" of the pressure part. This proposal would simply add "repair" to 3.3.3(s) which would address use of weld metal of a different composition.	
<b>Existing Text</b> Replacement of a pressure-retaining part with a material of different nominal composition and, equal to or greater in allowable stress from that used in the original design, provided the replacement material satisfies the material and design requirements of the original code of construction under which the vessel was built. The minimum required thickness shall be at least equal to the thickness stated on the original Manufacturer's Data Report;	<b>Proposed Text</b> The repair or replacement of a pressure-retaining part with a material of different nominal composition and, equal to or greater in allowable stress from that used in the original design, provided the replacement material satisfies the material and design requirements of the original code of construction under which the vessel was built. The minimum required thickness shall be at least equal to the thickness stated on the original Manufacturer's Data Report;

VOTE:							
COMMITTEE	Approved	Disapproved	Abstained	Not Voting	Passed	Failed	Date