



THE  
NATIONAL  
BOARD

# NATIONAL BOARD Task GROUP LOCOMOTIVE BOILERS

## Minutes

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Meeting of July 15<sup>th</sup>, 2019  
Kansas City, MO

These minutes are subject to approval and are for the committee use only. They are not to be duplicated or quoted for other than committee use.

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

**1. .Call to Order**

9:00AM local time.

**2. Introduction of Members and Visitors**

L. Moedinger Chair	M. Jordan-call in	
R. Ferrell Secretary	R. Musser	
S. Lee	G. Mark Ray	
D. Griner-call in	J. Churchill- visitor	
P. Welch	D. Martinez-visitor	

**3. Announcements**

The National Board will be hosting a reception for all committee members and visitors on Wednesday evening at 5:30pm in the Rooftop Ballroom on the top floor of the InterContinental.  
SG L name is changed to Locomotive Task Group  
Power Point Presentation on Balloting

**4. Adoption of the Agenda**

**5. Approval of the Minutes of July 2019 Meeting**

The minutes are available for review on NBICSHARE.org website

**6. Review of Rosters (Attachment Page 1)**

a. **Membership Appointments**

b. **Membership Reappointments**

G. Mark Ray last reappointment in March 2016

c. **Officer Elections** New Chair- G. Mark Ray and new Vice Chair Rick Musser by email vote, unanimous

**7. NBIC Business**

a. **Interpretations**

<b>Item Number: 17-143</b>	<b>NBIC Location: Part 3 3.2.2</b>	<b>Attachment Page 5</b>
<p><b>General Description:</b> An R certificate holder wants to manufacture a sub assembly and use it on a power boiler.</p> <p><b>Subgroup:</b> Locomotive</p> <p><b>Task Group:</b> P Welch PM</p> <p><b>July 2017:</b> Item discussed. Mr. Welch will supply wording for the reply which will be letter balloted to this sub-group following the July 2017 meeting.</p> <p><b>April 2018:</b> Progress Report</p> <p>July 2019 Moved unanimously</p>		

<b>Item Number: 19-17</b>	<b>NBIC Location: Part 3, S1.2.11.3</b>	<b>Attachment Page 6</b>
<p><b>General Description:</b> Wastage at Mudring: If the majority of the wastage is on the fireside, and there minimal wastage on the waterside, does this section still govern repairs?</p> <p><b>Subgroup:</b> Locomotive</p> <p><b>Task Group:</b> None</p> <p><b>Background:</b> This question is in regards to a CFR 230, 1472 day boiler inspection on a 1927 built Baldwin 4-8-4 steam locomotive. The door sheet (aka back sheet) in the firebox has sustained wastage at the mudring on the fireside, caused by the proximity of the firebrick. In the figure S1.2.11.3, the drawing indicates a wastage on the waterside, yet the text of section S1.2.11.3 does not specify if it is referring to the waterside, the fireside, or both. Please see attached diagram of the wastage in question.  <b>July 2019 :</b> moved unanimously</p>		

**b. Action Items – Old Business**

<b>Item Number: 18-6</b>	<b>NBIC Location: Part 2, S1.4.2.9</b>	<b>No Attachment</b>
<p><b>General Description:</b> was NB14-1802, Riveted Stay bolt dimensions</p> <p><b>Subgroup:</b> Locomotive</p> <p><b>Task Group:</b> (PM) M Janssen</p> <p><b>July 2019:</b> Progress Report</p>		

**c. Action Items – New Business**

<b>Item Number: 18-84</b>	<b>NBIC Location: Part 3, S1.2.8</b>	<b>Attachment Page 7</b>
<p><b>General Description:</b> Additional subparagraph in Part 3, S1.2.8 about the use of patch bolts being in accordance with ASME BPVC</p> <p><b>Subgroup:</b> Locomotive</p> <p><b>Task Group:</b> (PM) R. Musser</p> <p><b>July 2019 :</b> Moved unanimously</p>		

<b>Item Number: 18-95</b>	<b>NBIC Location: Part 3, S1.1.4</b>	<b>Attachment Page 8</b>
<b>General Description:</b> Revision to Part 3, S1.1.4 to account for new rules for riveted construction		
<b>Subgroup:</b> Locomotive		
<b>Task group:</b> (PM) L. Moedinger		
<b>July 2019 :</b> moved unanimously		

<b>Item Number: 19-38</b>	<b>NBIC Location: Part 3, S1.1.3.1 d)</b>	<b>Attachment Page 9</b>
<b>General Description:</b> Part 3, S1.1.3.1, Staybolt deflection and stress		
<b>Subgroup:</b> Locomotive		
<b>Task group:</b> None		
Corrected in the current 2019 code, closed unanimously		

#### 8. Future NBIC Meetings

- January 13<sup>th</sup>-16<sup>th</sup>, 2020 – San Diego, CA
- July 2020 – Louisville, KY

#### 9. Adjournment 11:42

Respectfully submitted,

Robert Ferrell  
SG Locomotives Secretary

**Item 17-143 6-13-17**

Allan Bornhorst  
QC SUPERVISOR  
[allan@geotechindustries.com](mailto:allan@geotechindustries.com)  
(250) 246 - 4312

GEO-TECH INDUSTRIES INC is a "R" stamp holder (R-5577) and also a "U" stamp holder (27,481) which we have maintained for the past 20 years. We are looking to repair a 1920 Shay locomotive using the "R" stamp designation. The current boiler on the Shay locomotive is of riveted construction and we are wanting to perform the repair with welded construction. We have planned on reusing 2 pressure retaining backing plate in the boiler shell which supported the 1" pipe nipples that were threaded externally through the shell and backing plate plus riveted. Since originally these plate were riveted onto the interior of boiler shell, we would now attached the 2 backing plate parts as a welded connection. We were needing a code interpretation for the following.

**Question: According to NBIC Part 3-Section 3: 3.2.2 Replacement Parts**

Can the "R" stamp repair shop performing the necessary repairs of a boiler use a sub assembly part, which is of the pressure boundary, that is welded in house; i.e. (shell of boiler)?

The question arises because I was informed by the Safety Authority that according to BPV Code Section 1, any welded part used for repair of a boiler shall be manufactured by a "S" stamp certified shop.

The Sub Groups response: Can an "R" stamp certificate holder manufacture and use parts or sub-assemblies for use as part of the pressure boundary in the repair of a power boiler? YES

To: Allan Bornhorst, QC Supervisor

Geotech Industries

From: NBIC Committee

The committee feels that providing any more information on your method of repair would be providing consulting services which is against NBIC committee protocol.

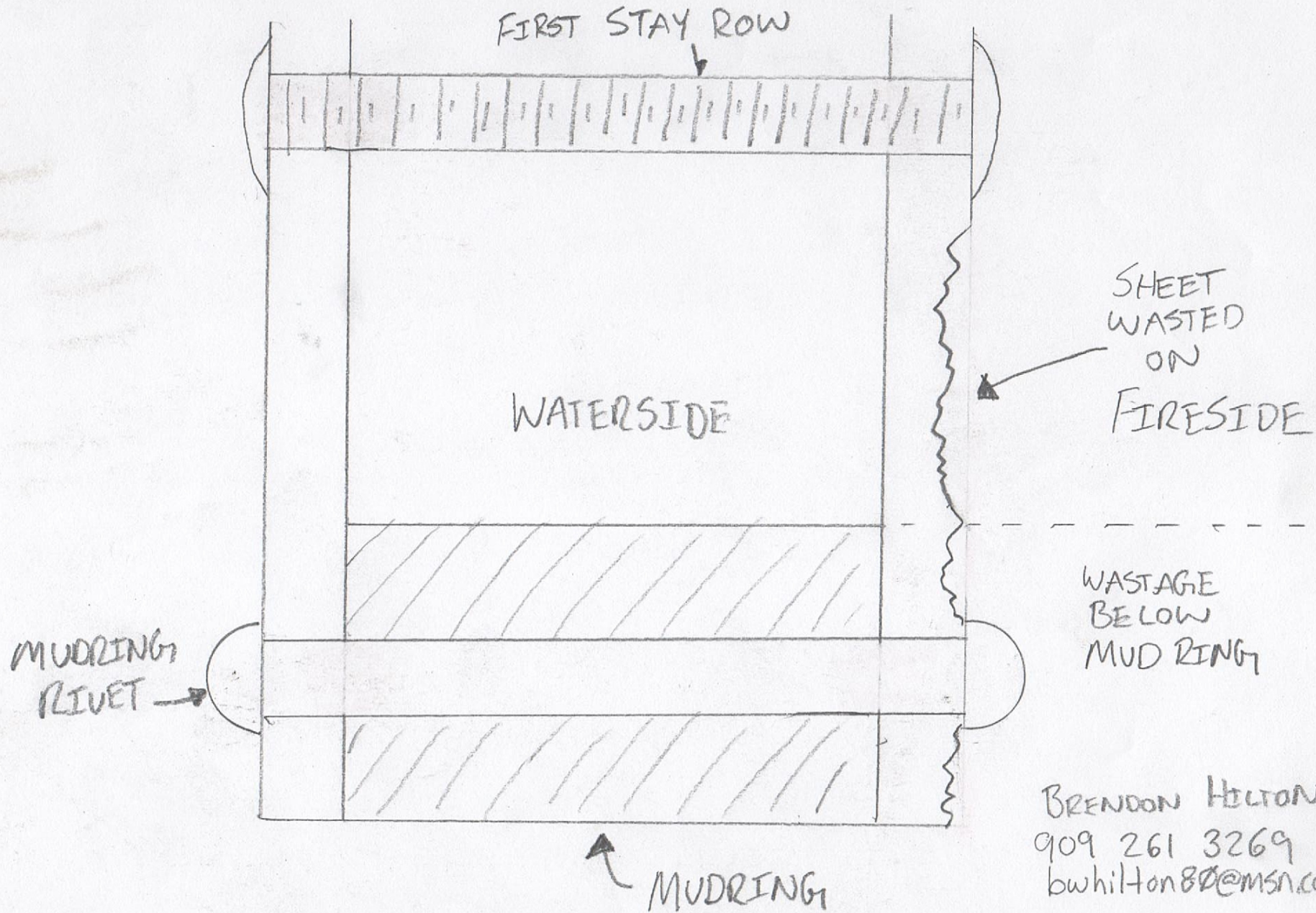
Item 19-17: Interpretation of Part 3, S1.2.11.3  
Submitted by: Brendon Hilton [bwhilton80@msn.com](mailto:bwhilton80@msn.com)

Background - This question is in regards to a CFR 230, 1472 day boiler inspection on a 1927 built Baldwin 4-8-4 steam locomotive. The door sheet (aka back sheet) in the firebox has sustained wastage at the mudring on the fireside, caused by the proximity of the firebrick. In the figure S1.2.11.3, the drawing indicates a wastage on the waterside, yet the text of section S1.2.11.3 does not specify if it is referring to the waterside, the fireside, or both. Please see attached diagram of the wastage in question.

Question - If the majority of the wastage is on the fireside, and there is minimal wastage on the waterside, does NBIC Part 3, 3.3.4.3-a govern repairs?

Answer - Yes

QUESTION: IF THE MAJORITY OF WASTAGE IS ON THE FIRESIDE, DOES  
RULE 5.1.2.11.3 STILL GOVERN REPAIR?



BRENDON HILTON  
909 261 3269  
bwhilton88@msn.com

## Patch Bolts

Proposed addition (*in italics*) to NBIC S1.2.8;

### S1.2.8 Patch bolts

- a) The use of patch bolts is permissible in accordance with the ASME BPVC, Section I, Part PL.
- b) Patch bolts may be replaced in kind.
- c) Seal welding of bolts is permitted.
- d) Patch bolts shall either have 11 or 12 pitch thread pitch. Patch bolt threads shall be fit to support the structure to which the bolt is applied. Changing the patch bolt thread from 11 to 12, or the reverse, shall be considered a repair.
- e) A patch bolt applied in place of a rivet shall be considered an alteration.



Item 18-95

Existing wording:

a) Most steam locomotive boilers were manufactured in the first half of the 20<sup>th</sup> century or before. The calculations, formula, and shop practices used are now distant history and quite difficult to obtain. The rules for riveted construction were last published by ASME in Section I Code, 1971 Edition.

Proposed wording:

a) Most steam locomotive boilers were manufactured in the first half of the 20<sup>th</sup> century or before. The calculations, formula, and shop practices used are now distant history and quite difficult to obtain. The rules for riveted construction were last published by ASME in Section I Code, 1971 Edition until the publication of ASME, Section I, Part PR and Part PL, which now govern new riveted construction and steam locomotive boiler construction.

May 29, 2019

To: Secretary NBIC Committee  
The National Board of Boiler and Pressure Vessel Inspectors  
Email: NBICinquiry@nationalboard.org

Cc: Mr. William Vallance, Senior Staff Engineer  
Email: BVallance@nationalboard.org

Subject: Revision Request – NBIC Part 3, S1.1.3.1 (d)

Dear Sir:

I hereby request the Committee to consider a revision to the subject paragraph of the code, which reads as follows:

S1.1.3.1 MATERIAL LIST FOR STEAM LOCOMOTIVE BOILERS ...

d) When staybolt material tensile strength is greater than that of the firebox sheets, the firebox sheets deflect instead of the staybolts, which can result in the sheets developing cracks and leaking staybolts. In addition, high tensile strength steels are difficult to drive. Maximum allowable tensile strength shall be 7,500 psi (51.71 MPa).

Referring to the first sentence, the firebox sheet cannot deflect unless the driven staybolt deflects as well, regardless of their relative strengths. The process of driving a staybolt embodies deflection inherently. The second sentence is incorrectly worded, since no steel used in boilers has a tensile strength as low as 7,500 psi. I believe the intent here was to specify the maximum allowable *stress* on staybolts, not their strength. I refer the Committee to 49 CFR 230 which states, in part:

§ 230.25 Maximum allowable stress on stays and braces.

The maximum allowable stress per square inch of net cross sectional area on fire box and combustion chamber stays shall be 7,500 psi.

Substituting the word “stress” for “strength” rectifies the problem. Even if corrected, I suggest that this sentence doesn't really belong in this subsection, since it pertains to design and not to the selection of materials.

I propose replacing Paragraph (d) in its entirety with the wording below: to address the relative strengths of the firebox sheets and staybolts; to better explain the principle of driving a staybolt; and, to remove the irrelevant sentence.

d) A staybolt should have a lower tensile strength than the sheets into which it is driven. During driving, this will cause the staybolt to undergo plastic deformation before the sheet does, ensuring that the head and the threads of the staybolt conform to, and make a tight seal with, the mating surfaces of the sheet. The use of relatively harder staybolts can result in the sheets developing cracks and the staybolts leaking. In addition, staybolts of high-tensile steels are difficult to drive.

Sincerely,

John E. Howard, P. E.  
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Ventura, CA 93001 U.S.A.  
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805-701-0289

This item was closed by TGLB at the 15 July 2019 meeting because the 2019 Edition of Part 3 had the correct reference to stress rather than strength. It was felt the wording otherwise was sufficiently clear to not require a change. LW Moedinger 7/15/2019