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THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

NATIONAL BOARD INSPECTION CODE COMMITTEE

MINUTES

Meeting of July 16, 2015
Columbus, OH

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The National Board of Boiler & Pressure Vessel Inspectors
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1. Call to Order

The meeting was called to order by NBIC Committee Chair Mr. Don Cook at 8:02 am on July 16, 2015.

2. Introduction of Members and Visitors

Mr. Cook asked the members of the NBIC Committee to introduce themselves, as well as visitors attending the meeting. After introductions, a sign in sheet was passed to all committee members and visitors. The sign in sheet is attached (Attachment Pages 1-3)

3. Announcements

Mr. Cook made several announcements. He reminded committee members and visitors to use the provided microphones to address the committee. Mr. Cook also thanked the National Board and National Board Executive Director Mr. Dave Douin for their contribution to the publication of the NBIC. Mr. Douin thanked Mr. Cook and the NBIC Committee for their contribution to the NBIC. Mr. Douin also presented three service awards; Mr. Paul Edwards was presented a 20 year service pin, Mr. Robert Wielgoszinski was presented a 20 year service pin, and Mr. Ron Pulliam was presented a 5 year service pin. Mr. Cook then updated the committee on letter ballot participation concerns, and reminded the committee members to respond to letter ballots. As a final announcement, Mr. Cook announced the schedule for the next two NBIC meetings. These meetings will be held January 11-14 in Corpus Christi, TX and July 18-21 in Columbus, OH.

4. Adoption of the Agenda

Mr. Cook asked for additions to the agenda before final approval of the agenda. The following items were added to the agenda by their respective subcommittee chairs.

- SC Installation – IN15-0501, NB15-0106, NB15-0107, NB15-0108, NB15-2303
- SC Inspection – NB15-2304
- SC Repairs and Alterations – IN15-0401, NB15-2502, NB15-2503, NB15-2801, NB15-2802, NB15-1902, NB15-1903, NB15-2305
- SC PRD – NB15-0322, NB15-0323, NB15-0324

Several corrections were noted by committee members. The following items were corrected in the agenda:

- Kevin Simmons interest category was incorrect on the committee roster, and was changed to "Manufacturer."
- In the description for NB14-1101, the word "diagram" was changed to "diaphragm"
- The NBIC Location Section for NB15-0504 was changed from "CO2 Supplement" to "Part 2, S10"

After these additions and corrections were noted, the agenda was adopted as modified by a unanimous vote of the NBIC Committee.

5. Approval of the Minutes of January 22, 2015 Meeting

The minutes of the January 22, 2015 meeting were adopted as posted on the National Board website by a unanimous vote of the NBIC Committee.

6. Review of Rosters

Mr. Cook informed the NBIC Committee of the following membership items:

a. Membership Nominations

- Mr. Joel Amato was nominated for membership to the NBIC Committee. His nomination was approved by a unanimous vote of the NBIC Committee, subject to acceptance by the National Board Board of Trustees Chairman Mr. John Burpee.

- Mr. David Ford was nominated for membership to SC Inspection. Mr. Staniszewski reported on Mr. Ford's career background. His nomination was approved by a unanimous vote of the NBIC Committee, subject to acceptance by the National Board Board of Trustees Chairman Mr. John Burpee. (Attachment Pages 4-5)

b. Membership Reappointments

- Mr. Don Cook, Mr. Paul Edwards, Mr. Mark Mooney, and Mr. Stanley Staniszewski were nominated eligible for reappointment to the NBIC Committee. Their nominations were approved by a unanimous vote of the NBIC Committee, subject to acceptance by the National Board Board of Trustees Chairman Mr. John Burpee.

- Mr. H. Michael Richards, Mr. Paul Bourgeois, Mr. Geoffrey Halley, and Mr. Brian Moore were nominated for reappointment to the Subcommittee on Installation. Their nominations were approved by a unanimous vote of the NBIC Committee, subject to acceptance by the National Board Board of Trustees Chairman Mr. John Burpee.

- Mr. Mark Mooney, Mr. Stanley Staniszewski, Mr. Dominic Canonico, Mr. Jim Getter, Mr. Mark Horbaczewski, Mr. Greg McRae, Mr. Jim Riley, and Mr. Mike Schwartzwalder were nominated for reappointment to the Subcommittee on Inspection. Their nominations were approved by a unanimous vote of the NBIC Committee, subject to acceptance by the National Board Board of Trustees Chairman Mr. John Burpee.

- Mr. George Galanes, Mr. Brian Boseo, Mr. Paul Edwards, Mr. James Larson, Mr. Brian Schulte, Mr. James Sekely, and Mr. Michael Webb were nominated for reappointment to the Subcommittee on Repairs and Alterations. Their nominations were approved by a unanimous vote of the NBIC Committee, subject to acceptance by the National Board Board of Trustees Chairman Mr. John Burpee.

- Mr. Sid Cammeresi, Ms. Marianne Brodeur, Mr. Denis DeMichael, and Mr. Robert Donalson were nominated for reappointment to the Subcommittee on Pressure Relief Devices. Their nominations were approved by a unanimous vote of the NBIC Committee, subject to acceptance by the National Board Board of Trustees Chairman Mr. John Burpee.

c. Officer Selection

- Mr. Don Cook's appointment as NBIC Committee Chair was set to expire July 31, 2015. As this matter was in regards to his position as NBIC Committee Chair, Mr. Cook turned control of the meeting over to NBIC Committee Vice Chair Mr. Robert Wielgoszinski. Nominations were solicited for the NBIC Committee Chair position. Mr. Cook was the only nomination. Mr. Cook's nomination to NBIC Committee Chair position was approved by a unanimous vote of the NBIC Committee, subject to acceptance by the National Board Board of Trustees Chairman Mr. John Burpee. After voting concluded, Mr. Wielgoszinski returned control of the meeting to Mr. Cook.

7. Report of Subcommittees

a. Subcommittee on Installation

Mr. Cook invited Subcommittee on Installation Chair Mr. Michael Richards to report on the activities of SC Installation. Mr. Richards presented on the following:

i. Interpretations

Item Number: IN15-0501	**NBIC Location: Part 1**	**Attachment Pages 6-7**
General Description: In the case of a hot-water supply boiler and storage tank, is it permissible to place the operating limit on the storage tank? **Subgroup:** Installation **Task Group:** M. Wadkinson (PM), B. Moore, S. Konopacki, E. Wiggins, D. Patten **Meeting Action:** Mr. Richards invited Mr. Paul Bourgeois to present on the proposed interpretation response. The proposed interpretation response was approved by SC Installation with a unanimous vote. Discussion was held on the function of operating limit controls, as well as the difference between operating limit controls and safety limit controls. Suggestions for revision to the interpretation response were made by Mr. Chuck Withers and Mr. Robert Wielgoszinski. A revision to the committee response to the interpretation question was made. The interpretation was approved as modified by a unanimous vote of the NBIC Committtee.		

ii. Action Items – Old Business

Item Number: NB10-1201	**NBIC Location: Part 1**	**No Attachment**
General Description: Reformat NBIC Part 1 by expanding the general requirements section **Subgroup:** Installation **Task Group:** M. Wadkinson (PM), B. Moore, S. Konopacki, E. Wiggins, D. Patten **Meeting Action:** Mr. Richards gave a progress report. An item should be ready in January 2016 for presentation to the committee.		

Item Number: NB11-1901	**NBIC Location: Part 1**	**No Attachment**

General Description: Add guidance for the safe installation of high pressure composite pressure vessels operating in close proximity to the public

Subgroup: FRP

Task Group: M. Richards (PM), S. Konopacki and D. Patten

Meeting Action: Mr. Richards gave a progress report. Mr. Richards has discussed this item with Mr. Francis Brown, but has not received a finalized document from SG FRP.

Item Number: NB12-0302 **NBIC Location: Part 1** **No Attachment**

General Description: Add installation requirements for pressure vessels for human occupancy (PVHOs)

Subgroup: Installation

Task Group: B. Moore (PM), T. Creacy, K. Watson, T. Millette, M. Richards, G. Scribner

Meeting Action: Mr. Richards gave a progress report. Work is progressing with Mr. Moore doing further research.

Item Number: NB13-1101 **NBIC Location: Part 1** **Attachment Pages 8-9**

General Description: Add installation requirements for condensing hot water boilers

Subgroup: Installation

Task Group: G. Halley (PM), M. Wadkinson, D. Patten, B. Moore, T. Millete, P. Bourgeois

Meeting Action: Mr. Richards invited Mr. Geoff Halley to report on this item. SC Installation approved this item with a unanimous vote. Mr. Halley presented on the history of the item, and key points addressed in the proposed Part 1, Supplement 6. Mr. Halley and Ms. Melissa Wadkinson answered questions on the proposed Part 1, Supplement 6. Mr. Moore provided an editorial change. This item was sent to letter ballot by unanimous vote of the NBIC Committee.

Item Number: NB14-0403 **NBIC Location: Part 1** **No Attachment**

General Description: Identify terms from Part 1 that need to be added to the index

Subgroup: Installation

Task Group: B. Moore (PM), M. Richards, T. Creacy, K. Watson, M. Washington

Meeting Action: Mr. Richards invited Mr. Brian Moore to present on this item. The task group found fourteen terms to be added to the index. In the future, index items will be deemed editorial.

Item Number: NB15-0104 **NBIC Location: Part 1, 2.5.1.3** **Attachment Pages 10-13**

General Description: Edit or remove "Guide for Feedpump Differential" table because it gives inconsistent guidance

Subgroup: Installation

Task Group: E. Wiggins (PM), D. Patten, S. Konopacki, K. Watson

Meeting Action: Mr. Richards invited Mr. Don Patten to present on a proposal for code change. The item was passed unanimously by SC Installation. Mr. Cook suggested a minor change to the proposal. Discussion was held about the purpose for the change. This item was approved as modified by a unanimous vote of the NBIC Committee.

Item Number: NB15-0105 **NBIC Location: Part 1** **No Attachment**

General Description: Research ASME B31.9 Building Piping code and assess its applicability to the NBIC

Subgroup: Installation

Task Group: M. Wadkinson (PM), D. Patten, K. Watson, S. Konopacki, B. Moore, E. Wiggins

Meeting Action: Mr. Richards invited Ms. Melissa Wadkinson to report on this item. Ms. Wadkinson advised closing this item with no action taken because B31.9 Building Piping code has been determined not to be applicable to the scope of the NBIC. The item was closed with no action taken by a unanimous vote of the NBIC Committee.

Item Number: NB15-0401 **NBIC Location: Part 1, 2.5.1.3** **Attachment Pages 14-17**

General Description: Clarify boiler feedwater pump installation requirements for power boilers

Subgroup: Installation

Task Group: E. Wiggins (PM), D. Patten, S. Konopacki, K. Watson

Meeting Action: Mr. Richards invited Mr. Don Patten to report on this item. SC Installation approved this item with a unanimous vote. Mr. Patten reported on the proposed change. Mr. Joe Ball proposed a minor revision to the wording of the proposal. The item was approved as modified by a unanimous vote of the NBIC Committee.

Item Number: NB15-1001 **NBIC Location: Part 1** **No Attachment**

General Description: Update "stamp" vs. "certification" language to maintain consistency with ASME code

Subgroup: Installation

Task Group: P. Bourgeois (PM), K. Watson, M. Richards, M. Wadkinson

Meeting Action: Mr. Richards gave a progress report. Work is progressing in coordination with National Board Staff.

Item Number: NB15-1301 **NBIC Location: Part 1, Section 2** **Attachment Page 18**

General Description: Investigate overpressure protection requirement differences between Part 1 Section 2 – Power Boilers and Part 1 Section 3 – Heating Boilers, specifically why aren't the requirements of Part 1, 3.8.1.4 duplicated in Part 1 Section 2?

Subgroup: Installation

Task Group: T. Millete (PM), M. Wadkinson, B. Moore, T. Creacy, K. Watson

Meeting Action: Mr. Richards invited Ms. Wadkinson to report. SC Installation approved this item with a unanimous vote. The item was approved by a unanimous vote of the NBIC Committee.

Item Number: NB15-1302	**NBIC Location: Part 1, 2.8.1**	**No Attachment**

General Description: Why aren't low water cutoffs required to have manual resets in Part 1, 2.8.1? Manual resets are required in NBIC Part 1 Section 3 and CSD-1 Article CW-140

Subgroup: Installation

Task Group: T. Millete (PM), M. Wadkinson, B. Moore, T. Creacy, K. Watson

Meeting Action: Mr. Richards invited Ms. Wadkinson to report. A proposal should be ready for the January 2016 meeting.

Item Number: NB15-2001	**NBIC Location: Part 1, Section 2**	**No Attachment**

General Description: Add requirements for pressure operated controls for power boilers to be consistent with CSD-1 CW-310 and NBIC Part 2, 2.2.10.6 l) 1)

Subgroup: Installation

Task Group: None assigned.

Meeting Action: Mr. Richards invited Ms. Wadkinson to report. Ms. Wadkinson suggested closing this item with no action taken due to it being addressed by NB15-1301. This item was closed with no action by a unanimous vote of the NBIC Committee.

Item Number: NB15-2101	**NBIC Location: Part 1, 2.5.3.2**	**No Attachment**

General Description: Add requirements for a lockable disconnect for power boilers, similar to requirements for heating boilers

Subgroup: Installation

Task Group: None assigned.

Meeting Action: Mr. Richards invited Ms. Wadkinson to report. Ms. Wadkinson suggested closing this item with no action taken because this item is already addressed in NBIC Part 1, 2.5.3. This item was closed with no action by a unanimous vote of the NBIC Committee.

Item Number: NB15-2202	**NBIC Location: Part 1**	**No Attachment**

General Description: Add checklist for the safe installation of high pressure composite pressure vessels operating in close proximity to the public

Subgroup: Installation

Task Group: B. Moore (PM)

History: None

Meeting Action: Mr. Richards gave a progress report. A proposal for code change should be ready for the January 2016 NBIC Meeting.

iii. Action Items – New Business

Item Number: NB15-2303	NBIC Location: Part 1	No Attachment
General Description: Review NBIC footnotes; remove footnotes that are code language or definitions **Subgroup:** Installation **Task Group:** None assigned. **Meeting Action:** Mr. Richards gave a progress report and explained the purpose of the new item.		

Item Number: NB15-0106	NBIC Location: Part 1, 3.7.5.1	No Attachment
General Description: Address Figure 3.7.5.1 **Subgroup:** Installation **Task Group:** B. Moore (PM), T. Creacy, and M. Washington **Meeting Action:** Mr. Richards gave a progress report and explained the purpose of the new item. Mr. Brian Moore has been assigned as progress report.		

Item Number: NB15-0107	NBIC Location: Part 1, 3.8.2.3	No Attachment
General Description: To address 3.8.2.3 with BPV IV and CSD-1 **Subgroup:** Installation **Task Group:** M. Wadkinson (PM) **Meeting Action:** Mr. Richards gave a progress report and explained the purpose of the new item. Ms. Wadkinson explained that this item will be developed in accordance with ASME Section IV and ASME CSD-1. The purpose of this item is to harmonize language between the NBIC and these two other standards.		

Item Number: NB15-0108	NBIC Location: Part 1	No Attachment
General Description: Add a supplement to address high temperature hot water boilers **Subgroup:** Installation **Task Group:** M. Wakdinson (PM) B. Moore, T. Creacy, D. Patten and P. Bourgeois **Meeting Action:** Mr. Richards invited Ms. Wadkinson to present on this item. Ms. Wadkinson explained the purpose of this new item. A proposal should be ready for the January 2016 meeting.		

At the conclusion of Mr. Richard's report on SC Installation, Mr. Angelo Bramucci took a seat with the NBIC Committee as Domenic Canonico's designated alternate.

b. Subcommittee on Inspection

Mr. Cook invited Subcommittee on Inspection Chair Mr. Mark Mooney to report on the activities of SC Inspection. Mr. Mooney presented on the following:

i. Interpretations

No interpretations were assigned to the Subcommittee on Inspection.

ii. Action Items – Old Business

Item Number: NB07-0910	**NBIC Location: Part 2, S6**	**No Attachment**
General Description: Review of Part 2 S6 for completeness and accuracy **Subgroup:** Inspection **Task Group:** S. Staniszewski (PM), G. McRae, J. Riley, C. Withers **Meeting Action:** Mr. Mooney invited Mr. Stan Staniszewski to report on this item. Mr. Staniszewski presented news from the U.S. Department of Transportation in relation to this item. The DOT is working to incorporate by reference the 2015 edition of the NBIC.		

Item Number: NB11-0204A	**NBIC Location: Part 2, S2**	**No Attachment**
General Description: Review NDE requirements for stayed areas on historical boilers **Subgroup:** Historical **Task Group:** M. Wahl (PM), J. Larson, F. Johnson **Meeting Action:** Mr. Mooney gave a progress report. No action was taken.		

Item Number: NB11-1805	**NBIC Location: Part 2**	**Attachment Pages 19-21**
General Description: Staybolts **Subgroup:** Locomotive **Task Group:** Unknown **Meeting Action:** Mr. Mooney gave a progress report. SC Inspection unanimously approved this item. This item was approved by a unanimous vote of the NBIC Committee.		

Item Number: NB12-1501	**NBIC Location: Part 2**	**No Attachment**
General Description: Review inspection requirements to ensure they align with installation requirements in NBIC Part 1 **Subgroup:** Inspection **Task Group:** V. Newton (PM), M. Horbaczewski, J. Daiber, J. Safarz **Meeting Action:** Mr. Mooney gave a progress report. Mr. Newton gave a further update, and told the committee that new items have been opened to address individual items, and there is no further work to be accomplished with this item. Mr. Newton suggested that the item be closed. This item was closed by a unanimous vote of the NBIC Committee.		

Item Number: NB13-0903	NBIC Location: Part 2, S2.14	No Attachment

General Description: Add safety requirements for use of liquid or gaseous fuels to fire a historical boiler

Subgroup: Historical

Task Group: D. Rupert (PM), T. Dillon, J. Larson, R. Bryce

Meeting Action: Mr. Mooney gave a progress report. A new task group was assigned to accelerate work on this item. The project manager is Mr. Denis Rupert.

Item Number: NB13-1002	NBIC Location: Part 2	No Attachment

General Description: Review inspection requirements against ASME B31.1 Power Piping code

Subgroup: Inspection

Task Group: M. Schwartzwalder (PM), J. Frey, V. Newton, M. Mooney, D. Canonico, M. Horbaczewski, B. Dobbins

Meeting Action: Mr. Mooney gave a progress report. The task group is working on addressing comments received via letter ballot. A proposal should be ready for the January 2016 meeting.

Item Number: NB13-1301	NBIC Location: Part 2	Attachment Pages 22-27

General Description: Review finite element analysis methods and how they pertain to inspection

Subgroup: Inspection

Task Group: J. Riley (PM), S. Staniszewski, M. Schwartzwalder, M. Mooney, R. Pate

Meeting Action: Mr. Mooney gave a progress report. SC Inspection approved this item with a unanimous vote. Mr. Mooney proposed this item be sent to letter ballot to allow for more detailed review. This item was sent to letter ballot through a unanimous vote of the NBIC Committee.

Item Number: NB13-1302	NBIC Location: Part 2	Attachment Pages 28-29

General Description: Review inspection requirements for cryogenic pressure vessels

Subgroup: Inspection

Task Group: J. Riley (PM), A. Renaldo, R. Dobbins, R. Bartley, R. Pate, D. Graf

Meeting Action: Mr. Mooney gave a progress report. SC Inspection approved this item with a unanimous vote. Mr. Mooney proposed this item be sent to letter ballot to allow for more detailed review. This item was sent to letter ballot based on a unanimous vote of the NBIC Committee.

Item Number: NB13-1303	NBIC Location: Part 2	Attachment Pages 30-32

General Description: Review inspection requirements for biomass fired boilers

Subgroup: Inspection

Task Group: M. Mooney (PM), M. Horbaczewski, D. Canonico, J. Safarz

Meeting Action: Mr. Mooney gave a progress report. SC Inspection approved this item with a unanimous vote. Mr. Mooney proposed this item be sent to letter ballot to allow for more detailed review. This item was sent to letter ballot based on a unanimous vote of the NBIC Committee.

Item Number: NB13-1404B	**NBIC Location: Part 2, S1**	**No Attachment**

General Description: Review requirements for fillet welded staybolts

Subgroup: Locomotive

Task Group: R. Stone (PM)

Meeting Action: Mr. Mooney requested this item be closed with no action taken because two similar items NB15-1701 and NB15-1702 had already been opened. This item was closed with no action taken by a unanimous vote of the NBIC Committee.

Item Number: NB13-1406	**NBIC Location: Part 2, S1**	**No Attachment**

General Description: Add requirements for inspection of superheater units

Subgroup: Locomotive

Task Group: R. Stone (PM)

Meeting Action: Mr. Mooney gave a progress report. No action was taken.

Item Number: NB13-1409	**NBIC Location: Part 2, S1**	**No Attachment**

General Description: Address method for analyzing bulges created by overheating in stayed boiler surfaces

Subgroup: Inspection

Task Group: M. Mooney (PM), R. Stone

Meeting Action: Mr. Mooney gave a progress report. A task group was assigned and Mr. Mooney plans on talking to the initiator of the item, Mr. Robert Stone.

Item Number: NB13-1701	**NBIC Location: Part 2, 2.3.6.6**	**Attachment Pages 33-36**

General Description: Review inspection requirements for wire wound pressure vessels

Subgroup: Inspection

Task Group: R. Dobbins (PM), M. Mooney, J. Riley, V. Scarcella, G. Galanes

Meeting Action: Mr. Mooney requested this item be sent to letter ballot. Mr. Paul Edwards requested a background statement with items like this in the future, as well as information on what references were used to create the document. This item was sent to letter ballot based on a unanimous vote of the NBIC Committee.

Item Number: NB14-0901	**NBIC Location: Part 2**	**No Attachment**

General Description: Review inspection requirements for pressure vessels designed for high pressures

Subgroup: Inspection

Task Group: M. Horbaczewski (PM), M. Schwartzwalder, D. Graf, G. Scribner

Meeting Action: Mr. Mooney gave a progress report. The task group is looking into various reference documents before further work will progress.

Item Number: NB14-1001	NBIC Location: Part 2, 5.2.1	No Attachment

General Description: Add requirements to address replacement of duplicate nameplates where the original nameplate is intact and attached to an inner vessel, where it may or may not be visible

Subgroup: Inspection

Task Group: J. Larson (PM), P. Welch, D. Ford, R. Pate, J. Getter, G. McRae, M. Horbaczewski, B. Petersen

Meeting Action: Mr. Mooney gave a progress report. This item is being sent to letter ballot for the SC Inspection.

Item Number: NB14-1101	NBIC Location: Part 2	No Attachment

General Description: Diaphragm weld inspection.

Subgroup: Inspection

Task Group: P. Welch (PM), D. Graf, R. Stone

Meeting Action: Mr. Mooney gave a progress report. A task group was assigned and Mr. Mooney plans on talking to the initiator of the item, Mr. Robert Stone.

Item Number: NB14-1701	NBIC Location: Part 2	No Attachment

General Description: Add diagrams for local thin areas (LTAs) for low pressure propane tanks

Subgroup: Inspection

Task Group: G. McRae (PM), T Vandini, J. Getter, M. Mooney

Meeting Action: Mr. Mooney gave a progress report. Mr. McRae wasn't present at the meeting so no report was given.

Item Number: NB14-1801	NBIC Location: Part 2	No Attachment

General Description: Ferrules

Subgroup: Inspection

Task Group: R. Stone (PM)

Meeting Action: Mr. Mooney gave a progress report. Mr. Mooney plans on talking to the initiator of the item, Mr. Robert Stone to get more information on the purpose of his code change request.

Item Number: NB14-1802	NBIC Location: Part 2	No Attachment

General Description: Riveted staybolt head dimensions and Figure S1.2.2-c

Subgroup: Inspection

Task Group: R. Stone (PM)

Meeting Action: Mr. Mooney gave a progress report. Mr. Mooney plans on talking to the initiator of the item, Mr. Robert Stone to get more information on the purpose of his code change request.

Item Number: NB15-0201 **NBIC Location: Part 2** **No Attachment**

General Description: Provide consistent language in all areas of the NBIC affected by the closure of NB13-0701

Subgroup: Inspection

Task Group: J. Riley (PM), M. Mooney, T. Vandini, M. Clark, G. McRae

Meeting Action: Mr. Mooney gave a progress report. Mr. Newton reported that many inconsistencies have been noted based on an item passed on pitting, and work is progressing to address those inconsistencies.

Item Number: NB15-0204 **NBIC Location: Part 2, 5.5.2** **No Attachment**

General Description: Investigate Part 2, 5.5.2 and 5.5.3 for consistency with requirements about replacement of stamping during inservice inspection generated from NB12-1801

Subgroup: Inspection

Task Group: B. Petersen (PM), P. Welch, C. Withers

Meeting Action: Mr. Mooney gave a progress report. Work is progressing to refine the language of the proposal.

Item Number: NB15-0501 **NBIC Location: Part 2, 7.10 h)** **Attachment Pages 37-38**

General Description: Result of PR15-0142, should an R-1/R-2 form by required for underground service change?

Subgroup: Inspection

Task Group: T. Vandini (PM), G. McRae, J. Getter, D. Graf

Meeting Action: Mr. Mooney gave a report. SC Inspection approved this item with a unanimous vote. Mr. Mooney requested that SC Repairs and Alterations open an item to address this issue in Part 3. Mr. Carter requested a minor change to the wording of the item. The item was approved as modified by a unanimous vote of the NBIC Committee.

Item Number: NB15-0502 **NBIC Location: Part 2, 7.10 k)** **No Attachment**

General Description: Result of PR15-0143, examine requirements for welding qualifications as it relates to pressure vessels in LPG service

Subgroup: Inspection

Task Group: T. Vandini (PM), G. McRae, J. Getter, D. Graf

Meeting Action: Mr. Mooney requested this item be closed after examination of welding qualifications showed that no change was needed. This item was closed by a unanimous vote of the NBIC Committee.

Item Number: NB15-0503 NBIC Location: Part 2, CO2 Supplement No Attachment

General Description: Result of PR15-0704, the term "Examination" is used throughout S10.6, S10.7, and S10.9, was this intended to read "Inspection" instead, which is a duty of the Inspector?

Subgroup: Inspection

Task Group: B. Dobbins (PM), R. Pate, P. Welch

Meeting Action: Mr. Mooney gave a progress report, stating that the committee believes the wording as it currently stands is correct. Mr. Mooney suggested the item be closed with no action. The public review commmenter Mr. Nathan Carter expressed his agreement with the committee action. The item was closed with no action by a unanimous vote of the NBIC Committee.

Item Number: NB15-0504 NBIC Location: Part 2, S10 No Attachment

General Description: Result of PR15-0701, PR15-0702 and PR15-0703, clarify what the National Board Commissioned Inspector's specific duties are when inspecting high pressure composite vessels

Subgroup: Inspection

Task Group: E. Brantly (PM), M. Mooney, M. Horbaczewski, E. Brantly, V. Newton

Meeting Action: Mr. Mooney gave a progress report. A new project manager Mr. Ernest Brantley was assigned.

Item Number: NB15-0701 NBIC Location: Part 2, 2.3.6.8 Attachment Pages 39-41

General Description: Result of PR15-0204, PR15-0601 and PR15-0401, clarify inspection requirements for pressure vessels for human occupancy (PVHOs)

Subgroup: Inspection

Task Group: M. Mooney (PM), Buechel, Bechal

Meeting Action: Mr. Mooney gave a progress report. SC Inspection approved this item with a unanimous vote of the NBIC Committee. Mr. Mooney requested this item be sent to letter ballot. This item was sent to letter ballot by a unanimous vote of the NBIC Committee.

Item Number: NB15-0801 NBIC Location: Part 2, CO2 Supplement Attachment Page 42-46

General Description: Result of PR15-0602, clarify which inspection requirements for CO2 pressure vessels apply specifically to the National Board Commissioned Inspector

Subgroup: Inspection

Task Group: M. Mooney (PM), P. Welch, V. Newton, T. Barker

Meeting Action: Mr. Mooney gave a progress report. This item was addressed in unison with NB15-0901. SC Inspection approved this item with a unanimous vote. Mr. Mooney requested this item be sent to letter ballot for NBIC Committee vote. This item was sent to letter ballot by a unanimous vote of the NBIC Committee.

Item Number: NB15-0901	NBIC Location: Part 2, CO2 Supplement	Attachment Pages 42-46

General Description: Result of PR15-0205, PR15-0206, PR15-0207, PR15-0208, PR15-0209, PR15-0210, PR15-0211 and PR15-0402, address issues in the CO2 supplement regarding requirements for inspection of equipment that are outside of the scope of insurance policies that insurance companies issue

Subgroup: Inspection

Task Group: M. Mooney (PM), P. Welch, V. Newton, T. Barker, E. Brantly

Meeting Action: Mr. Mooney gave a progress report. This item was addressed in unison with NB15-0801. SC Inspection approved this item with a unanimous vote. Mr. Mooney requested this item be sent to letter ballot for NBIC Committee vote. This item was sent to letter ballot by a unanimous vote of the NBIC Committee.

Item Number: NB15-1002	NBIC Location: Part 2	No Attachment

General Description: Update "stamp" vs. "certification" language to maintain consistency with ASME code

Subgroup: Inspection

Task Group: D. Graf (PM), P. Welch

Meeting Action: Mr. Mooney gave a progress report. A task group was assigned.

Item Number: NB15-1601	NBIC Location: Part 2, S2.11 b) 2)	No Attachment

General Description: Requirements for the removal of jacketing/lagging insulation for inservice inspections of historical boilers

Subgroup: Historical

Task Group: T. Dillon (PM), J. Amato

Meeting Action: Mr. Mooney gave a progress report. More information is required from SG Historical Boilers before work can continue.

Item Number: NB15-1701	NBIC Location: Part 2	Attachment Page 47

General Description: Fillet welded staybolt inspection

Subgroup: Locomotive

Task Group: None assigned

Meeting Action: Mr. Mooney gave a progress report. A proposal for code change was presented. The proposal was approved by SC Inspection with a unanimous vote. Several minor wording changes were suggested. The item was approved as modified by a unanimous vote of the NBIC Committee.

Item Number: NB15-2102	NBIC Location: Part 2, 2.1 & 2.2.1	No Attachment

General Description: Combine scopes found in 2.1 and 2.2.1

Subgroup: Inspection

Task Group: None assigned

Meeting Action: Mr. Mooney gave a progress report. Mr. Mooney suggested this item be closed with no action taken, because the scopes relate to two separate parts of the code. This item was closed with no action by a unanimous vote of the NBIC Committee.

Item Number: NB15-2103	**NBIC Location: Part 2, S7.8.6 & S7.9**	**No Attachment**

General Description: Update Part 2, S7 for consistency with new requirements in Part 2, S9

Subgroup: Inspection

Task Group: D. Buechel, T. Vandini

Meeting Action: Mr. Mooney gave a progress report. A task group was formed of Dave Buechel and Tom Vandini.

Item Number: NB15-2201	**NBIC Location: Part 2, S10**	**No Attachment**

General Description: Edit Supplement 10 on inspection of stationary high pressure composite pressure vessels

Subgroup: FRP

Task Group: None assigned

Meeting Action: Mr. Mooney gave a progress report. This item is being sent to SC Inspection letter ballot.

Item Number: NB15-2301	**NBIC Location: Part 2, S6**	**No Attachment**

General Description: Edit supplement 6 glossary term "Flammable Gases" for greater clarity

Subgroup: Inspection

Task Group: None assigned

Meeting Action: Mr. Mooney gave a progress report. Mr. Mooney suggested the item be closed with no action taken, because the definition matches definitions found in federal regulations. This item was closed with no action taken.

Item Number: NB15-2302	**NBIC Location: Part 2, Section 5**	**Attachment Pages 48-49**

General Description: Edit NB forms to say "pressure test" instead of "hydro test"

Subgroup: Inspection

Task Group: None assigned

Meeting Action: Mr. Mooney gave a progress report. Mr. Mooney presented a proposal for code change. This item was approved by SG Inspection with a unanimous vote. The item was approved by a unanimous vote of the NBIC Committee.

iii. Action Items – New Business

Item Number: NB15-2304	NBIC Location: Part 2	No Attachment
General Description: Review NBIC footnotes; remove footnotes that are code language or definitions **Subgroup:** Inspection **Task Group:** M. Horbaczewski, C. Withers **Meeting Action:** Mr. Mooney gave a progress report. A task group was formed of Mr. Chuck Withers and Mr. Mark Horbaczewski.		

c. Subcommittee on Repairs and Alterations

Mr. Cook invited Subcommittee on Repairs and Alterations Chair Mr. George Galanes to report on the activities of SC Repairs and Alterations. Mr. Galanes presented on the following:

i. Interpretations

Item Number: IN14-0701	NBIC Location: Part 3	Attachment Page 50
General Description: Interpretation question regarding certification required and documentation of post weld heat treatment **Subgroup:** Repairs and Alterations **Task Group:** Unknown **Meeting Action:** Mr. Galanes gave a report. Mr. Galanes explained that the item had been withdrawn after receiving insufficient letter ballot response in an NBIC Committee letter ballot. SC Repairs and Alterations reaffirmed their response to the interpretation question. Mr. Galanes suggested this item be sent to letter ballot. This item was sent for a letter ballot vote by a unanimous vote of the NBIC Committee.		

Item Number: IN14-0801	NBIC Location: Part 3, 3.3.3) s)	Attachment Pages 51-52
General Description: Interpretation question clarifying definition of "minimum required thickness" required on U-1 form as nominal wall thickness minus corrosion allowance **Subgroup:** Repairs and Alterations **Task Group:** Brian Morelock (PM) **Meeting Action:** Mr. Galanes invited Mr. Morelock to report. Mr. Morelock explained that the item had been withdrawn after receiving insufficient letter ballot response in an NBIC Committee letter ballot. SC Repairs and Alterations reaffirmed their response to the interpretation question Mr. Morelock suggested this item be sent to letter ballot. This item was sent for a letter ballot vote by a unanimous vote of the NBIC Committee. Discussion was held about letter balloting procedures.		

Item Number: IN15-0201	NBIC Location: Part 3	No Attachment
General Description: Interpretation question regarding "R" Symbol Stamp quality system. **Subgroup:** Repairs and Alterations		

Task Group: R. Wielgoszinski, B. Schaefer, R. Troutt

Meeting Action: Mr. Galanes gave a progress report. A task group has been assigned of R. Wielgoszinski, B. Schaefer, and R. Troutt.

Item Number: IN15-0401	NBIC Location: Part 3, 4.2, 4.4	No Attachment

General Description: May Phased Array UT (PAUT) examination be used for verification of final circumferential weld repair integrity in lieu of pressure testing or other typical NDE methods (MT/PT/RT)involving boiler tubes where the thickness is below ½ inch, with NPS of 4 inch and less?

Subgroup: Repairs and Alterations

Task Group: George Galanes (PM), Frank Johnson, Jim Sekely, and Warren Taylor

Meeting Action: Mr. Galanes gave a progress report. Mr. Galanes has been assigned as project manager. The interpretation requester, Mr. Jamie Walker, presented on the purpose of this interpretation question.

ii. Action Items – Old Business

Item Number: NB11-0204B	NBIC Location: Part 3, S2	No Attachment

General Description: Review NDE requirements of stayed areas for historical boilers

Subgroup: Historical

Task Group: M. Wahl (PM), J. Larson, F. Johnson

Meeting Action: Mr. Galanes gave a progress report. No action was taken.

Item Number: NB12-0801	NBIC Location: Part 3	No Attachment

General Description: Add requirements for repair and alteration of gasketed PHEs in the field

Subgroup: Repairs and Alterations

Task Group: R. Cauthon (PM), B. Wielgoszinksi, N. Carter

Meeting Action: Mr. Galanes invited Mr. Randy Cauthon to give a report on the status of this item. Mr. Cauthon explained this item is being developed in accordance with ASME Section VIII, and there will be coordination with the ASME committees as this item is worked on.

Item Number: NB13-0403	NBIC Location: Part 3, S1.9.2	No Attachment

General Description: Add requirements for installation of boiler arch tubes

Subgroup: Locomotive

Task Group: Unknown

Meeting Action: Mr. Galanes suggested this item be closed with no action, with the support of SG Locomotive Chair Mr. Linn Moedinger, who reported that SG Locomotive had no information on the history or purpose of this item. This item was closed with no action by a unanimous vote of the NBIC Committee.

Item Number: NB13-0902	NBIC Location: Part 3, S2	No Attachment

General Description: Review alternate methods of tube sheet repair

Subgroup: Historical

Task Group: F. Johnson, T. Dillon, M. Wahl

Meeting Action: Mr. Galanes gave a progress report. There is no action to report.

Item Number: NB13-1401	NBIC Location: Part 3, S1.9.2	No Attachment

General Description: Add wording in this section regarding boiler tube welding

Subgroup: Locomotive

Task Group: R. Stone (PM)

Meeting Action: Mr. Galanes gave a progress report. This item is being sent for review and comment letter ballot to SC Repairs and Alterations. A proposal for the NBIC Committee should be ready by January 2016.

Item Number: NB13-1403	NBIC Location: Part 3	No Attachment

General Description: Installation of boiler tubes and arch tubes

Subgroup: Repairs and Alterations

Task Group: R. Stone (PM)

Meeting Action: Mr. Galanes suggested this item be closed with no action, with the support of SG Locomotive Chair Mr. Linn Moedinger due to lack of clarity on the purpose of the item.. This item was closed with no action by a unanimous vote of the NBIC Committee.

Item Number: NB13-1404A	NBIC Location: Part 3, S1	No Attachment

General Description: Add requirements for fillet welding staybolts in locomotive boilers

Subgroup: Locomotive

Task Group: R. Stone (PM)

Meeting Action: Mr. Galanes suggested this item be closed with no action, with the support of SG Locomotive Chair Mr. Linn Moedinger due to lack of clarity on the purpose of the item.. This item was closed with no action by a unanimous vote of the NBIC Committee.

Item Number: NB13-1405	NBIC Location: Part 3, S1.2.9	No Attachment

General Description: Add requirements for throttle pipes, dry pipes, superheater headers, and front end steam pipes

Subgroup: Locomotive

Task Group: R. Stone (PM)

Meeting Action: Mr. Galanes gave a progress report. No action was taken.

Item Number: NB13-1407	**NBIC Location: Part 3, S1**	**No Attachment**

General Description: Add requirements for repair and alteration of bolts, nuts, and studs in locomotive boilers

Subgroup: Locomotive

Task Group: R. Stone (PM)

Meeting Action: Mr. Galanes gave a progress report. A proposal was prepared by SG Locomotive Boilers. SC Repairs and Alterations will vote to approve this item by letter ballot.

Item Number: NB13-1408	**NBIC Location: Part 3, S1**	**No Attachment**

General Description: Add requirements for repair and alteration of locomotive boilers with threaded boiler studs of the taper thread and straight thread varieties

Subgroup: Locomotive

Task Group: R. Stone (PM)

Meeting Action: Mr. Galanes gave a progress report. This item is being sent for letter ballot vote to SC Repairs and Alterations.

Item Number: NB14-0203	**NBIC Location: Part 3**	**Attachment Pages 53-59**

General Description: Review Part 3 for any changes needed to be made to "R" accreditation requirements

Subgroup: Repairs and Alterations

Task Group: R. Trout, N. Carter, R. Cauthon

Meeting Action: Mr. Galanes gave a progress report. SC Repairs and Alterations addressed negatives from a previous letter ballot. SC Repairs and Alterations approved the revised text unanimously. Mr. Galanes suggested this item be sent to letter ballot for approval. This item was sent to letter ballot by a unanimous vote of the NBIC Committee.

Item Number: NB14-0301	**NBIC Location: Part 3**	**No Attachment**

General Description: Add requirements for encapsulation

Subgroup: Repairs and Alterations

Task Group: B. Boseo, F. Johnson, K. Moore

Meeting Action: Mr. Galanes invited Mr. Robert Wielgoszinski to give a progress report. Mr. Wielgoszinski summarized the discussion at the SC Repairs and Alterations meeting, and notified that Mr. Frank Johnson and Ms. Kathy Moore have been added to the task group.

Item Number: NB14-0302	**NBIC Location: Part 3, S6**	**No Attachment**

General Description: Develop additional "TR" forms to include in Part 3

Subgroup: Repairs and Alterations

Task Group: C. Withers (PM), B. Underwood, K. Moore, B. Vallance

Meeting Action: Mr. Galanes invited Mr. Chuck Withers to give a progress report. Mr. Withers explained the history of the item and current progress.

Item Number: NB14-0701	**NBIC Location: Part 3, 3.2.2 c)**	**Attachment Pages 60-65**

General Description: Result of IN13-0301, clarify requirements about an "R" certificate holder using an ASME pressure part they fabricated in a separate repair or alteration they are performing

Subgroup: Repairs and Alterations

Task Group: B. Wielgoszinski

Meeting Action: Mr. Galanes invited Mr. Robert Wielgoszinski to present a proposal for code change. Mr. Wielgoszinski explained the purpose of the item, and reported on discussion of negative votes from a previous letter ballots. Discussion addressed the concerns expressed in the letter ballot negative votes, so no change was made from the previously letter balloted proposal. SC Repairs and Alterations approved this item with two abstentions. This item was approved by the NBIC Committee with two abstentions from Ron Pulliam and Paul Edwards.

Item Number: NB14-1102	**NBIC Location: Part 3**	**No Attachment**

General Description: Diaphragm Weld Repair

Subgroup: Repairs and Alterations

Task Group: R. Stone (PM)

Meeting Action: Mr. Galanes suggested this item be closed with no action, with the support of SG Locomotive Chair Mr. Linn Moedinger due to lack of clarity on the purpose of the item.. This item was closed with no action by a unanimous vote of the NBIC Committee.

At the conclusion of Mr. Galanes' report on NB14-1102, Ms. Melissa Wadksinson took a seat with the NBIC Committee as Paul Edwards' designated alternate. Also, Mr. Ben Schaefer took a seat with the NBIC Committee as Bryan Schulte's designated alternate.

Item Number: NB14-2401	**NBIC Location: Part 3, S6.5**	**No Attachment**

General Description: Replace the referenced TR-1 form with a TR-3 form

Subgroup: Repairs and Alterations

Task Group: C. Withers (PM), B. Underwood, K. Moore, B. Vallance

Meeting Action: Mr. Galanes gave a progress report. No action has been taken.

Item Number: NB14-2402	**NBIC Location: Part 3, S6.3**	**No Attachment**

General Description: Remove "TR" accreditation requirements from the NBIC because "TR" accreditation requirements will be addressed in a separate National Board "TR" document

Subgroup: Repairs and Alterations

Task Group: C. Withers (PM), B. Underwood, K. Moore, B. Vallance

Meeting Action: Mr. Galanes gave a progress report. Work is continuing.

Item Number: NB15-0509	**NBIC Location: Part 3, 2.5.3.6**	**Attachment Page 66**

General Description: Originally contained PR15-0157, PR15-0158, PR15-0156, and PR15-0501; now only addressing PR15-0156 and PR15-0501 regarding use of propriety filler metal names in Welding Method 6

Subgroup: Repairs and Alterations

Task Group: R. Trout, J. Amato, J. Pillow

Meeting Action: Mr. Galanes gave a progress report. Mr. Galanes presented a proposal for code change. SC Repairs and Alterations approved this proposal with a unanimous vote. This item was approved with a unanimous vote of the NBIC Committee.

Item Number: NB15-0511	**NBIC Location: Part 3, 5.13.5.1**	**No Attachment**

General Description: Result of PR15-0120, how does one fill out "NR" paperwork if the repairs or alterations were performed to an international code other than Section III or Section XI?

Subgroup: Repairs and Alterations

Task Group: P. Edwards (PM), B. Schafer, B. Wielgoszinski, C. Withers

Meeting Action: Mr. Galanes invited Mr. Chuck Withers to give a report on this item. Mr. Withers discussed the activities of the "NR" Task Group meeting on Monday, July 13th.

Item Number: NB15-0512	**NBIC Location: Part 3, S3.5.5 b)**	**No Attachment**

General Description: Result of PR15-0121, should UIG-79 and UIG-80 be referenced in their entirety in this section?

Subgroup: Graphite

Task Group: E. Soltow (PM)

Meeting Action: Mr. Galanes gave a progress report. No action has been taken.

Item Number: NB15-1003	**NBIC Location: Part 3**	**www.nbicshare.org**

General Description: Update "stamp" vs. "certification" language to maintain consistency with ASME code

Subgroup: Repairs and Alterations

Task Group: R. Troutt (PM), J. Amato, J. Pillow

Meeting Action: Mr. Galanes gave a progress report. The item is being reviewed for further work.

Item Number: NB15-1101	**NBIC Location: Part 3**	**No Attachment**

General Description: Investigate code addition for carbon fiber wrap reinforcement of high pressure

metal pressure vessels

Subgroup: Repairs and Alterations

Task Group: R. Trout, J. Amato, J. Pillow

Meeting Action: Mr. Galanes gave a progress report. A presentation was given by HJ3 Composite Technologies to SG Repairs and Alterations. A task group was formed to investigate fiber wrap reinforcement.

Item Number: NB15-1201 **NBIC Location: Part 3, 5.6** **No Attachment**

General Description: Expand requirements for form logs in Section 5 to include not only "R" program, but also "VR" and "NR"

Subgroup: Repairs and Alterations

Task Group: C. Withers

Meeting Action: Mr. Galanes gave a progress report. More information from National Board staff needs to be obtained before work can continue.

Item Number: NB15-1401 **NBIC Location: Part 3, Section 3** **No Attachment**

General Description: Investigate new requirements for weld buildup of thin walled tubes

Subgroup: Repairs and Alterations

Task Group: W. Sperko (PM), G. Galanes, J. Siefert

Meeting Action: Mr. Galanes reported that no progress has been made on this item.

Item Number: NB15-1402 **NBIC Location: Part 3, 2.5.3.6** **Attachment Pages 67-68**

General Description: Result of PR15-0157 and PR15-0158, investigate appropriate humidity protection for materials used in Welding Method 6

Subgroup: Repairs and Alterations

Task Group: G. Galanes (PM), J. Seifert, N. Carter

Meeting Action: Mr. Galanes presented a proposal for code change. SC Repairs and Alterations approved this item with a unanimous vote. This item was approved with a unanimous vote of the NBIC Committee. Mr. Galanes explained EPRI's testing in regards to Welding Method 6.

Item Number: NB15-1403 **NBIC Location: Part 3** **Attachment Pages 69-74**

General Description: Create a new supplement on weld repair to CSEF Grade 91 steel

Subgroup: Repairs and Alterations

Task Group: G. Galanes (PM), J. Siefert

Meeting Action: Mr. Galanes gave a progress report. Mr. Galanes explained the purpose of the item, and presented a rough draft document for the proposed supplement. SC Repairs and Alterations will

letter ballot this proposal for approval. The proposal will be sent to the NBIC Committee for a review and comment letter ballot.

Item Number: NB15-1404	NBIC Location: Part 3, 1.6.1, 3.2.1	No Attachment

General Description: Define "existing material" as used in 1.6.1 and 3.2.1

Subgroup: Repairs and Alterations

Task Group: W. Jones (PM), M. Toth, J. Amato, R. Troutt

Meeting Action: Mr. Galanes invited Mr. Wayne Jones to give a progress report. Mr. Jones reported that a proposal should be ready for the January 2016 meeting.

Item Number: NB15-1410	NBIC Location: Part 3, S6.14	No Attachment

General Description: Result of PR15-0122, add requirements for the number of repairs or alterations allowed under a single nameplate/stamping

Subgroup: Repairs and Alterations

Task Group: C. Withers (PM), B. Underwood, K. Moore, B. Vallance

Meeting Action: Mr. Galanes stated there is nothing to report on this item.

Item Number: NB15-1602	NBIC Location: Part 3, S2.7.1	No Attachment

General Description: Revise material list for historical boiler reports to include bolts, studs, buts and formed pressure parts

Subgroup: Historical

Task Group: T. Dillon (PM), M. Wahl, G. Galanes

Meeting Action: Mr. Galanes stated there is nothing to report on this item.

Item Number: NB15-1702	NBIC Location: Part 3	Attachment Page 75

General Description: Fillet welded staybolt repair

Subgroup: Locomotive

Task Group: L. Moedinger (PM)

Meeting Action: Mr. Galanes presented a proposal for a code change. This item was approved by SC Repairs and Alterations with one negative and two abstentions. Mr. Frank Johnson explained the reasoning for his negative vote in the SC Repairs and Alterations. Mr. Robert Wielgoszinski explained the rationale behind the proposed code change. The purpose of the code change is to bring the NBIC requirements in accord with national and international construction codes. This item was sent to letter ballot by a unanimous vote of the NBIC Committee.

Item Number: NB15-1703	NBIC Location: Part 3	No Attachment

General Description: Welded staybolt procedures

Subgroup: Locomotive

Task Group: None assigned

Meeting Action: Mr. Galanes reported that no action has been taken.

Item Number: NB15-1801	NBIC Location: Part 3	Attachment Pages 76-79

General Description: Assuring leak tightness by seal welding

Subgroup: Repairs and Alterations

Task Group: M. Webb (PM)

Meeting Action: Mr. Galanes invited Mr. Michael Webb to report on this item. Mr. Webb presented a proposal for code change. SC Repairs and Alterations approved this item with a unanimous vote. The committee discussed the effects of seal welding inspection openings, and whether this seal welding should be considering a routine repair. This item was sent to letter ballot by a unanimous vote of the NBIC Committee.

Item Number: NB15-1901	NBIC Location: Part 3	No Attachment

General Description: Address the performance of postweld heat treatment on PRIs that were not previously postweld heat treated

Subgroup: Repairs and Alterations

Task Group: B. Wielgoszinski (PM)

Meeting Action: Mr. Galanes invited Mr. Wielgoszinski to give a progress report. Mr. Wielgoszinski reported that no action has been taken.

Item Number: NB15-2501	NBIC Location: Part 3, 3.3.4.10	No Attachment

General Description: Bolts, Screws, Studs, Nuts, and Washers

Subgroup: Repairs and Alterations

Task Group: None assigned

Meeting Action: Mr. Galanes suggested this item be closed with no action, with the support of SG Locomotive Chair Mr. Linn Moedinger due to lack of clarity on the purpose of the item. This item was closed with no action by a unanimous vote of the NBIC Committee.

Item Number: NB15-2601	NBIC Location: Part 3	Attachment Pages 80-81

General Description: Provide minimum radius dimensions of flush patches

Subgroup: Repairs and Alterations

Task Group: R. Wielgoszinski (PM)

Meeting Action: Mr. Galanes invited Mr. Robert Wielgoszinski to give a progress report. Mr. Wielgoszinski presented a proposal for code change to the NBIC Committee. SC Repairs and Alterations approved this item with a unanimous vote. Discussion was held about the methodology for determining the code change. The proposal was modified at the suggestion of Mr. Galanes. This item

was sent to letter ballot as modified by a unanimous vote of the NBIC Committee.

iii. Action Items – New Business

Item Number: NB15-1902	**NBIC Location: Part 3**	**Attachment Pages 82-83**

General Description: Address the performance of postweld heat treatment on PRIs that were not previously postweld heat treated

Subgroup: Repairs and Alterations

Task Group: G. Galanes (PM), N. Carter, W. Sperko

Meeting Action: Mr. Galanes presented a proposal for code change for Welding Method 6, based on comments received from EPRI. SC Repairs and Alterations approved this proposal with a unanimous vote. Discussion was held about safety proof testing by EPRI that support the proposed changes. This item was approved by a unanimous vote of the NBIC Committee.

Item Number: NB15-1903	**NBIC Location: Part 3, 2.5.3.6**	**Attachment Page 84**

General Description: Revised text of Weld Method 6

Subgroup: Repairs and Alterations

Task Group: B. Vallance (PM)

Meeting Action: Mr. Galanes presented a proposal for a code change about distribution of "R" forms. SC Repairs and Alterations approved this item with a unanimous vote. The item was approved by a unanimous vote of the NBIC Committee.

Item Number: NB15-2305	**NBIC Location: Part 3**	**No Attachment**

General Description: Review NBIC footnotes; remove footnotes that are code language or definitions

Subgroup: Repairs and Alterations

Task Group: R. Troutt, J. Pillow

Meeting Action: Mr. Galanes gave a progress report on footnote review for NBIC Part 3. Mr. Rob Troutt and Mr. Jim Pillow were assigned to the task group.

Item Number: NB15-2502	**NBIC Location: Part 3, Section 3**	**No Attachment**

General Description: Guidelines for Installation of Boiler Tubes in Watertube Boilers

Subgroup: Repairs and Alterations

Task Group: R Trout(PM), J. Pillow, J. Amato

Meeting Action: Mr. Galanes gave a progress report. SC Repairs and Alterations will address this item in accordance with NB15-2502. A task group was assigned to investigate the applicability of this item to the NBIC.

Item Number: NB15-2503	**NBIC Location: Part 3, Section 3**	**No Attachment**

General Description: Calculating Tube Expansion by Wall Thickness Reduction

Subgroup: Repairs and Alterations

Task Group: F. Johnson (PM), J. Sekely, W. Taylor

Meeting Action: Mr. Galanes gave a progress report. SC Repairs and Alterations will address this item in accordance with NB15-2502. A task group was assigned to investigate the applicability of this item to the NBIC.

Item Number: NB15-2801	**NBIC Location: Part 3, 4.2 b)**	**No Attachment**

General Description: Change reference standard, "ACCP-189" to "ANSI/ASNT CP-189" and also included reference to the ACCP Program.

Subgroup: Repairs and Alterations

Task Group: N. Carter (PM)

Meeting Action: Mr Galanes invited Mr. Nathan Carter to present on this item. Mr Carter presented about ASNT Central Certification Program (ACCP) and the rationale for removing the revision date from the text of the code. SC Repairs and Alterations sent this item to review and comment letter ballot.

Item Number: NB15-2802	**NBIC Location: Part 3, S6.10 b)**	**Attachment Pages 85-86**

General Description: Change reference standard, "ACCP-189" to "ANSI/ASNT CP-189" and also included reference to the ACCP Program.

Subgroup: Repairs and Alterations

Task Group: N. Carter (PM)

Meeting Action: Mr. Galanes invited Mr. Nathan Carter to present on this item. Mr. Carter presented a proposal for code change. SC Repairs and Alterations approved this item with a unanimous vote. Mr Carter explained that the change would clarify the current requirements in the text. This item was approved by a unanimous vote of the NBIC Committee.

At the conclusion of Mr. Galanes' report on NB15-2802, Mr. Randy Cauthon took a seat with the NBIC Committee as George Galanes' designated alternate. Also, Ms. Kathy Moore took a seat with the NBIC Committee as Jim Pillow's designated alternate.

d. Subcommittee on Pressure Relief Devices

Mr. Cook invited Subcommittee on Pressure Relief Devices Chair Mr. Sid Cammeresi to report on the activities of SC PRD. Mr. Cammeresi presented on the following:

i. Interpretations

Item Number: IN15-0301	**NBIC Location: Part 2, 2.5.8**	**Attachment Page 87**

General Description: Three interpretation questions regarding pressure relief device storage.

Subgroup: N/A

Task Group: None Assigned

History: None

Meeting Action: Mr. Cammeresi gave a report. SC PRD approved a response to the inquirer with a unanimous vote. The inquiry questions will remain unanswered, and an item will be opened to address the concerns of the commenter. The response was modified after discussion. The interpretation response was approved as modified by a unanimous vote of the NBIC Committee.

ii. Action Items – Old Business

Item Number: NB11-0401	**NBIC Location: TBD**	**No Attachment**

General Description: Investigate the development of a possible fourth part of the NBIC to cover pressure relief devices

Task Group: Unknown

Meeting Action: Mr. Cammeresi gave a progress report. Currently, a draft has been submitted to the SC PRD for comment and review letter ballot. The review and comment letter ballot will close at the end of the month. Then the item will be letter balloted to SC PRD for letter ballot vote. Then it will be sent to the other three subcommittees for review and comment letter ballot. National Board staff requests that a final approval at the NBIC Committee be completed by the January 2015 NBIC meeting.

Item Number: NB12-0901	**NBIC Location: Part 3**	**No Attachment**

General Description: Prepare a guide for repair of tank vents

Task Group: D. DeMichael (PM), K. Simmons, B. Donalson, B. Dobbins, K. Beise

Meeting Action: Mr. Cammeresi invited Mr. Kevin Simmons to report on this item. Mr Simmons reported on the history of the item. The task group is working with two manufacturers, and is seeking the participation of two more manufacturers to develop a proposal for code change.

Item Number: NB13-1901	**NBIC Location: TBD**	**No Attachment**

General Description: Add a provision to the NBIC to allow for the partial disassembly and cleaning of an ASME Section XII valve without changing the set pressure adjustments and without having to do a complete VR

Task Group: J. Ball (PM), R. McCaffrey, B. Nutter, T. Patel, D. McHugh

Meeting Action: Mr. Cammeresi invited Mr. Joe Ball to report on this item. Mr. Ball explained the use of these valves in ASME Section XII applications. More research is being performed to determine if partial disassembly is feasible to introduce to the NBIC for these valves.

Item Number: NB14-0602A	**NBIC Location: Part 1**	**No Attachment**

General Description: Improve index in Part 1 relating to pressure relief devices

Task Group: B. Anthony (PM), M. Broedeur, S. Cammeresi

Meeting Action: Mr. Cammeresi reported that this item has been put on hold until work on Part 4 is completed.

Item Number: NB14-0602B	NBIC Location: Part 2	No Attachment

General Description: Improve index in Part 2 relating to pressure relief devices

Task Group: D. DeMichael, B. Dobbins, B. Donalson

Meeting Action: Mr. Cammeresi reported that this item has been put on hold until work on Part 4 is completed.

Item Number: NB14-0602C	NBIC Location: Part 3	No Attachment

General Description: Improve index in Part 3 relating to pressure relief devices

Task Group: B. Nutter (PM), R. McCaffrey, T. Patel, K. Simmons

Meeting Action: Mr. Cammeresi reported that this item has been put on hold until work on Part 4 is completed.

Item Number: NB14-0603	NBIC Location: Part 3, 1.7.5.4 i), 4.5	No Attachment

General Description: Review record retention requirements for pressure relief devices

Task Group: B. Dobbins (PM), K. Beise, A. Renaldo

Meeting Action: Mr. Cammeresi invited Mr. Adam Renaldo to report on this item. Mr. Renaldo reported that no progress has been made since the last meeting.

Item Number: NB15-0103	NBIC Location: Part 1, 2.9.6 c)	No Attachment

General Description: Update requirements for power boiler pressure relief valve mounting and discharge

Task Group: None assigned

Meeting Action: Mr. Cammeresi gave a progress report. A task group and project manager was assigned, and a report will be given at the next meeting.

Item Number: NB15-0301	NBIC Location: Part 3, 4.5.2	No Attachment

General Description: Evaluate backpressure testing requirement for owner/users

Task Group: A. Cox (PM), T. Tarbay, D. DeMichael, B. Dobbins

Meeting Action: Mr. Cammeresi reported that a proposal was developed for this item, but the SC PRD rejected the proposal. A revision will be made to the proposal, and presented at the January 2016 meeting.

Item Number: NB15-0302	NBIC Location: Part 3, 5.12.3 d)	Attachment Page 88

General Description: Review blowdown requirements

Task Group: B. Donalson (PM), T. Patel

Meeting Action: Mr. Cammeresi presented a proposal for a code change. SC PRD approved this item with a unanimous vote. This item was approved by a unanimous vote of the NBIC Committee.

Item Number: NB15-0303	NBIC Location: Part 1, 4.5.1 and 5.3.1	Attachment Pages 89-90

General Description: Evaluate wording for capacity certification for resistance to flow

Task Group: B. Nutter (PM), K. Simmons

Meeting Action: Mr. Cammeresi invited Mr. Kevin Simmons to present on this item. Mr. Simmons presented a proposal for a code change. SC PRD approved this item with a unanimous vote. Discussion was held about the difference between flow certification and capacity certification for pressure relief devices. This item was approved by a unanimous vote of the NBIC Committee.

Item Number: NB15-0304	**NBIC Location: Part 3, 5.12.3**	**No Attachment**

General Description: Review verification of manufacturer's nameplate information

Task Group: B. Nutter (PM), S. Irvin, D. McHugh

Meeting Action: Mr. Cammeresi gave a progress report. A proposal was presented to SC PRD, but was withdrawn during discussion for further work.

Item Number: NB15-0305	**NBIC Location: Part 1**	**No Attachment**

General Description: Create Guidelines for Installation of Overpressure Protection by System Design.

Task Group: B. Dobbins (PM), B. Nutter, A. Renaldo, D. Marek

Meeting Action: Mr. Cammeresi reported no progress.

Item Number: NB15-0306	**NBIC Location: Part 1, 2.9.2**	**Attachment Pages 91-92**

General Description: Use of Pilot Operated Valves with Forced Flow Steam Generators.

Task Group: K. Simmons (PM), T. Patel

Meeting Action: Mr. Cammeresi presented a proposal for code change. SC PRD approved this item with a unanimous vote. This item was approved with a unanimous vote of the NBIC Committee.

Item Number: NB15-0307	**NBIC Location: Part 3**	**No Attachment**

General Description: Create Guidelines for Repair of Pin Devices.

Task Group: D. McHugh (PM), J. Satterthwaite

Meeting Action: Mr. Cammeresi reported on task group work. The task group gathered maintenance requirement from various manufacturers. A proposal should be ready for the January 2016 NBIC meeting.

Item Number: NB15-0308	**NBIC Location: Part 1**	**No Attachment**

General Description: Create Guidelines for Installation of Pressure Relief Devices for Organic Fluid Vaporizers.

Task Group: T. Patel (PM), K. Beise, B. Dobbins, B. Nutter

Meeting Action: Mr. Cammeresi gave a progress report. Brandon Nutter was added to the task group. No progress was reported.

Item Number: NB15-0310	**NBIC Location: Part 3, 1.7.5.4**	**No Attachment**

General Description: Give Guidance as to Which Spring Chart Should be used in Repairs.

Task Group: A. Cox (PM), B. Nutter, M. Brodeur, T. Patel, K. Simmons, R. McCaffrey

Meeting Action: Mr. Cammeresi invited Mr. Kevin Simmons to report on this item. Mr. Simmons reported on the history of the item, and that work continues on developing a proposal for code change.

Item Number: NB15-0311 NBIC Location: Part 1, 4.5.4 b) Attachment Page 93

General Description: - Clarify Text for Fire Condition PRV Installation Requirements.

Task Group: B. Nutter (PM), K. Beise, D. Marek

Meeting Action: Mr. Cammeresi presented a proposal for code change for this item. SC PRD approved this item with a unanimous vote. Mr Cammeresi explained that this new requirement matches requirements in ASME Section VIII. This item was approved by a unanimous vote of the NBIC Committtee.

Item Number: NB15-0312 NBIC Location: Part 2, 2.57 and 2.5.8 No Attachment

General Description: Re-evaluate T&P Valve Inspection Requirements Based on Robert Boiko Presentation.

Task Group: B. Dobbins (PM), R. Boiko, B. Anthony, J. Ball, A. Cox, A. Renaldo

Meeting Action: Mr. Cammeresi invited Mr. Joe Ball to present on this item. Mr. Ball summarized presentation by Mr. Robert Boiko. The task group is continuing to work on developing a proposal for code change.

Item Number: NB15-0313 NBIC Location: Part 1, 3.9.4.7 Attachment Page 94

General Description: Clarify Text to Better Define Valve Outlet Area.

Task Group: T. Patel (PM), D. Marek

Meeting Action: Mr. Cammeresi presented a proposal for code change. SC PRD approved this item with a unanimous vote. Ms. Melissa Wadkinson asked a question about how this proposal aligns with requirements in ASME Section IV. This item will be sent to SC Installation for review and comment. Then, it will be sent to the NBIC Committee for letter ballot. This course of action was approved by a unanimous vote of the NBIC Committee.

Item Number: NB15-0314 NBIC Location: Part 1, 3.9.4.2 No Attachment

General Description: Review of Y-Base or Valve less Headers for Use in T&P Valve Installations.

Task Group: B. Dobbins (PM), D. McHugh

Meeting Action: Mr. Cammeresi reported that no action has been taken.

Item Number: NB15-0315 NBIC Location: Part 1, 4.5.6 and 5.3.6 No Attachment

General Description: Review isolation Valve Requirements.

Task Group: D. DeMichael (PM), B. Nutter, A. Renaldo

Meeting Action: Mr. Cammeresi invited Mr. Adam Renaldo to report on this item. A proposal was

presented to SC PRD, but the proposal was rejected. Task group work will continue to address the concerns presented in SC PRD.

Item Number: NB15-0317	NBIC Location: Part 1, 5.3.1 a)	Attachment Page 95

General Description: Capacity certification for pressure relief devices in piping systems – currently in conflict with B31.3.

Task Group: K. Beise (PM), D. Marek, D. Gonzales

Meeting Action: Mr. Cammeresi presented a proposal for code change for this item. SC PRD approved this item with a unanimous vote. Mr. Stanley Staniszewski asked how this item applies to other work on covered piping systems. These concerns were addressed by Mr. Cook and Mr. Cammeresi. This item was approved by a unanimous vote of the NBIC Committee.

Item Number: NB15-0320	NBIC Location: Part 2, 2.5.5.3 g) 9)	Attachment Pages 96-97

General Description: Review torqued flanged rupture disk requirements

Task Group: B. Nutter (PM)

Meeting Action: Mr. Cammeresi presented a proposal for code change for this item. SC PRD approved this item with a unanimous vote. Discussion about the specific language of the proposal was held relating to visual replacement and rupture disk replacement. The proposal was modified in the course of the discussion. This item was approved as modified by a unanimous vote of the NBIC Committee.

Item Number: NB15-0321	NBIC Location: Part 2, 2.5.7 a)	No Attachment

General Description: Review testing requirements for inservice testing of pressure relief devices

Task Group: A. Cox (PM), A. Renaldo, J. Satterthwaite

Meeting Action: Mr Cammeresi invited Mr. Adam Renaldo to report on this item. Draft edits were proposed at SC PRD, but were rejected. Task group work will continue to address the comments from SC PRD.

Item Number: NB15-1004	NBIC Location: All	No Attachment

General Description: Update "stamp" vs. "certification" language to maintain consistency with ASME code

Task Group: B. Nutter (PM), T. Beirne

Meeting Action: Mr. Cammeresi gave a progress report. A task group has been formed to work on this item.

Item Number: NB15-2401	NBIC Location: Part 3, 4.5.2	No Attachment

General Description: Steam set on air by non owner-user.

Task Group: R. Donalson (PM), T. Patel

Meeting Action: Mr. Cammeresi gave a progress report. A task group has been formed to work on this item.

iii. Action Items – New Business

Item Number: NB15-0322	NBIC Location: Part 3, S7	Attachment Pages 98-100
General Description: Incorrect paragraph reference **Task Group:** None assigned **Meeting Action:** Mr. Cammeresi presented a proposal for code change. SC PRD approved this item with a unanimous vote. This item was approved by a unanimous vote of the NBIC Committee.		

Item Number: NB15-0323	NBIC Location: Part 3, S7	Attachment Page 101
General Description: Define Certificate of Compliance **Task Group:** None assigned **Meeting Action:** Mr. Cammeresi presented a proposal for code change. SC PRD approved this item with a unanimous vote. This item was approved by a unanimous vote of the NBIC Committee.		

Item Number: NB15-0324	NBIC Location: Part 2	No Attachment
General Description: Based on IN15-0301; the Sub-Committee on Pressure Relief Devices recognizes a need to create guidelines for storage and shelf life with respect to inspection and testing frequencies. **Task Group:** A. Renaldo (PM), B. Nutter, K. Simmons, D. Marek **Meeting Action:** Mr. Cammeresi gave a progress report. He reported that this item was opened in response to the interpretation request IN15-0301. A task group was formed to work on this item.		

8. Liaison Activities

a. American Society of Mechanical Engineers BPV Code (ASME BPV)

Mr. Don Cook presented slides prepared by Mr. Paul Edwards because Mr. Paul Edwards was not present. The slides are attached. (Attachment Pages 102-103)

b. American Welding Society (AWS)

Mr. Jim Sekely presented on current events in AWS. Major points of discussion are provided in the attached document. (Attachment Page 104)

c. American Petroleum Institute (API)

Mr. Jim Riley presented on current standards development in API. A chart of API standards in development or being updated is attached. (Attachment Pages 105-106)

d. American Society of Mechanical Engineers PCC Code (ASME PCC)

Mr. Scribner stated there is nothing to report on ASME PCC liaison activities.

9. New Business

Mr. Besserman presented a proposed change to the NB-240, *National Board Inspection Code Procedures*. The proposed change was approved by a unanimous vote of the NBIC Committee. (Attachment Page 107)

10. Future Meetings

Mr. Cook gave a report on future meetings. The following meetings are currently scheduled:

January 11-14, 2016 – Corpus Christi, Texas
July 18-21, 2016 – Columbus, Ohio

Mr. Cook requested all NBIC Committee members plan to stay until 5 pm on Thursdays for future NBIC meetings to allow the completion of all meeting business.

Mr. Cook presented options for the location of the January 2017 NBIC meeting. The options presented were Nashville, San Antonio, and San Diego. An informal vote of the NBIC Committee was taken with Nashville receiving seven votes, San Antonio receiving six votes, and San Diego receiving ten votes. The final location of the NBIC meetings is chosen at the discretion of National Board staff, taking into account the recommendation of the NBIC Committee.

11. Adjournment

Mr. Cook adjourned the meeting 3:51pm on July 16, 2015.

Respectfully submitted,

Brad Besserman
NBIC Secretary

NBIC Committee Attendance Sheet - 7/16/15

Name	Company	Phone Number	Email	Signature
Donald Cook	State of CA	510 622-3050	dcook@dir.ca.gov	Don Cook
Robert Wielgoszinski	HSB GS	860 722 5064	ROBERT_WIELGOSZINSKI@HSBCT.COM	R Wielgoszinski
Brad Besserman	NB	614-888-8320	bbesserman@nationalboard.org	B Besserman
Benjamin Anthony	State of RI	401-714-3701	BEN.ANTHONY@DLT.RI.GOV	B Anthony
Paul Bourgeois	ARISE	732-943 6078	PCBourge@GMAIL.COM	Paul Bourgeois
Sid Cammeresi	FURMANITE	(409) 392-0271	SIDNEYCAMMERESI@HOTMAIL.COM	S Cammeresi
Domenic Canonico	*			
Paul Edwards	CBI STONE & WEBSTER	617 589-5690	PAUL.EDWARDS@CBI.COM	Paul D. Edwards
George Galanes	DTS, Inc	630-799-8162	ggalanes@diamondtechnicalservices.com	G Galanes
Craig Hopkins				
Larry McManamon				
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Venus Newton	ONE CIS	678-457-1310	Venus.newton@onecis.com	V Newton
Ralph Pate				
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Ron Pulliam	B&W	330-388-9631	RLPULLIAM@BABCOCK.COM	R Pulliam
Mike Richards	Southern Company	205 992-7111	HMRICHAR@SOUTHERNCO.COM	M Richards
Jim Riley	Phillips 66	510-245-5895	Jim.Riley@P66.com	J Riley
Bryan Schulte	NRG Energy	713-203-4296	Bryan.Schulte@nrg.com	B Schulte
* Angelo Bramucci	Alstom	860-285-9176	angelo.c.bramucci@Power.alstom.com	A Bramucci

Name	Company	Phone	email	signature
James Sekely	NCPWB	412 389 5567	JSekely@Comcast.Net	
Kevin Simmons	Penfain V&C	832-454-9714	Kevin.simmons@penfain.com	
Stanley Stanlszewski	US DOT			
Rob Troutt	Texas	512-638-2727	Rob.Troutt@TDLR.texas.gov	
Michael Webb	Xcel Energy	303) 628-2890	mike.webb@xcelenergy.com	
[redacted]				
Jodi Metzmaier	NBBI	614-888-8320	jmetzmai@nationalboard.org	
Tom Beirne	NBBI	614-431-3239	tbeirne@nationalboard.org	
Ben Schaefer	AEP	614-716-1843	bschaefer@aep.com	
Randy Cauthon	ALSTOM POWER	860-285-3481	randal.t.cauthon@alstom.com	
Kathy Moore	Joe Moore Co	919-832-1665	kathy.moore@joemooreco.com	
Joseph Ball	NAT. BRD		jball@nationalboard.org	
ADAM RENALDO	PRAXAIR			
Monte Bost	HSB Global Stnds	937 620 3676	monte_bost@hsbct.com	
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JAMIE WALKER	HAYES MECHANICAL	773. 910.5892	JWALKER@HAYESMECHANICAL.COM	
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Brian Moore	HSB	860 722-5657	brian_moore@hsb.com	
TIM BARKER	FM GLOBAL	320 801 3790	TIMOTHY.BARKER@FMGLOBAL.COM	
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Charles Worthen	NB	614 888 8320	cworthen@nationalboard.org	
Brian Lester	Graycor Services	708 941 3016	brian_lester@graycor.com	

David Martinez	FM Global	703-262-6311	david.martinez@fmglobal.com	David Martinez
Melissa Wadkinson	Fulton	(315) 382-8481	melissa.wadkinson@fulton.com	
DONALD PATTEN	BAY CITY BOILER	(510) 786-3711	dpatten@bayCityBoiler.com	
WAYNE JONES	ARISE	251 895.8826	WAYNE.JONES@ARISEINC.COM	
DARRELL GRAF	AIR PRODUCTS & CHEMICALS INC.	601-569-0534	GRAFDR@AIRPRODUCTS.com	
GARY SCRIBNER	NBBI		GScribner@NationalBoard	
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DAN MAREK	MAINTHIA TECHNOLOGIES	216-433 5494	DANIEL.T.MAREK@NASA.GOV	
Frank Johnson	PBFENERGY	419-386-8450	Frank.Johnson@PBFEnergy.com	
JACK M. GIVEN	RETIRED	919-424-6978	JGivenjr@nc.rr.com	
Bonnie Petersen	MWU LLC	715-339-2191	bonnie.petersen@marquipwardunited.com	
Paul Wellek	ARISE	678 446 5290	paul.wellek@ariseinc.com	
Bill Wallace	NB STAFF		bWallace@nationalBd.org	

DAVID W. FORD

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Holly Springs, NC 27540
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Experience

USDOT/Federal Motor Carrier Safety Administration

November 2009 to Present — Hazardous Materials Program Manager, Southern Service Center
Manager hazardous materials enforcement program for the 11 states in the Southeastern United States.

March 2008 to November 2009 — State Program Manager, Michigan Division
Manage grants given to the State of Michigan related to commercial vehicle enforcement.

Michigan State Police Motor Carrier Division

January 2004 to March 2008 — M.C. Lieutenant 14
Commander of Special Programs Section. Responsible for numerous state wide programs, including: Investigation Unit, Hazardous Materials Unit, Safety Audit Unit, Bus Inspection Unit, Recruiting Unit, and Data Processing Unit. Also act as Division training coordinator, Division Public Information Officer, and Division Legislative Liaison and manage all Division state and federal grants.

June, 2000 to January 2004 — M.C. Lieutenant 14
Commander of Field Support Section.

March, 1993 to June, 2000 — M.C. Investigator Sergeant
Commander of Hazardous Materials Unit.

April, 1992 to March, 1993 — Sergeant, Grass Lake Scales
Direct supervision of Grass Lake and Cambridge personnel.

Oct., 1992 to Dec., 1992 — Acting Commander of Fourth District
Second Line supervisor of three weigh stations and 20 officers.

1985-1992 — Motor Carrier Officer, Road patrol and Scales, Battle Creek and Jackson Posts.

DAVID W. FORD

Education

June, 1998 — Leadership and Management Program - Central Michigan University
Leadership, Strategic Planning, Decision Analysis, Financial Management, Project Management

May, 1984 — Bachelor of Science Degree - Lake Superior State University
Conservation Law Enforcement/Criminal Justice
Cum Laude, 3.55/4.0
President, Criminal Justice Association, 1982-83, 1983-84
Member, *Alpha Phi Sigma,* National Criminal Justice Honor Society, LSSU Chapter

May, 1982 — Associate Degree- Lake Superior State University
Natural Resources Technology

Additional Training

√ State Certified Michigan Professional Emergency Manager (PEM, 1997-2000).

√ Numerous Management courses, including:
Team Building, Supervisory and Management, Presentations, and Media Relations

√ Numerous Hazardous Materials Response and Transportation Regulations courses, including:
OSHA/Operations Level Emergency Responder
Awareness/Operations Instructor
Incident Command System
CVSA General Hazardous Materials Course
CVSA Bulk Package/Cargo Tank Courses
CVSA Enhanced Inspection of Radioactive Materials Course
Instructor, Cargo Tank Facility Review Course
Instructor, NTTC Cargo Tank Workshops

Association Affiliations

√ Commercial Vehicle Safety Alliance (CVSA)
1996-2000, Chair, Hazardous Materials Committee
1995-1996, Vice-Chair, Hazardous Materials Committee
1993-1995, Member, Hazardous Materials Committee

Awards

2002 Michigan State Police Professional Excellence Award
2000 CVSA Presidents Award
1996 First Annual Motor Carrier Division Leadership Award
1991 Michigan State Police Meritorious Service Award

PROPOSED INTERPRETATION

Inquiry No.	IN15-0501				
Source	Michael Nelson – City of Albuquerque, Boiler Inspector				
Subject	Part 1, 3.8.2.3				
Edition	2013 Edition				
Question	Question 1: In the case of a hot-water supply boiler and storage tank, is it permissible to place the operating limit on the storage tank?				
Reply	A1: Yes				
Committee's Question	Is it permissible to place the operating temperature control on a storage tank located in a hot water supply system?				
Committee's Reply	Yes				
Rationale	Not prohibited by the NBIC. See Part 1 Section 3.8.2.3 a)				
SC Vote	Unanimous X	No. Affirmative	No. Negative	No. Abstain	No. Not Voting
NBIC Vote	Unanimous	No. Affirmative	No. Negative	No. Abstain	No. Not Voting
Negative Vote Comments					

3.8.2.3 TEMPERATURE CONTROL

Each automatically fired hot-water heating or hot-water supply boiler shall be protected from over-temperature by two temperature-operated controls.

a) Each individual hot-water heating or hot-water supply boiler or each system of commonly connected boilers shall have a control that will cut off the fuel supply when the water temperature reaches an operating limit, which shall be less than the maximum allowable temperature.

b) In addition to a) above, each individual automatically fired hot-water heating or hot-water supply boiler shall have a safety limit control with manual reset that will cut off the fuel supply to prevent the water temperature from exceeding the maximum allowable temperature at the boiler outlet.

3.8.2.4 LOW-WATER FUEL CUTOFF

a) Each automatically fired hot-water boiler shall have an automatic low-water fuel cutoff with manual reset. The low-water fuel cutoff shall be designed for hot-water service, and it shall be so located as to automatically cut off the fuel supply when the surface of the water falls to the level established in b) below.

b) As there is no normal waterline to be maintained in a hot-water boiler, any location of the low-water fuel cutoff above the lowest safe permissible water level established by the boiler manufacturer is satisfactory.

c) In lieu of the requirements for low-water fuel cutoffs in paragraph a), boilers requiring forced circulation to prevent overheating of the tubes, coils, or vessel, shall have an accepted flow, and/or temperature-sensing device to prevent burner operation at a flow rate inadequate to protect the boiler unit against overheating at all allowable firing rates. This safety control(s) shall shut down the burner and prevent restarting until an adequate flow is restored and shall be independent of all other controls.

d) A means shall be provided for testing the operation of the external low-water fuel cutoff without resorting to draining the entire system. Such means shall not render the device inoperable except as follows. If the means temporarily isolates the device from the boiler during this testing, it shall automatically return to its normal position. The connection may be so arranged that the device cannot be shut off from the boiler except by a cock placed at the device and provided with a tee or lever-handle arranged to be parallel to the pipe in which it is located when the cock is open.

3.8.2.5 MODULAR HOT-WATER HEATING BOILERS

a) Each module of a modular hot-water heating boiler shall be equipped with:

1) Pressure/altitude gage, see NBIC Part 1, 3.8.2.1;

2) Thermometer, see NBIC Part 1, 3.8.2.2; and

3) Temperature control, see NBIC Part 1, 3.8.2.3 a).

b) The assembled modular hot-water heating boiler shall be equipped with:

1) Temperature control, see NBIC Part 1, 3.8.2.3 b); and

2) Low-water fuel cutoff, see NBIC Part 1, 3.8.2.4.

PART 1, SECTION 6

SPECIAL REQUIREMENTS FOR THE INSTALLATION OF CONDENSING BOILERS

S6.1 SCOPE

a) NBIC Part 1 Section 6 Supplement 6 provides requirements for various aspects of the installation of Condensing Boilers which are unique from other products covered by this section.

b) This supplement is intended for the Owner/User/Installer only, and is based on Local, State or National Building Codes requiring the installation of a Carbon Monoxide (CO) detector/alarm in the boiler room.

S6.2 DETERMINATION OF ALLOWABLE OPERATING PARAMETERS

The allowable operating parameters of the combustion air intake and the exhaust gas venting shall be in accordance with jurisdictional, environmental and manufacturers recommendations, as applicable.

S6.3 GENERAL REQUIREMENTS

Condensing boilers shall meet all the requirements of NBIC Part 1, Section 3 and this Supplement.

S6.4 FLUE GAS VENTING SYSTEM PIPING REQUIREMENTS

a) The vent piping shall be corrosion resistant and fabricated from either stainless alloy or plastic material as defined by the boiler manufacturer and certified for the application.

b) The diameter of the vent piping shall be as defined by the boiler manufacturer and shall not be reduced, except as allowed by the boiler manufacturer.

c) The “Total Equivalent Length” of the vent piping, and the pressure drop through the vent piping, shall not exceed that stated in the Boiler Manufacturer’s Installation Manual. (Note Equivalent Length includes the pressure loss effect of various pipe fittings, such as elbows, etc.) Horizontal pipe runs shall slope toward the boiler and the condensate collection point.

d) The termination point of the vent piping shall be positioned such that there is no possibility of vented flue gas being entrained in the combustion air intake, as defined by the manufacturer. Additionally the vent termination shall be located above the highest known snowline for the location involved, and be designed in such a manner, so as to prevent freezing.

S6.5 SEALED COMBUSTION SYSTEM REQUIREMENTS

a) The location of the outside air intake, relative to the flue gas vent, shall be such that there shall be no cross contamination with products of combustion or other airborne corrosive or hazardous contaminants, as defined by the manufacturer. Additionally the location of the combustion air intake shall be above the highest known snowline for the location involved.

b) The diameter, length and routing of the combustion air intake piping shall be such that the pressure drop though the system, including any filters, shall not exceed the maximum pressure drop stated by the boiler/burner manufacturer.

S6.6 CONDENSATE DRAIN SYSTEM REQUIREMENTS

The flue gas condensate from an individual boiler shall be collected at a single point, and the routing of the drain piping shall include the following features:

1) A water trap, the height of which cannot be varied by field manipulation, and is in accordance with boiler manufacturers requirements.

2) A visible means of ensuring that the condensate water trap contains the correct water level.

3) A discharge point away from occupied areas.

4) A method of controlling the pH of the condensate prior to its discharge into a sewer system, if required by local building Codes.

Action Item Request Form

8.3 CODE REVISIONS OR ADDITIONS

Request for Code revisions or additions shall provide the following:

a) Proposed Revisions or Additions

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

Existing Text

2.5.1.3 PUMPS

a) Boiler feedwater pumps shall have discharge pressure in excess of the maximum allowable working pressure (MAWP) in order to compensate for frictional losses, entrance losses, regulating valve losses, and normal static head, etc. Each source of feedwater shall be capable of supplying feedwater to the boiler at a minimum pressure of 3% higher than the highest setting of any safety valve on the boiler plus the expected pressure drop across the boiler. The following table is a guideline for estimating feed pump differential:

TABLE 2.5.1.3
GUIDE FOR FEEDWATER PUMP DIFFERENTIAL

Boiler Pressure		Boiler Feedwater Pump Discharge Pressure	
psig	(MPa)	psig	(MPa)
200	(1.38)	250	(1.72)
400	(2.76)	475	(3.28)
800	(5.52)	925	(6.38)
1,200	(8.27)	1,350	(9.31)

b) Statement of Need

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

Add to the last sentence of Part 1. Pumps 2.5.1.3 a)

2.5.1.3 PUMPS

a) Boiler feedwater pumps shall have discharge pressure in excess of the maximum allowable working pressure (MAWP) in order to compensate for frictional losses, entrance losses, regulating valve losses, and normal static head, etc. Each source of feedwater shall be capable of supplying feedwater to the boiler at a minimum pressure of 3% higher than the highest setting of any safety valve on the boiler plus the expected pressure drop across the boiler. Detailed engineering evaluation of the pump selection shall be performed. The following table is a guideline for estimating feedwater pump differential**:**

c) Background Information

Provide background information to support the revision or addition, including any data or changes in technology that form the basis for the request that will allow the Committee to adequately evaluate the proposed revision or addition. Sketches, tables, figures, and graphs should be submitted as appropriate.

When applicable, identify any pertinent paragraph in the Code that would be affected by the revision or addition and identify paragraphs in the Code that reference the paragraphs that are to be revised or added.

d) TG Assigned

Project Manager:	Don Patten
Members:	Stan Konopacki and Ed Wiggins

2.5 SOURCE REQUIREMENTS

2.5.1 FEEDWATER

2.5.1.1 VOLUME

The source of feedwater shall be capable of supplying a sufficient volume of water as determined by the boiler manufacturer in order to prevent damage to the boiler when all the safety relief valves are discharging at full capacity.

2.5.1.2 CONNECTION

a) To prevent thermal shock, feedwater shall be introduced into a boiler in such a manner that the water will not be discharged directly against surfaces exposed to high temperature gases or to direct radiation from the flame.

b) For boiler operating pressures of 400 psig (2.8 MPa) or higher, the feedwater inlet through the drum shall be fitted with shields, sleeves, or other suitable means to reduce the effects of temperature differentials in the shell or head.

c) Feedwater other than condensate return shall not be introduced through the blowoff.

d) Boilers having more than 500 sq. ft. (46.5 sq. m) of water heating surface shall have at least two means of supplying feedwater. For boilers that are fired with solid fuel not in suspension, and boilers whose setting or heat source can continue to supply sufficient heat to cause damage to the boiler if the feedwater supply is interrupted, one such means of supplying feedwater shall not be subject to the same interruption as the first method. Boilers fired by gaseous, liquid, or solid fuel in suspension may be equipped with a single means of supplying feedwater, provided means are furnished for the immediate removal of heat input if the supply of feedwater is interrupted.

e) For boilers having a water heating surface of not more than 100 sq. ft. (9 sq. m), the feedwater piping and connection to the boiler shall not be smaller than NPS 1/2 (DN 15). For boilers having a water heating surface more than 100 sq. ft. (9 sq. m), the feedwater piping and connection to the boiler shall not be less than NPS 3/4 (DN 20).

f) Electric boiler feedwater connections shall not be smaller than NPS 1/2 (DN 15).

g) High-temperature water boilers shall be provided with means of adding water to the boiler or system while under pressure.

2.5.1.3 PUMPS

a) Boiler feedwater pumps shall have discharge pressure in excess of the maximum allowable working pressure (MAWP) in order to compensate for frictional losses, entrance losses, regulating valve losses, and normal static head, etc. Each source of feedwater shall be capable of supplying feedwater to the boiler at a minimum pressure of 3% higher than the highest setting of any safety valve on the boiler plus the expected pressure drop across the boiler. The following table is a guideline for estimating feedwater pump differential: (15)

TABLE 2.5.1.3
GUIDE FOR FEEDWATER PUMP DIFFERENTIAL

(15)

Boiler Pressure		Boiler Feedwater Pump Discharge Pressure	
psig	(MPa)	psig	(MPa)
200	(1.38)	250	(1.72)
400	(2.76)	475	(3.28)
800	(5.52)	925	(6.38)
1,200	(8.27)	1,350	(9.31)

b) For forced-flow steam generators with no fixed steam or water line, each source of feedwater shall be capable of supplying feedwater to the boiler at a minimum pressure equal to the expected maximum sustained pressure at the boiler inlet corresponding to operation at maximum designed steaming capacity with maximum allowable pressure at the superheater outlet.

c) Control devices may be installed on feedwater piping to protect the pump against overpressure.

2.5.1.4 VALVES

a) The feedwater piping shall be provided with a check valve and a stop valve. The stop valve shall be located between the check valve and the boiler.

b) When two or more boilers are fed from a common source, there shall also be a globe or regulating valve on the branch to each boiler located between the check valve and the feedwater source.

c) When the feedwater piping is divided into branch connections and all such connections are equipped with stop and check valves, the stop and check valve in the common source may be omitted.

d) On single boiler-turbine unit installations, the boiler feedwater stop valve may be located upstream from the boiler feedwater check valve.

e) If a boiler is equipped with duplicate feedwater supply arrangements, each such arrangement shall be equipped as required by these rules.

f) A check valve shall not be a substitute for a stop valve.

g) A combination feedwater stop-and-check valve in which there is only one seat and disk and a valve stem is provided to close the valve when the stem is screwed down shall be considered only as a stop valve, a separate check valve shall be installed.

h) Whenever globe valves are used on feedwater piping, the inlet shall be under the disk of the valve.

i) Stop valves and check valves shall be placed on the inlet of economizers or feedwater-heating devices.

j) The recirculating return line for a high-temperature water boiler shall be provided with the stop valve, or valves, required for the main discharge outlet on the boiler.

2.5.2 FUEL

Fuel systems, whether firing coal, oil, gas, or other substance, shall be installed in accordance with jurisdictional and environmental requirements, manufacturer's recommendations, and/or industry standards, as applicable.

Part 1, 2.5.1.3 – Remove "the expected pressure drop across the boiler"

The second sentence in the paragraph 2.5.1.3 a) states that "Each source of feedwater shall be capable of supplying feedwater to the boiler at a minimum pressure of 3% higher than the highest setting of any safety valve on the boiler *plus the expected pressure drop across the boiler*." For a natural circulation boiler there really isn't any pressure drop across the boiler per se. Perhaps a more relevant factor is the pressure drop in the feedwater piping between the boiler feed pump and the boiler. However, the feedwater piping pressure drop is already addressed by the fact that the 3% over pressure is required to be supplied to the boiler.

Section I PG-61.1 has a similar requirement for the 3% overpressure, but without additional the words regarding pressure drop across the boiler. In order to be consistent with Section I, I am submitting the request for revision on the following page for consideration by the Committee.

Response:

PG-61.1: Addresses feedwater supply at the boiler.

Part 1, 2.5.1.3: Addresses pumps which include system losses beyond the boiler and feedwater supply throughout the entire system.

Proposal:

2.5.1.3 PUMPS

a) Boiler feedwater pumps shall have discharge pressure in excess of the ~~maximum allowable working pressure (MAWP)~~ highest set pressure relief valve in order to compensate for frictional losses, entrance losses, regulating valve losses, and normal static head, etc. Each source ~~of feedwater~~ shall be capable of supplying feedwater to the boiler at a minimum pressure of 3% higher than the highest setting of any ~~safety~~ pressure relief valve on the boiler proper ~~plus the expected pressure drop across the boiler~~. Detailed engineering evaluation of the pump selection shall be performed. The following table is a guideline for estimating feedwater pump differential:

Rationale:

Per email from Peter Molvie - 1/28/15

Peter A. Molvie, P.E.
Manager, Codes & Standards
Cleaver-Brooks Product Development
3232 W. Lancaster Ave.

This fixes two problems. It corrects the inconsistency between the first sentence speaking in terms of pressure higher than MAWP and the second speaking of pressure in excess of the highest set safety valve. Secondly, it eliminates the counting of the piping pressure drop twice, making the words consistent with Section I. I have included the exact same words from Section I PG-61.1 as highlighted below.

PG-61 FEEDWATER SUPPLY

PG-61.1 Except as provided for in PG-61.2 and PG-61.4, boilers having more than 500 ft^2 (47 m^2) of water-heating surface shall have at least two means of feeding water. Except as provided for in PG-61.3, PG-61.4, and PG-61.5, each source of feeding shall be capable of supplying water to the boiler at a pressure of 3% higher than the highest setting of any pressure relief valve on the boiler proper. For boilers that are fired with solid fuel not in suspension, and for boilers whose setting or heat source can continue to supply sufficient heat to cause damage to the boiler if the feed supply is interrupted, one

~~Change wording to read: Boiler feedwater pumps shall have discharge pressure in excess of the boiler rated pressure (MAWP) in order to compensate for frictional losses, entrance losses, regulating valve losses, and normal static head, etc. Each source of feedwater shall be capable of supplying feedwater to the boiler at a minimum pressure of 3% higher than the highest setting of any safety valve on the boiler plus the expected pressure losses.drop across the boiler. The following table is a guideline for estimating feed pump differential:~~

2.5 SOURCE REQUIREMENTS

2.5.1 FEEDWATER

2.5.1.1 VOLUME

The source of feedwater shall be capable of supplying a sufficient volume of water as determined by the boiler manufacturer in order to prevent damage to the boiler when all the safety relief valves are discharging at full capacity.

2.5.1.2 CONNECTION

a) To prevent thermal shock, feedwater shall be introduced into a boiler in such a manner that the water will not be discharged directly against surfaces exposed to high temperature gases or to direct radiation from the flame.

b) For boiler operating pressures of 400 psig (2.8 MPa) or higher, the feedwater inlet through the drum shall be fitted with shields, sleeves, or other suitable means to reduce the effects of temperature differentials in the shell or head.

c) Feedwater other than condensate return shall not be introduced through the blowoff.

d) Boilers having more than 500 sq. ft. (46.5 sq. m) of water heating surface shall have at least two means of supplying feedwater. For boilers that are fired with solid fuel not in suspension, and boilers whose setting or heat source can continue to supply sufficient heat to cause damage to the boiler if the feedwater supply is interrupted, one such means of supplying feedwater shall not be subject to the same interruption as the first method. Boilers fired by gaseous, liquid, or solid fuel in suspension may be equipped with a single means of supplying feedwater, provided means are furnished for the immediate removal of heat input if the supply of feedwater is interrupted.

e) For boilers having a water heating surface of not more than 100 sq. ft. (9 sq. m), the feedwater piping and connection to the boiler shall not be smaller than NPS 1/2 (DN 15). For boilers having a water heating surface more than 100 sq. ft. (9 sq. m), the feedwater piping and connection to the boiler shall not be less than NPS 3/4 (DN 20).

f) Electric boiler feedwater connections shall not be smaller than NPS 1/2 (DN 15).

g) High-temperature water boilers shall be provided with means of adding water to the boiler or system while under pressure.

2.5.1.3 PUMPS

a) Boiler feedwater pumps shall have discharge pressure in excess of the maximum allowable working pressure (MAWP) in order to compensate for frictional losses, entrance losses, regulating valve losses, and normal static head, etc. Each source of feedwater shall be capable of supplying feedwater to the boiler at a minimum pressure of 3% higher than the highest setting of any safety valve on the boiler plus the expected pressure drop across the boiler. The following table is a guideline for estimating feedwater pump differential: (15)

TABLE 2.5.1.3
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800	(5.52)	925	(6.38)
1,200	(8.27)	1,350	(9.31)

b) For forced-flow steam generators with no fixed steam or water line, each source of feedwater shall be capable of supplying feedwater to the boiler at a minimum pressure equal to the expected maximum sustained pressure at the boiler inlet corresponding to operation at maximum designed steaming capacity with maximum allowable pressure at the superheater outlet.

c) Control devices may be installed on feedwater piping to protect the pump against overpressure.

2.5.1.4 VALVES

a) The feedwater piping shall be provided with a check valve and a stop valve. The stop valve shall be located between the check valve and the boiler.

b) When two or more boilers are fed from a common source, there shall also be a globe or regulating valve on the branch to each boiler located between the check valve and the feedwater source.

c) When the feedwater piping is divided into branch connections and all such connections are equipped with stop and check valves, the stop and check valve in the common source may be omitted.

d) On single boiler-turbine unit installations, the boiler feedwater stop valve may be located upstream from the boiler feedwater check valve.

e) If a boiler is equipped with duplicate feedwater supply arrangements, each such arrangement shall be equipped as required by these rules.

f) A check valve shall not be a substitute for a stop valve.

g) A combination feedwater stop-and-check valve in which there is only one seat and disk and a valve stem is provided to close the valve when the stem is screwed down shall be considered only as a stop valve, a separate check valve shall be installed.

h) Whenever globe valves are used on feedwater piping, the inlet shall be under the disk of the valve.

i) Stop valves and check valves shall be placed on the inlet of economizers or feedwater-heating devices.

j) The recirculating return line for a high-temperature water boiler shall be provided with the stop valve, or valves, required for the main discharge outlet on the boiler.

2.5.2 FUEL

Fuel systems, whether firing coal, oil, gas, or other substance, shall be installed in accordance with jurisdictional and environmental requirements, manufacturer's recommendations, and/or industry standards, as applicable.

2.8.4 PRESSURE CONTROL

Each automatically fired steam boiler shall be protected from overpressure by two pressure-operated controls.

a) Each individual steam boiler or each system of commonly connected steam boilers shall have a control that will cut off the fuel supply when the steam pressure reaches an operating limit, which shall be less than the maximum allowable pressure.

b) Each individual automatically fired steam boiler shall have a safety limit control, with a manual reset, that will cut off the fuel supply to prevent steam pressure from exceeding the maximum allowable working pressure of the boiler. Each control shall be constructed to prevent a pressure setting above the maximum allowable working pressure of the boiler.

c) Shutoff valves of any type shall not be placed in the steam pressure connection between the boiler and the controls described in a) and b) above. These controls shall be protected with a siphon or equivalent means of maintaining a water seal that will prevent steam from entering the control. The connections to the boiler shall not be less than NPS 1/4 (DN 8), but where steel or wrought iron pipe or tubing is used, they shall not be less than NPS 1/2 (DN 15). The minimum size of an external siphon shall be NPS ¼ (DN 8) or 3/8 in. (10 mm) outside diameter nonferrous tubing. For manifold connections, the minimum size shall be as specified in the original code of construction.

Subgroup Locomotives
National Board Item No. NB11-1805
Current Level: Subgroup moved to SC Inspection

NBIC Part 2 Paragraph(s): S1.4.2.9

Title: Staybolts
Date: Opened: April 2011

Background:
1) My reason for requesting these additions and changes was to add the values for the minimum allowable staybolt head thickness and minimum allowable staybolt head diameter of driven head staybolts.

2) The reasons we need to set these minimum values are:

A) Threaded staybolts do not have sufficient threads engaged in the firebox sheets to provide the threaded section sufficient strength to resist the operating loads by the length of thread engaged.

The normal rule used in mechanical engineering for the design of threaded fastener connections in ferrous material is for the minimum thread engagement length between the fastener and the part (the depth of the tapped hole into which the fastener threads and the length of the fastener threads that engage the tapped hole threads) to equal 1 x bolt diameter.

Therefore a 1" diameter staybolt requires 1" of thread engagement in the firebox sheet in order for the connection to rely only on the threads of both parts to provide the rated design strength.

However, the normal design of staybolted firebox used on our locomotive boilers does not enable this long threaded connection to be made. The reason for this is the firebox sheets usually are in the 3/8" - 1/2" thickness range. This limits the length of the threaded connection on flat surface to the sheet thickness.

The remaining strength of the threaded connection between the staybolt and the firebox sheet therefore is dependent on the design and condition of the threaded staybolt's driven head. The staybolt's driven head acts in the same manner as a standard nut applied to a standard bolt by providing to both the staybolt and the firebox plate additional strength. The additional strength is used to resist the action of the boiler pressure from forcing the firebox plate off of the staybolt. This applies to normal operation during overheating events up to the first transition temperature range when the strength of the staybolts and firebox plate is reduced.

B) The ASME B&PVC recognized the strength value of the different designs of driven head staybolts in both Section I and in Locomotive Boilers Section III. An example of this is shown on Part L-31 in the 1952 Edition of Locomotive Boilers Section III. In the formula the value "C" is used for the strength of the different size and types of staybolt heads.

3) I've given our Loco Sub-Group members copies of strength tests conducted by the Master Boiler Makers Association for different design staybolts heads. I can provide you and the rest of our group members another copy of this if you consider it useful. The test data shows that staybolts having smaller design driven heads have less resistance to being pulled out of the plate.

S1.4.2.9 STAYBOLTS
Staybolts shall be inspected for:
a) Cracks in or breakage of the body;
b) Erosion of the driven head from corrosion or combustion gases;
c) Staybolt head flush with or below the surface of the sheet;
d) Plugging of telltale holes except as permitted by 49 CFR Part 230.41;
e) Waterside corrosion;
f) Staybolt heads that have been covered over by welding; and
g) ~~Correct application of seal welding to Staybolt heads.~~

Notes: An indicator of waterside corrosion on threaded staybolts is the lack of threads on the section of the staybolt body ~~just above~~ adjacent to the sheet.

Broken staybolts may be detected by leakage through telltale holes and by hammer testing. Both methods are most effective when the boiler is under hydrostatic pressure of at least 95% MAWP.

If a hydrostatic test cannot be applied, the hammer test may be performed alone with the boiler drained.

When a broken staybolt is found, the staybolts adjacent to it should be examined closely because these may have become overstressed by addition of the load from the broken staybolt.

A telltale hole plugged by installation of a nail or pin may indicate the staybolt is broken and requires replacement.

A telltale hole plugged by refractory to prevent buildup of foreign matter in the telltale hole is permitted for locomotives operating under FRA Jurisdiction per 49 CFR Section 230.4.1.

One indication that a threaded staybolt leaks during service is when the head of it is found to have been re-driven repeatedly.

Voted by Subgroup: Passed Date: 3/25/2015

Supplement SX
Inspector Review Guidelines for Finite Element Analysis (FEA)

Revision date: July 15, 2015 ~~January 7, 2015~~ ~~July 14, 2014~~

NB 13-1301 FEA Task Group

PART 2, SECTION 4
INSPECTION – EXAMINATIONS, TEST METHODS, AND EVALUATIONS

4.6 QUANTITATIVE ENGINEERING ASSESSEMENTS INCLUDING FINITE ELEMENT ANALYSIS (FEA)

4.6.1 CALCULATIONS

This Section describes **criteria to be considered** ~~review~~ by the Inspector **in the review** of calculations prior to acceptance of quantitative engineering assessments per industry standards (such as fitness-for-service) for in-service equipment, ~~and~~ repairs and alterations.

4.6.~~1~~2 ENGINEER EXPERIENCE

For quantitative engineering **used ~~for~~in** assessments, repairs and alterations, all calculations shall be completed prior to the start of any physical work or fitness-for-service acceptance. All design calculations shall be completed by an engineer (as designated by the manufacturer, R-stamp organization, owner or user) experienced in the design portion of the ~~standard~~code used for construction of the item. Refer to NBIC Part 3, ~~Sections~~ Paragraphs 3.2.4, 3.2.5, and 3.2.6 for design and calculations requirements for repairs and alterations.

4.6.3~~1.2~~ FINITE ELEMENT ANALYSIS (FEA) ENGINEER EXPERIENCE

Finite Element Analysis (FEA) may be used to support quantitative engineering assessments or design for repairs and alterations as follows.

a) When quantitative engineering analysis is used to demonstrate the structural integrity of an in-service component containing a flaw or damage.

b) Where the configuration is not covered by the available rules in the ~~standard~~code used for construction.

c) When there are complicated loading conditions or when a thermal analysis is required.

Because the FEA method requires more extensive knowledge of, and experience with, pressure equipment design and the FEA software package involved, the analysis and report submitted to the Inspector for review shall be completed and certified by a Professional Engineer (PE) licensed and registered as required by the manufacturer, R-stamp organization, owner or user and the jurisdiction if applicable.

The Inspector may require an initial explanation of why the FEA is applicable before the analysis is performed. The ~~i~~Inspector ~~shall~~ should verify ~~that~~ the validity of the FEA report~~:~~, that it has been certified by a licensed and registered Professional Engineer~~:~~, and that it is available for review by the manufacturer, R-stamp organization, owner or user and the jurisdiction. Owing to the specialized nature of FEA, the report must be clear and concise. Further guidelines are found in NBIC Part 2 Sx. INSPECTOR REVIEW GUIDELINES FOR FINETE ELEMENT ANALYSIS (FEA).

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Supplement SX
Inspector Review Guidelines for Finite Element Analysis (FEA)

Revision date: July 15, 2015 ~~January 7, 2015~~ ~~July 14, 2014~~

SX.1 SCOPE

This Supplement provides guidelines to be followed when a finite element analysis (FEA) is submitted as part of a quantitative engineering assessment for in-service equipment, or a repair or alteration ~~package~~ for a pressure retaining item for review by the Inspector, and the ~~local~~ jurisdiction if required. Refer to NBIC Part 2, ~~Section~~ Paragraph 4.6.

SX.2 TERMINOLOGY

a) Finite element analysis (FEA) as applied in engineering is a computational tool for performing engineering analysis. It includes the use of mesh generation techniques for dividing a complex problem into small elements for simulation, as well as the use of software program coded with finite element method algorithms.

b) Quantitative engineering assessment refers to methodologies whereby flaws contained within a pressure retaining item are assessed in order to determine the adequacy of the structure for continued service without failure. The result of the assessment provides guidance on structural integrity, inspection methods and intervals, and shapes decisions to operate, repair, monitor or replace the structure/pressure retaining item.

SX.3 CHECKLIST

The following ~~presents~~is a ~~thought-provoking~~ checklist of areas to consider and discuss with the FEA practitioner engineer performing the analysis and may be used to familiarize the Inspector with the FEA approach and method~~- as part of validating the FEA report.and aid in preparing an analysis specification~~.

SX.3.1 PRESSURE RETAINING ITEM INFORMATION

a) Vessel type, size, region/section and component(s) under FEA consideration
b) Materials of construction and materials properties (including those as a function of temperature)
c) Original code of construction
d) Repair and alteration history
e) Known extent of degradation and associated damage mechanisms (if available/any)
f) Operating conditions (temperature and heat flux, pressure including vacuum, cyclical service, etc.)
g) Other loads (seismic, earthquake, etc.)

SX.3.2 SCOPE OF THE FEA

a) The objective of the FEA analysis (to be used to support quantitative engineering analysis, repair, alteration, etc.)
b) The justification for use of FEA rather than rules in the code of construction. Refer to NBIC PART 2 4.6.1.2

SX.3.3 FEA SOFTWARE AND MODELLING

a) The software version to be used for the analysis

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b) The type of analysis (~~i.e~~e.g.,. stress, static, dynamic, elastic, plastic, small or large deformations, heat transfer, etc.)
c) The modelling approach that will be used (e.g., solids, shells, simplification of geometry, mesh generation, solver technique, division into elements and element size, boundary restraints, etc.)
d) The geometries to be modeled (e.g., non-corroded, corroded and future corrosion allowance, bulge, dent, groove, crack, etc.)

SX.4 REPORT REQUIREMENTS

The following checklist of areas to consider and discuss with the FEA practitioner engineer completing the certified report may be used to define what should be included in the report. An alternate useful reference is the following presentation: Proceedings of the ASME 2014 Pressure Vessels & Piping Conference, PVP2014-28958, Writing and Reviewing FEA Reports Supporting ASME Section VIII, Division 1 and 2 Designs – Practical Considerations and Recommended Good Practice.

SX.4.1 SECTIONS TO BE INCLUDED IN THE REPORT

a) An introduction and/or executive summary
b) A description of the model
c) A presentation of the results
d) An analysis of the results and conclusions

SX.4.2 LISTING OF INFORMATION THAT MAY BE INCLUDED IN THE FEA REPORT

SX.4.2.1 ANALYSIS METHOD

a) State the scope of the FEA and the justification for using it; give the program and version
b) Note whether or not the problem is linear.
c) Give an overview of how the analysis is conducted, for example:
   1) Calculations are done to simplify radiation boundary conditions so that the problem is linear.
   2) Thermal loads are applied to the FEA model and temperatures generated
   3) Temperatures at select locations are compared to the radiation simplification calculations
   4) Mechanical loads are added
   5) Stresses are generated
   6) Stress classification results are generated
   7) Results are verified by comparison to something (e.g., ~~for example~~ BPVVC Section VIII Division 2 Part 5 Design by Analysis)
   8) Results are compared to the construction code
d) Note if any of the geometry is not included in the stress model

SX.4.2.2 STRUCTURAL DESCRIPTION / MESH / STRESS CLASSIFICATION LINE LOCATIONS

a) Reference the geometry source or show a drawing or sketch with dimensions that relate the model geometry to the actual structure in the FEA analysis
b) Name all the parts, usually best done with a sketch
c) Note any symmetry
d) Give the type of element used for each component
e) Describe the mesh type (e.g., h, p , 2D, 3D), shape, and order (2nd order or above) and show plots of the mesh

f) Show the top and bottom of shells or beam orientations and indicate if they are thick or thin elements
g) Show the cross sections with stress recovery points for beams
h) Describe any boundary conditions such as supports, restraints, loads, and forces as well as the method of restraining the model to prevent rigid body motion.
i) Describe parts that are connected by node sharing or contact and tell whether the connections are thermal, mechanical, or both
j) Give the stress classification line locations (usually best done with a sketch)

SX-4.2.3 Material Properties

a) List properties used for every component, references to other sources are not sufficient. They must be explicitly listed. Show the values of any properties modified for the sake of the model. For example, the model density is often modeled.
b) Show calculations for properties that are modified for the sake of the model.
c) Discuss any given artificial properties for the analysis (~~for example~~e.g., ~~-~~the modulus was set to 1000 psi so that the component would not influence the mechanical model. Or, above 1200°F the properties are assumed to be constant).
d) Reference the source for all material properties.

SX-4.2.4 Restraints and loads

a) Show all restraints and loads
b) Discuss the justification for all restraints and loads, and give calculations if they were done to determine the restraints or loads (~~for example~~e.g., end pressure).
c) Discuss any contact regions.
d) Give initial or default temperatures.

SX-4.2.5 Validation

a) Describe how the model was validated.
b) Describe the accuracy of the model digitization either by use of convergence or to the accuracy of previous successful models.

SX-4,2,6 Results

For each model the following should be presented

a) Give temperature plots.
b) Give deformed geometry plots
c) Give stress classification line results and comparison to Code allowable.
d) Relate the results of the model to the defined allowable stresses of the original Code of construction.
e) Refer to ASME Section VIII, Division 2, Part 2, ~~Section~~ Paragraph 2.3.3.1(c)(2) Documentation requirements of design-by-analysis calculations in Part 5.

SX-4.2.7 Reference Documents Used:

Typical reference documents could include:

a) ASME BPVC II-D
b) ASME BPVC Section VIII Division 1
c) ASME BPVC Section VIII Division 2

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d) ASME/API-579
e) Drawings
f) User Design Specification (UDS)
g) ASCE ~~7-05~~

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Inspector Review Guidelines for Finite Element Analysis (FEA)

Revision date: July 1, 2014

NB FEA Task Group

NB 13-1302 Revised July 15, 2015

Inspection of Static Vacuum Insulated Cryogenic Vessels

This section covers the periodic inspection and testing of static vacuum insulated cryogenic pressure vessels used in the storage of ~~refrigerated~~ cryogenic liquefied gases. Owner-users should inspect static cryogenic vacuum-insulated storage tanks to ensure that the equipment is in safe serviceable condition.

ADD TO GLOSSARY:

CRYOGENIC: Cryogenic liquid products are products stored at or below -238 °F (-150°C); and as low as -452°F (-269°C). Liquid oxygen, argon, nitrogen and hydrogen & helium are types of cryogenic liquids stored at ~~temperatures~~ these temperatures.

Low temperature tanks can store products at temperatures as low as -60°F (-51°C). ~~:~~ Liquefied gases including butadiene, butane, ammonia, carbon dioxide, chlorine, propane, propylene, LNG, LPG, ethylene, are ~~low temperature products~~not considered cryogenic.

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A static vacuum insulated cryogenic vessel is a vessel that is thermally insulated for use with one or more cryogenic fluids, consisting of: 1) an inner vessel holding the cryogenic fluid, 2) an outer jacket that serves as an air tight enclosure which supports the inner vessel, holds the insulation and enables the vacuum to be established, and 3) the associated piping system.

~~Outdoor installation general observation:~~General Observations on Outdoor Vessels

Check that the following conditions or ~~safe guards~~safeguards are adequate prior to doing a periodic external inspection of the vessel:

- **Surface water drainage is directed away from the location of installation. Proximity of storage tank to sewer inlets shall comply with local ~~fire code~~jurisdictional requirements.**
- ~~**Installations are in place, such as a wall, to prevent gases from spreading across the location if there is a slope between vessels (and lower rooms if any)**~~
- **Protective measures are in place for the vessels and components from mechanical impact damage (such as barricades, safe set-back distances, ~~polls~~ poles and bars.**
- **Any fire proofing for external supports is in acceptable condition. ~~Protection is in place for the external vessel supports from leaking cryogenic fluid~~**
- **Any gas from pressure relief devices or vents is discharged to a safe place. Relief valve discharges are not aimed directly at external supports or the outer jacket wall.**
- **There is sufficient ventilation to avoid the formation of explosive gas-air mixtures or an oxygen deficient/enriched atmosphere.**

NB 13-1302 Revised July 15, 2015

Periodic Visual Inspection:

A periodic external visual inspection of the vessel and equipment should be made to ensure that the vacuum between the inner vessel and outer jacket has not been compromised. If the vessel has lost vacuum, the owner-user of the cryogenic storage vessel shall immediately investigate the cause. Any loss of vacuum should be investigated as this could affect the integrity of the vessel and support system. If the cause is due to an internal pipe failure as evidenced by vapor escaping from the vacuum relief device, the pressure should be immediately reduced to atmospheric pressure followed by emptying of all of the cryogenic liquid in a safe manner.

External visual inspections are possible at all accessible parts of the vessel and piping. The following inspections should be included as part of the periodic external visual inspection.

- **A functional check of essential and critical valves and their operability.**
- **Leak tests under operating conditions of the vessel and piping.**
- **Assessing if there have been any significant changes in the operational conditions of the installation and its surroundings.**
- **Check that there is no excessive out-of-roundness or deformation of the outer vessel**
- **Check all nozzles for corrosion or damage. ~~attachments~~**
- **Check the vessel supports ~~to make sure there is no~~for structural damage.**
- **Check that any attachments to the outer jacket are not damaged or affecting the vessel condition.**
- **Verification of periodic testing and repair (or replacement) of the pressure relief device(s)**
- **Check that the pressure relief device(s) are not continually venting. PRD's may vent periodically under normal circumstances but should be reported for maintenance testing and repair if venting continually.**
- **Checking the condition of the outer ~~vessel~~jacket, piping and accessories**
- **Check for abnormal frosting on outer ~~vessel~~ jacket surface. Under normal usage, frost and ice will develop around pipes, valves, controls and vaporizers . Inspect the outer skin of the outer ~~vessel~~ jacket for any new or abnormal signs of excessive frosting.**
- **Confirm that the duplicate ASME nameplate is attached to the outer jacket or tank leg.**

~~Extended Interval Pressure Testing~~

~~The Owner-User should consider conducting a pressure test of the vessel at extended intervals, such as every 8 to 15 years. An example is a pneumatic pressure test at 110% of design pressure. At the same time, a vacuum test, such as for 3 hours, may also be conducted.~~

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1.2- Administration

Add to end of Part 2, Section 1.2

Unless otherwise specifically required by the jurisdiction, the duties of the Inspector do not include inspection to other standards and requirements (e.g.,environmental, construction, electrical, operational, undefined industry standards, etc) for which other regulatory agencies have authority and responsibility to oversee.

Proposed New Supplement for Part 2

Inspection of Biomass Fired Boiler Installations (Section 6, Supplement 9)

S9.1 - Scope

a) This supplement provides ~~rules~~ guidelines for continued inspection of biomass fired boilers and the additional equipment utilized in these installations. In this context Biomass is intended to mean various types of wood wastes, or wood byproducts.

b) Many of the requirements of the earlier Sections of Part 2 are common to all boiler installations irrespective of the fuel being fired; therefore this supplement will address the differences that occur when solid fuels, such as Biomass, are being used. Thus the primary thrust of this section will be directed toward the inspection of the fuel handling and distribution systems, and the impact these systems may have on the pressure vessel itself.

S9.2 – Assessment of Installation

a) A general assessment of the complete installation shall be undertaken, in terms of observable results of operating and maintenance practices. Indicators include the general boiler room cleanliness, for example significant quantities of fuel particles (dust) should not be apparent in the boiler room, including rafters and beams.

b) The combustion air inlet shall be free of any debris or dust particle build up, and where moveable louvered intakes exist, the actuating mechanisms shall be clean and operate freely. Corrective action is required when non-compliance is noted.

c) The flue gas venting system shall be checked for tightness, with no observable signs of leakage. Corrective action is required if leakage is noted.

d) The intakes of the various fans or blowers shall be free of fuel particle build up or signs of other debris. Corrective action in terms of cleaning is required when discrepancies are noted.

e) The fuel metering equipment and the fuel transportation system shall be free from signs of particulate or dust leakage. Corrective action in terms of cleaning and repair work is required as necessary.

f) Electrical equipment and controls shall be properly protected from the ingress of dust, by ensuring that all cover plates are properly installed and all panel doors are intact, operable and closed.

g) Verify that all guards for rotating equipment (shafts, bearings, drives) are correctly installed and fan inlet screens are in place.

h) On the boiler, generally check for signs of potential problems, including but not limited to;

- Water leaks
- Ash Leaks
- Condition of insulation and lagging.
- Casing leaks or cracks
- ~~Check a~~All safety valves for bypass and ensure the inspection plugs are capped and the drain lines are piped away from traffic areas.
- Missing or misaligned pieces or parts ~~(ie~~ e.g., twisted, misaligned or bound up buck stays, missing linkage bolting~~)~~.
- Condition of support systems
- Provision of “Danger” or “Caution” signs
- Excess vibration
- Excess noise.

i) Verify that the Owner/User has established function test, inspection, requirements, maintenance and testing of all controls and safety devices in accordance with the manufacturer’s recommendations. Verify that these activities are conducted at assigned intervals in accordance with written procedures, non-conformances which impact continued safe operation of the boiler are corrected and the results are properly documented. These activities shall be at a frequency recommended by the manufacturer, or frequency required by the jurisdiction. Where no frequencies are recommended, or prescribed, the activity should be conducted at least annually

S9.3 – Boiler Room Cleanliness

a) While boiler room cleanliness is of primary importance in all boiler rooms it is of particular importance in biomass fired boiler rooms. Biomass can contain fine particulate, which if allowed to leak from the transportation system into the surrounding boiler room, will eventually be drawn into fans, resulting in the possibility of combustion air systems becoming plugged.

b) Boiler rooms containing quantities of fine dusts are susceptible to fire or explosion, again emphasizing the need for high standards of cleanliness.

S9.4 – Emission Control Requirements

a) Emission control is dependent upon the fuel being fired and the emission requirements prevailing at the location of the boiler installation. As such they are a part of the initial design and installation process, and apart from ensuring that they are kept in top working condition, so that emission requirements are not violated; there is little that can be done from the inspector's point of view.

b) When Continuous Emissions Monitors (CEM's) are in use, they should be demonstrated to be functioning properly and have a current calibration sticker.

c) Delta-P pressure gauges which measure the pressure drop across the various elements of the emission control system should all be functioning correctly.

d) There should be no sign of erosion caused by entrained particulate matter, in any part of the breaching, ductwork, stack or the individual emission control elements.

e) On systems in which the emissions control system incorporates a baghouse, appropriate fire detection and suppression systems shall be incorporated and functioning properly.

2.3.6.6 INSPECTION OF WIRE WOUND PRESSURE VESSELS

(a) This section provides guidelines for inspection of wire wound pressure vessels typically designed for 10,000 psi or greater service. The scope of inspection of these vessels should include components affected by repeated opening and closing, such as the frame, yolk and cylinder inner diameter surface, or alignment of the yolk with the cylinder, lack of maintenance and a check for inoperable or bypassed safety and warning devices.

(b) These vessels consist of four parts, a wire wound cylinder, two end closures and a frame to retain the closures in the cylinder. The wire is one continuous piece and is wound in tension. On the cylinder, the wire can only carry circumferential or radial loading. The cylinder is typically not of sufficient thickness to carry axial load which requires the end closures have no threads or retaining grooves and requires a frame to retain the pressure vessel axial load imposed on the closures. The purpose for this design is to minimize weight of the containment cylinder using thinner wall materials and using external wound wire to induce a compressive preload. This design also provides increased resistance to damage from fatigue loading.

Note that some vessels may be monoblock cylinders (no winding) with wire wound frame and some vessels may be wire wound cylinder with a forged or welded plate frame (not wire wound). Use of a frame to retain the end closures removes the sharp transitions in shape (threads or grooves) associated with monoblock cylinder failures. The design of high pressure vessels is typically based on fatigue life criteria. The majority of operating wire wound vessels in North America today were fabricated under the rules of ASME BPVC Section VIII Division 3, Alternative Rules for Construction of High Pressure Vessels. Some inservice vessels may have been constructed the ASME BPVC Section VIII Division 1 or Division 2 rules, and others installed as “State Specials” that still require fatigue life analysis to determine a safe operating life. The primary failure mode is fatigue cracking. Early detection of any damage to the cylinder, closures or frame is essential to avoid catastrophic failure

High pressure design requires use of high strength materials, which have relatively low ductility. The material thickness required for reasonable fatigue life is greatly reduced by the pre-tensioned wire wound design. Typical winding design provides compression sufficient that at vessel design conditions there is no circumferential stress in the cylinder. These vessels have been used in various industrial applications, including foods and drinks processing, ceramic or refractory processing and powdered metal processing utilizing a liquid compressing fluid at ambient or slightly elevated temperature. The most frequent of these are isostatic pressing and hydrostatic extrusion. Isostatic pressing can be performed at either cold temperatures, at room temperature, with liquid as the pressure medium, or hot, at temperatures of 2000 to 3300°F with gas as the pressure medium. In hot isostatic presses, the vessel wall is separated from the hot space by insulation, which keeps the vessel wall operating at a low temperature of approximately 120 to 180°F.
Cold pressing is used for regular production at pressures up to 87,000 psi. Ceramic, refractory and metal processing is also performed at elevated temperature, up to 3632°F (2000°C). The “hot” processes utilize an inert gas fluid pressure up to 45,000 psi (310

MPa). Continuous cooling is necessary for the hot process and may contribute to corrosion damage of the cylinder of closures.
Hydrostatic extrusion is generally performed either cold, at room temperature, or warm, at temperatures up to 1110°F, in both cases with liquid as the pressure medium. Hydrostatic extrusion is used for regular production at pressures up to 200,000 psi. Both cold and hot processes are commonly found in research facilities and in universities.

(c) Record keeping

(1) Since these vessels have a finite fatigue life, it is essential a record be maintained of each operating cycle, recording both temperature and pressure. Deviation beyond design limits is cause for suspending operation and reevaluation of remaining fatigue life. Vessels having no operating record should be inspected and a fracture mechanics evaluation with a fatigue analysis test be performed to establish remaining life before resuming operation.

(2) Operating data should be recorded and include the following whenever the vessel is operating:

a. Number of cycles
b. Maximum pressure
c. Maximum temperature

(d) Any unusual conditions (d) Any damage to the cylinder or closures can lead to premature failure. Frequent visual inspection should be made of internal and external surfaces of the cylinder, frame and closures. A thorough examination should be completed if any visually apparent damage is identified or if any excursion beyond design temperature or pressure occurs.

In addition, surfaces of the cylinder and closures should be examined by dye penetrant or magnetic particle method at intervals based on vessel remaining life. Closures may require ultrasonic examination of passageways.

Following is an example of what the results of such a study might reveal as allowable cycles for a particular wire wound vessel:

Columns	> 10^6 Cycles	“Columns” are beams on either side of frame, between the yokes.
Yokes	> 10^6 Cycles	“Yokes” are the circular ends of the frame.
Wires of frames	> 10^6Cycles	“Wires” place frame in compression
Cylinder	100 X 10^3 cycles	
Wires of Cylinder	60 X 10^3 cycles	“Wires” place cylinder in compression.
Closures	30 X 10^3 cycles	All connections to the vessel are through the closures. These passageways create stress raisers, as do grooves for sealing system.

The vessel design life in this example is thus limited by the closure. The calculated design life is 30,000 cycles at design pressure and temperature.

An acceptable factor of safety for vessel fatigue inspection interval varies between 0.25 and 0.5 of the remaining design life. The inspection interval for the above example is therefore 10,000 to 20,000 cycles, but should not exceed five years.

In addition to scope of frequent inspection, the fatigue inspection should include measurement of the cylinder inside diameter and frame inside length to detect reduced tension in the wire windings. Note that monoblock cylinders and plate frames require additional inspection due to differing construction.

If a crack or flaw is detected during any inspection, an immediate evaluation, repair and study of impact on remaining fatigue life should be completed by a National Board authorized repair agency. Using the results of this study, and application of safety factor 0.25 (due to known damage), the number of cycles of operation to the next fatigue inspection is established.

As part of the frequent inspection, the following items should be reviewed:

(1) Verify no change in the process, such as the processing fluid, that might adversely impact vessel integrity.

(2) Review the vessel manufacturer's inspection recommendations for vessel, closures and frame. If manufacturer's recommendations are not available, obtain recommendations from a recognized wire wound vessel service provider.

(3) Verify any repair to pressure retaining items has been completed by National Board authorized service provider having wire wound vessel expertise.

(4) Verify overpressure protection with appropriate set pressure and capacity is provided. Rupture discs are commonly used for pressures exceeding 14,500 psi (100 MPa) to avoid valve seat leakage. Overpressure protection devices are frequently replaced to avoid premature operation.

(e) Additional Inspection Criteria

(1) If there are no manufacturer's recommendations available for the vessel, the following are additional recommended inspections that should be conducted to ensure vessel integrity and safety

a. Conduct annual visual and dimensional vessel inspections with liquid penetrant examination of maximum stressed areas to ensure that the surfaces are free of defects. Conduct ultrasonic examination of the vessel after every 25% of the design cycle life or every five years, whichever comes first, to detect subsurface cracks. Special attention Should be given to the roots of threads and closures using threaded head retention construction. Other geometric discontinuities that are inherent in the design or irregularities resulting from localized corrosion, erosion, or mechanical damage should be carefully examined. This is particularly important for units of monoblock construction.

b. The closure mechanism of the vessel end-closure is opened and closed frequently during operation. It should be closely inspected for freedom of movement and proper contact with its locking elements. Wire wound vessels must have yoke-type closures so the yoke frame will need to be closely inspected on a regular basis

c. Should pitting, cracks, corrosion, or other defects are found during scheduled inspection; verify that an evaluation using fracture mechanics techniques is performed. This is to determine MAWP, cyclic life and extent of NDE frequency based on crack growth rate.

(2) Gages, Safety Devices, and Controls

a. Verify that the vessel is provided control and monitoring of the pressure, temperature, electrical system, fluid flow, liquid levels, and all variables that are essential for the safe operation of the system. If the vessel is automatically controlled, manual override should be available. Also, safety interlocks should be provided on the vessel closure to prevent vessel pressurization if the vessel closure is not complete and locked.

b. Verify that all safety device isolation valves are locked open if used.

c. Verify appropriate pressure relief device is installed with relief setpoint at low a pressure as possible, consistent with the normal operating pressure but in no case higher than the design operating pressure of the vessel. Rupture discs are normally considered more suitable for these types of applications since pressure relief devices operating at pressures above 14500 psi may tend to leak by their seat.

d. Verify that pressure and temperature of the vessel coolant and vessel wall is controlled and monitored. Interlock devices associated with these monitoring devices that will deenergize or depressurize the vessel are strongly recommended due to the potential significant damage that can be caused by release of energy in the event of overpressurization due to excess pressure or temperature in the vessel.

e. Verify audible and visual alarms are installed to indicate unsafe conditions.

c) General Corrosion

For a corroded area of considerable size, the thickness along the most damaged area may be averaged over a length not exceeding 10 in. (250 mm). The thickness at the thinnest point shall not be less than 75% of the required wall thickness, and the average shall not be less than 90% of the required wall thickness. When general corrosion is identified that exceeds the limits set forth in this paragraph, the pressure vessel shall be removed from service until it is repaired by a qualified "R" Stamp holder or permanently removed from service unless an acceptable for service evaluation is performed in accordance with NBIC Part 2, 4.4.

S7.8.6 ANHYDROUS AMMONIA SERVICE

Containers that have been previously used in anhydrous ammonia service shall not be converted to LPG service. Any blue coloring of the brass valves indicates that the container has been in anhydrous ammonia service.

S7.9 ASME LPG CONTAINERS LESS THAN 2000 GALLONS BEING REFURBISHED BY A COMMERCIAL SOURCE.

Commercially refurbished containers are used containers that are temporarily taken out of service for repair and or renewal and sent to a company which specializes in this type of work. Because the history of some of these containers is unknown, special attention shall be given to inspection and repair before returning any of these containers back to service. ASME LPG containers less than 2,000 gal. (7,570 l) may be refurbished subject to the following conditions:

a) A complete external inspection shall be completed under the guidelines of this supplement. If any defects are found, as defined in S7.8.1 through S7.8.5, the defect shall be repaired under NBIC Part 3, Repairs and Alterations, by qualified personnel or permanently removed from service;

b) Containers that have been previously used in anhydrous ammonia service shall not be converted to LPG service. See NBIC Part 2, S7.8.6;

c) The coating on the outside of the container shall be removed down to bare metal so that an inspection can be performed under the guidelines of this supplement; and

d) Verify that there is no internal corrosion if the tank has had its valves removed or is known to have been out of service for an extended period.

(15) ## S7.10 REQUIREMENTS FOR CHANGE OF SERVICE FROM ABOVE GROUND TO UNDERGROUND SERVICE

ASME LPG storage vessels may be altered from above ground (AG) service to underground (UG) service subject to the following conditions.

a) Vessels that have been previously used in anhydrous ammonia service are not permitted to be converted to LPG service.

b) The outside surface of the vessel shall be cleaned to bare metal for an external inspection of the vessel under the guidelines of this supplement. Prior to placing underground, the outside surface of the vessel shall be prepared consistent with the paint manufactures specification and coated with a coating suitable for UG service. Any touch-up coating shall be the same coating material. All corrosion shall be repaired in accordance with the NBIC.

c) Verify that there is no internal corrosion due to valves having been removed while the container is out or service.

d) Any unused connections located on the vessel shall be closed by seal welding around a forged plug or removed using a flush patch. If a flush patch is used the material shall be the same material thickness and material grade as the original code of construction.

e) All connections on top of the vessel, except for the liquid withdrawal opening, shall be replaced with a riser pipe with multi-valve suitable for UG LPG service. The valve shall be enclosed in a protective housing and placed underground in accordance with jurisdictional requirements.

f) The liquid withdrawal opening shall be located within the protective housing.

g) The liquid level tube in the multivalve shall be the length required according to jurisdictional requirements.

h) The NBIC nameplate shall be made of stainless steel and continuous welded to the vessel wall. The nameplate shall also have the information from the original nameplate. This shall include the manufactures name, container serial number, National Board number, (if registered with the National Board) MAWP, year built, head and shell thickness, be stamped for “UG service”, the “liquid level tube length = inches” and the National Board “R” stamp. The original manufacturer’s nameplate shall remain attached to the vessel. See Part 2, Section 5.2 of this Part and NBIC, Part 3, Section 5.7 for additional stamping requirements.

i) The support legs and lifting lugs may remain in place and shall be welded around the entire periphery to prevent crevices that create a potential area for corrosion. Unused attachments shall be removed and welds ground flush.

j) A connection shall be added for the attachment of an anode for cathodic protection, per NFPA, 58 .

~~k) All welding shall be performed by a holder of a current “R” Certificate of Authorization, using a qualified welding procedure.~~

k) All welding shall be performed by a holder of a current "R" Certificate of Authorization in accordance with NBIC Part 3.

2.3.6.8 INSPECTION OF PRESSURE VESSELS FOR HUMAN OCCUPANCY (PVHO's)

A pressure vessel for human occupancy (PVHO), as defined by ASME PVHO-1 is a pressure vessel that encloses a human being or animal within its pressure boundary while it is subject to internal or external pressure that exceeds a 2 psi (14 kPa) differential pressure. PVHOs include, but are not limited to submersibles, diving bells, personal transfer capsules, decompression chambers, recompression chambers, hyperbaric chambers, high altitude chambers and medical hyperbaric oxygenation facilities.

This section provides guidelines for inspection of PVHOs. Due to the many different designs and applications of PVHOs, potential failures of components or safety concerns that are not specifically covered, such as rapid decompression or fire/sparking issues should be considered.

a) General/operational

1) PVHOs ~~must~~ should be constructed in accordance with ASME PVHO-1 ~~and PVHO-2~~. This code~~s~~ adopts Section VIII and therefore the vessels should bear a "U" or "U2" ASME designator. Inspections may be conducted using ASME PVHO-2 for reference.

2) Cast and ductile iron fittings are not allowed.

3) Due to the human occupancy element, a person should be in attendance to monitor the PVHO when in operation, in the event there is an accident.

4) The installation should be such that there is adequate clearance to inspect it properly. In some applications, such as underground tunneling, it may be impossible to perform a complete external inspection.

b) Internal Inspection

1) Where existing openings permit, perform a visual internal inspection of the vessel. Look for any cracks and note areas that are subject to high stress such as welds, welded repairs, head-to-shell transitions, sharp interior corners, and interior surfaces opposite external attachments or supports.

2) The vessel should be free of corrosion, damage, dents, gouges or other damage.

3) All openings leading to external fittings or controls should be free from obstruction.

4) All exhaust inlets should be checked to prevent a chamber occupant from inadvertently blocking the opening.

c) External Inspection

1) The Inspector should closely examine the external condition of the pressure vessel for corrosion, damage, dents, gouges or other damage.

2) The lower half and the bottom portions of insulated vessels should receive special focus, as condensation or moisture may gravitate down the vessel shell and soak into the insulation, keeping it moist for long periods of time. Penetration locations in the insulation or fireproofing such as saddle supports, sphere support legs, nozzles, or fittings should be examined closely for potential moisture ingress paths. When moisture penetrates the insulation, the insulation may actually work in reverse, holding moisture in the insulation and/or near the vessel shell.

5) Insulated vessels that are run on an intermittent basis or that have been out of service require close scrutiny. In general, a visual inspection of the vessel's insulated surfaces should be conducted once per year.

6) The most common and superior method to inspect for suspected corrosion under insulation (CUI) damage is to completely or partially remove the insulation for visual inspection. The method most commonly utilized to inspect for CUI without insulation removal is by x-ray and isotope radiography (film or digital) or by real time radiography, utilizing imaging scopes and surface profilers. The real time imaging tools will work well if the vessel geometry and insulation thickness allows. Other less common methods to detect CUI include specialized electromagnetic methods (pulsed eddy current and electromagnetic waves) and long range ultrasonic techniques (guided waves).

7) There are also several methods to detect moisture soaked insulation, which is often the beginning for potential CUI damage. Moisture probe detectors, neutron backscatter, and thermography are tools that can be used for CUI moisture screening.

8) Proper surface treatment (coating) of the vessel external shell and maintaining weather tight external insulation are the keys to prevention of CUI damage.

d) Inspection of Parts and Appurtenances (piping systems, pressure gage, bottom drain)

1) As stated above, cast iron is not allowed on PVHO's and shall be replaced with parts fabricated with other suitable materials, in accordance with ASME Code Section II.

2) If valves or fittings are in place, check to ensure that these are complete and functional.

3) The Inspector shall note the pressure indicated by the gage and compare it with other gages on the same system. If the pressure gage is not mounted on the vessel itself, it should be ascertained that the gage is installed on the system in such a manner that it correctly indicates actual pressure in the vessel.

4) The Inspector shall verify that the vessel is provided with a drain opening.

5) The system should have a pressure gage designed for at least the most severe condition of coincident pressure in normal operation. This gage should be clearly visible to the person adjusting the setting of the pressure control valve. The graduation on the pressure gauge shall be graduated to not less than 1.5 times the MAWP of the vessel.
6) Provisions should be made to calibrate pressure gages or to have them checked against a standard test gage.
7) Any vents and exhausts should be piped at least 10 feet from any air intake.
8) Venting should be provided at all high points of the piping system.

e) Inspection of Viewports / Windows
1) Each window should be individually identified and be marked in accordance with PVHO-1
2) If there are any penetrations through windows, they must be circular.
3) Windows must be free of crazing, cracks and scratches.
4) Windows and viewports have a maximum interval for seat/seal inspection and refurbishment. Documentation should be checked to ensure compliance with PVHO-2, Table 7.1.3.

f) Inspection of Pressure Relief Devices
1) Pressure relief devices must have a quick opening manual shutoff valve installed between the chamber and the pressure relief device, with a frangible seal in place, within easy access to the operator.
2) The pressure relief device shall be constructed in accordance with ASME Code Section VIII.

3) The discharge from the pressure relief device must be piped outside to a safe point of discharge.
4) Rupture disks may be used only if they are in series with a pressure relief valve, or when there is less than 2 cubic feet of water volume.
5) Verify that the safety valve is periodically tested either manually by raising the disk from the seat or by removing and testing the valve on a test stand.

g) Acceptance Criteria
The following forms are required to be completed:
1) Form PVHO-1 Manufacturer's Data Report for Pressure Vessels for Human Occupancy
2) Form PVHO-2 Fabrication Certification for Acrylic Windows

h) All PVHO's under the jurisdiction of the U.S. Coast Guard must also comply with 46 CFR Part 197.

NB15-0801 – Part 2, S10 - , NB15-0901
(PM) Mooney, Newton, Welch, Barker

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Section/Subsection Referenced: **Supplement 10, Inspection of Liquid Carbon Dioxide Storage Vessels**

Comment/Recommendation: *Proposed Solution:* ☐ New Text ☒ Revise Text ☒ Delete Text

AIA believes that several aspects of the proposed requirements are either undefined or otherwise beyond the normal scope and training of National Board Commissioned Inspectors. Imposing these requirements on Special Inspectors may also place them in the untenable position of assuming liability beyond the limits of the insurance policies under which they perform inspections. Items of concern include the failure to define the terms "sufficient clearance" (S10.2b), "safely supported" (S10.2d), "guarded (S10.2f); and "permanent" (S10.3a). We recommend either defining or deleting these terms. Furthermore, Commissioned Inspectors are not qualified to (i) determine whether a CO2 detector is set to alarm at any particular concentration (S10.5); (ii) verify the posting of warning signs and determine the setpoint of any alarms (S10.6); or (iii) determine the length of safety relief/vent lines or verify that the materials selected for valves, piping, tubing, hoses and fittings used in the LCDSV system meet certain requirements. We recommend deleting these sections.

SUPPLEMENT 10 INSPECTION OF LIQUID CARBON DIOXIDE STORAGE VESSELS

S10.1 SCOPE

This supplement provides ~~requirements~~ guidelines for the inspection of Liquid Carbon Dioxide Storage Vessels (LCDSVs),fill boxes, fill lines and pressure relief discharge/vent circuits used for carbonated beverage systems, swimming pool pH control systems and other fill in place systems storing liquid CO_2.

S10.2 GENERAL REQUIREMENTS (ENCLOSED AND UNENCLOSED AREAS)

The ~~Inspector~~ inspection ~~shall~~ should verify that LCDSVs are:

a) ~~are~~ not ~~be~~ located within 10 feet (3050 mm) of elevators, unprotected platform ledges or other areas where falling would result in dropping distances exceeding half the container height;
b) ~~are~~ installed with ~~sufficient~~ clearance for filling, operation, maintenance, inspection and replacement;
c) ~~are~~ not ~~installed~~ located on roofs;
d) ~~are safely~~ supported ~~as~~ to prevent the vessel from tipping or falling and meet seismic requirements as needed.;
e) ~~are~~ not located within 36 in. (915 mm) of electrical panels; and

f) located outdoors in areas in the vicinity of vehicular traffic are protected with barriers designed to ~~guarded to~~ prevent accidental impact by vehicles.

S10.3 ENCLOSED AREA LCDSV INSTALLATIONS

The ~~Inspector~~ inspection ~~shall~~ should verify that:

a) ~~Permanent~~ LCDSV installations that are not periodically removed with remote fill connections:

1) Are equipped with a gas detection system installed in accordance with NBIC Part 2, S10.5

2) Have signage posted in accordance with NBIC Part 2, S10.6

3) Are equipped with fill boxes; fill lines and safety relief/vent valve circuits installed in accordance with NBIC Part 2, S10.4.

b) Portable LCDSV installations with no permanent remote fill connection:

Warning: LCDSVs shall not be filled indoors or in enclosed areas under any circumstances. Tanks must always be moved to the outside to an unenclosed, free airflow area for filling.

1) Are equipped with a gas detection system installed in accordance with NBIC Part 2, S10.5**;**

2) Have signage posted in accordance with NBIC Part 2, S10.6.

3) Have a safety relief/vent valve circuit connected at all times except when the tank is being removed for filling. Connections may be fitted with quick disconnect fittings meeting the requirements of NBIC Part 2, S10.4.

4) Are provided with a pathway that provides a smooth rolling surface to the outdoor, unenclosed fill area. There shall not be any stairs or other than minimal inclines in the pathway.

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S10.4 FILL BOX LOCATION /SAFETY RELIEF/VENT VALVE CIRCUIT TERMINATION

The ~~Inspector~~ inspection ~~shall~~ should verify that fill boxes and/or vent valve terminations are installed above grade, outdoors in an unenclosed, free airflow area, and that the fill connection is located so not to impede means of egress or the operation of sidewalk cellar entrance doors, including during the delivery process and that they are:

a) At least three (3) feet (915 mm) from any door or operable windows;*

b) At least three (3) feet (915 mm) above grade;*

c) Not located within ten (10) feet (3050 mm) from side to side at the same level or below, from any air intakes;*

d) Not located within ten (10) feet (3050 mm) from stair wells that go below grade.*

* Note: Many systems installed prior to 1/1/2014 do not meet the above requirements and the local Jurisdiction should be consulted for guidance.

S10.5 GAS DETECTION SYSTEMS

Rooms or areas where carbon dioxide storage vessel(s) are located indoors or in enclosed or below grade outdoor locations shall be provided with a gas detection and alarm system for general area monitoring that is capable of detecting and notifying building occupants of a CO_2 gas release. Alarms will be designed to activate a low level pre-alarm at 1.5% concentration of CO_2 and a full high alarm at 3% concentration of CO_2 which is the NIOSH & ACGIH 15 minute Short Term Exposure Limit for CO_2. These systems are not designed for employee personal exposure monitoring. Gas detection systems shall be installed and tested in accordance with manufactures installation instructions and the following requirements:

a) The ~~Inspector~~ inspection ~~shall~~ should verify that the gas detection system and audible alarm is operational and tested in accordance with manufacturer's guidelines.

b) The ~~Inspector~~ inspection ~~shall~~ should verify that audible alarms are placed at the entrance(s) to the room or area where the carbon dioxide storage vessel and/ or fill box is located to notify anyone who might try to enter the area of a potential problem.

S10.6 SIGNAGE

The ~~Inspector~~ inspection ~~shall~~ should verify that warning signs are posted at the entrance to the building, room, enclosure, or enclosed area where the container is located. The warning sign shall be at least 8 in (200mm) wide and 6 in. (150mm) high. The wording shall be concise and easy to read and the upper portion of the sign must be orange as shown in figure NBIC Part 2, Figure S10.6. The size of the lettering must be as large as possible for the intended viewing distance and in accordance with jurisdictional requirements. When no jurisdictional requirements exist, the minimum letter height shall be in accordance with NEMA American National Standard for Environmental and Facility Safety Signs (ANSI Z535.2). The warning signs shall be as shown in figure S10.6.

Figure S10.6

Additional instructional signage shall be posted outside of the area where the container is located and such signage shall contain at minimum the following information:

a) Carbon dioxide monitors for general area monitoring (not employee personal exposure monitoring) are provided in
this area. These monitors are set to alarm at 5,000 ppm(1.5% concentration) for the low level alarm and at 30,000 ppm (3% concentration) for high level alarm.
b) Low Level Alarm (5,000 ppm) – Provide appropriate cross ventilation to the area. Personnel may enter area for short periods of time (not to exceed 15 minutes at a time) in order to identify and repair potential leaks.
c) High Level Alarm (30,000 ppm) – Personnel should evacuate the area and nobody should enter the affected area without proper self-contained breathing apparatus until the area is adequately ventilated and the concentration of CO_2 is reduced below the high alarm limit.

S10.7 VALVES, PIPING, TUBING AND FITTINGS

a) Materials – The ~~Inspector~~ inspection should ~~shall~~ verify that the materials selected for valves, piping, tubing, hoses and fittings used in the LCDSV system meet following requirements:

1) Components shall be rated for the operational temperatures and pressures encountered in the applicable circuit of the system.
2) All valves and fittings used on the LCDSV shall be rated for the maximum allowable working pressure(MAWP) stamped on the tank.
3) All piping, hoses and tubing used in the LCDSV system shall be rated for the working pressure of the applicable circuit in the system and have a burst pressure rating of at least four times the MAWP of the piping, hose or tubing.

b) Relief Valves – The ~~Inspector shall~~inspection should verify that each LCDSV shall have at least one ASME/NB stamped & certified relief valve with a pressure setting at or below the MAWP of the tank. The relief valve shall be suitable for the temperatures and flows experienced during relief valve operation. The minimum relief valve capacity shall be designated by the manufacturer. Additional relief valves that do not require ASME stamps may be added per Compressed Gas Association pamphlet, CGA S-1.3 Pressure Relief Device Standards Part 3, Stationary Storage Containers for Compressed Gases, recommendations. Discharge lines from the relief valves shall be sized in accordance with NBIC Part 2, Tables S10-a and S10-b.

Note: Due to the design of the LCDSV the discharge line may be smaller in diameter than the relief valve outlet size.
Caution: Company's and or individuals filling or refilling LCDSV's shall be responsible for utilizing fill equipment that is acceptable to the manufacturer to prevent over pressurization of the vessel.

c) Isolation Valves – The ~~Inspector shall~~inspection should verify that each LCDSV shall have an isolation valve installed on the fill line and tank discharge, or gas supply line in accordance with the following requirements:

1) Isolation valves shall be located on the tank or at an accessible point as near to the storage tank a possible.
2) All valves shall be designed or marked to indicate clearly whether they are open or closed.
3) All valves shall be capable of being locked or tagged in the closed position for servicing.
4) Gas supply and liquid CO_2 fill valves shall be clearly marked for easy identification.

d) Safety Relief/Vent Lines – The ~~Inspector~~inspection, where possible, ~~shall~~ should verify the integrity of the pressure relief/vent line from the pressure relief valve to outside vent line discharge fitting. All connections shall be securely fastened to the LCDSV. The minimum size and length of the lines shall be in accordance with NBIC Part 2, Tables S2 10-a and S2 10-b. Fittings or other connections may result in a localized reduction in diameter have been factored into the lengths given by the NBIC Part 2, Tables S2 10-a and S2 10-b.

Table S10-a Minimum LCDSV System Pressure Relief/Vent Line Requirements (Metallic)

Tank Size (Pounds)	Fire Flow Rate Requirements (Pounds per Minute)	Maximum Length of 3/8 inch ID Nominal Metallic Tube Allowed	Maximum Length of 1/2 inch ID Nominal Metallic Tube Allowed
Less than 500	2.60	maximum 80 feet	100 feet
500-750	3.85	maximum 55 feet	100 feet
Over 750-1000	5.51	maximum 18 feet	100 feet

Table S10-b Minimum LCDSV System Pressure Relief/Vent Line Requirements (Plastic/Polymer)

Tank Size (Pounds)	Fire Flow Rate Requirements (Pounds per Minute)	Maximum Length of 3/8 inch ID Plastic/Polymer

Materials Tube Allowed
Maximum Length of ½
inch ID Plastic/Polymer
Materials
Tube Allowed
Less than 500 2.60 maximum 100 feet 100 feet
500-750 3.85 maximum 100 feet 100 feet
Over 750-1000 5.51 maximum N/A see ½ inch 100 feet

Table S10-a Metric Minimum LCDSV System Pressure Relief /Vent Line Requirements (Metallic)

Tank Size
(Kilograms)
Fire Flow Rate
Requirements
(Kilograms per Minute)
Maximum Length of
10mm ID Nominal
Metallic Tube Allowed
Maximum Length of
13mm ID Nominal
Metallic Tube Allowed
Less than 227 1.8 maximum 24 m 30.5 m
227-340 1.75 maximum 17 m 30.5 m
340-454 2.50 maximum 5.5 m 30.5 m

Table S10-b Metric Minimum LCDSV System Pressure Relief/Vent Line Requirements (Plastic/Polymer)

Tank size
(kg)
Fire Flow Rate (kg per
Minute)
Maximum Length of 10
mm ID Nominal Metallic
Tube Allowed
Maximum Length of 10
mm ID Plastic/Polymer
Materials Tube Allowed
Less than 227 1.18 maximum 30.5 m 30.5 m
227-340 1.75 maximum 30.5 m 30.5 m
Over 340-454 2.5 maximum N/A see 13 mm 30.5 m
Note: Due to the design of the LCDSV the discharge line may be smaller in diameter than the pressure relief valve outlet size but shall not be smaller than that shown in tables NBIC Part 2, S10-a and S10-b.

NB15-1701 revised July 14, 2015

S1.4.2.9 STAYBOLTS
Staybolts shall be inspected for:

a) Cracks in or breakage of the body;

b) Erosion of the driven head from corrosion or combustion gases;

c) Staybolt head flush with or below the surface of the sheet;

d) Plugging of telltale holes except as permitted by 49 CFR Part 230.41;

e) Waterside corrosion;

f) Staybolt heads that have been covered over by welding; and

g) Correct application of seal welding to staybolt heads.

Notes: An indicator of waterside corrosion on threaded staybolts is the lack of threads on the section of the staybolt body just above the sheet.

Broken staybolts may be detected by leakage through telltale holes and by hammer testing. Both methods are most effective when the boiler is under hydrostatic pressure of at least 95% MAWP. If a hydrostatic test cannot be applied, the hammer test may be performed alone with the boiler drained.

When a broken stay is found, the stays adjacent to it should be examined closely because these may have become overstressed by addition of the load from the broken stay.

A telltale hole plugged by installation of a nail or pin may indicate the staybolt is broken and requires replacement.

The plugging of telltale holes by refractory to prevent buildup of foreign matter in the telltale hole is permitted for locomotives operating under FRA Jurisdiction per 49 CFR Section 230.41.

One indication that a threaded staybolt leaks during service is when the head of it is found to have been re-driven repeatedly.

h) ~~Threadless~~Un-threaded fillet-welded staybolts shall be inspected for corrosion wear of more than 2/10 (measured in 10ths) of the original dimensions of the head and shaft.

i) ~~Threadless~~Un-threaded fillet-welded staybolts shall be inspected for leakage or signs of leakage. ~~and if~~If leakage in excess of sweat porosity is indicated, the weld shall be removed and the staybolt rewelded, in accordance with NBIC Part 3.~~.~~

FORM NB-6 BOILER-FIRED PRESSURE VESSEL
REPORT OF INSPECTION
Standard Form for Jurisdictions Operating Under the ASME Code

1	DATE INSPECTED MO | DAY | YEAR	CERT EXP DATE MO | YEAR	CERTIFICATE POSTED ☐ YES ☐ NO	OWNER NO.	JURISDICTION NUMBER	☐ NAT'L BD NO. ☐ OTHER NO.	
2	OWNER			NATURE OF BUSINESS	KIND OF INSPECTION ☐ INT ☐ EXT	CERTIFICATE INSPECTION ☐ YES ☐ NO	
	OWNER'S STREET ADDRESS NUMBER			OWNER'S CITY	STATE	ZIP	
3	USER'S NAME – OBJECT LOCATION			SPECIFIC LOCATION IN PLANT	OBJECT LOCATION - COUNTY		
	USER'S STREET ADDRESS NUMBER			OWNER'S CITY	STATE	ZIP	
4	CERTIFICATE COMPANY NAME			CERTIFICATE COMPANY CONTACT NAME	EMAIL		
	CERTIFICATE COMPANY ADDRESS			CERTIFICATE COMPANY CITY	STATE	ZIP	
5	TYPE ☐ FT ☐ WT ☐ CI ☐ OTHER _____		YEAR BUILT	MANUFACTURER			
6	USE ☐ POWER ☐ PROCESS ☐ STEAM HTG ☐ HWH ☐ HWS ☐ OTHER _____			FUEL	METHOD OF FIRING	PRESSURE GAGE TESTED ☐ YES ☐ NO	
7	PRESSURE ALLOWED MAWP _____ THIS INSPECTION _____ PREV. INSPECTION _____			SAFETY-RELIEF VALVES SET AT _____ TOTAL CAPACITY _____		HEATING SURFACE OR BTU (INPUT/OUTPUT)	
8	IS CONDITION OF OBJECT SUCH THAT A CERTIFICATE MAY BE ISSUED? ☐ YES ☐ NO (IF NO, EXPLAIN FULLY UNDER CONDITIONS)			~~HYDRO TEST~~ pressure test ☐ YES _____ PSI DATE _____ ☐ NO			
9	CONDITIONS: With respect to the internal surface, describe and state location of any scale, oil or other deposits. Give location and extent of any corrosion and state whether active or inactive. State location and extent of any erosion, grooving, bulging, warping, cracking or similar condition. Report on any defective rivets, bowed, loose or broken stays. State condition of all tubes, tube ends, coils, nipples, etc. Describe any adverse conditions with respect to pressure gage, water column, gage glass, gage cocks, safety valves, etc. Report condition of setting, linings, baffles, supports, etc. Describe any major changes or repairs made since last inspection.						
10	REQUIREMENTS: (LIST CODE VIOLATIONS)						
11	NAME AND TITLE OF PERSON TO WHOM REQUIREMENTS WERE EXPLAINED:						
	I HEREBY CERTIFY THIS IS A TRUE REPORT OF MY INSPECTION _____ SIGNATURE OF INSPECTOR		IDENT NO.	EMPLOYED BY		IDENT NO.	

This form may be obtained from The National Board of Boiler and Pressure Vessel Inspectors, 1055 Crupper Ave., Columbus, OH 43229 NB-6 Rev. 6

FORM NB-7 PRESSURE VESSELS
REPORT OF INSPECTION
Standard Form for Jurisdictions Operating Under the ASME Code

1	DATE INSPECTED MO | DAY | YEAR	CERT EXP DATE MO | YEAR	CERTIFICATE POSTED ☐YES ☐NO	OWNER NO.	JURISDICTION NUMBER	☐ NAT'L BD NO. ☐OTHER NO.	
2	OWNER				NATURE OF BUSINESS	KIND OF INSPECTION ☐INT ☐EXT	CERTIFICATE INSPECTION ☐YES ☐NO
	OWNER'S STREET ADDRESS				OWNER'S CITY	STATE	ZIP
3	USER'S NAME - OBJECT LOCATION				SPECIFIC LOCATION IN PLANT	OBJECT LOCATION - COUNTY	
	USER'S STREET ADDRESS				USER'S CITY	STATE	ZIP
4	CERTIFICATE COMPANY NAME				CERTIFICATE COMPANY CONTACT NAME	EMAIL	
	CERTIFICATE COMPANY ADDRESS				CERTIFICATE COMPANY CITY	STATE	ZIP
5	TYPE ☐ AIR TANK ☐ WATER TANK ☐OTHER _____			YEAR BUILT	MANUFACTURER		
6	USE ☐ STORAGE ☐ PROCESS ☐ HEAT EXCHANGE ☐OTHER _____				SIZE	PRESSURE GAGE TESTED ☐YES ☐NO	
7	PRESSURE ALLOWED THIS INSPECTION _____ PREVIOUS INSPECTION _____			SAFETY RELIEF VALVES SET AT _____ TOTAL CAPACITY _____		EXPLAIN IF PRESSURE CHANGED pressure test	
8	IS CONDITION OF OBJECT SUCH THAT A CERTIFICATE MAY BE ISSUED? ☐ YES ☐ NO (IF NO EXPLAIN FULLY UNDER CONDITIONS)				~~HYDRO TEST~~ ☐ YES _____ PSI DATE _____ ☐ NO		
9	CONDITIONS: With respect to the internal surface, describe and state location of any scale, oil or other deposits. Give location and extent of any corrosion and state whether active or inactive. State location and extent of any erosion, grooving, bulging, warping, cracking or similar condition. Report on any defective rivets, bowed, loose or broken stays. State condition of all tubes, tube ends, coils, nipples, etc. Describe any adverse conditions with respect to pressure gage, water column, gage glass, gage cocks, safety valves, etc. Report condition of setting, linings, baffles, supports, etc. Describe any major changes or repairs made since last inspection.						
10	REQUIREMENTS: (LIST CODE VIOLATIONS)						
11	NAME AND TITLE OF PERSON TO WHOM REQUIREMENTS WERE EXPLAINED:						
	I HEREBY CERTIFY THIS IS A TRUE REPORT OF MY INSPECTION _____ SIGNATURE OF INSPECTOR			IDENT NO.	EMPLOYED BY		IDENT NO.

This form may be obtained from The National Board of Boiler and Pressure Vessel Inspectors, 1055 Crupper Ave., Columbus, OH 43229 NB-7 Rev. 4

NBIC Interpretation Draft

IN14-0701 - *Part 3 PWHT* - Subject: NBIC 2010, part 3, Post Weld Heat Treatment of a Vessel.

Q1. Must a company that performs post weld heat treatment be required to hold an "R" certification?
ANS: YES

Q2. Is this post weld heat treatment now considered an "Alteration" to this vessel, as per NBIC part 3?
ANS:
YES

Q3. Shall this "Alteration" be documented on a NBIC R-2 form? ANS: YES

Subject: NBIC 2010 Edition, Part 3, Post Weld Heat Treatment of a Vessel

Committee Question 1

An R-Certificate holder decides to perform post weld heat treatment (PWHT) of a vessel at the request of a client, where no PWHT was performed in the original construction. Is the performance of PWHT of the vessel considered an alteration and subject to documentation using a Form R2?

Reply: Yes.

Committee Question 2

For the vessel described above, must the weld procedures used for construction of the vessel be qualified with PWHT?

Reply: Yes.

Committee Question 3

Must the PWHT described above be performed by the R-Certificate holder?

Reply: No, the PWHT may be subcontracted; however the R certificate holder retains the responsibility for the performance of the PWHT.

Rationale: PWHT can reduce the mechanical properties and/or notch toughness of the original vessel material affecting the pressure retaining capability, which is the definition of an alteration in the NBIC.

PROPOSED INTERPRETATION

Inquiry No.	IN14-0801				
Source	William R Chalfant, PBF Energy, Delaware City Refinery				
Subject	**2013 NBIC , Part 3, Section 3.3.3 s) and 3.3.4.3.a)**				
Edition	2013				
Question	Question #1: 2013 NBIC, Part 3, Section 3.3.4.3.a) When performing weld metal buildup of wasted areas of pressure retaining items in accordance with NBIC Part 3, paragraph 3.3.4.3.a), is the interpretation that the final metal thickness (including base metal and weld metal build up) shall be the calculated minimum required thickness in accordance with the original Code of Construction plus any future corrosion allowance for the desired remaining life? Question #2: 2013 NBIC, Part 3, Section 3.3.3, paragraph s) When replacing a part on a pressure retaining item in accordance with NBIC Part 3, paragraph 3.3.3.s), is it the intent of the term "minimum required thickness" to mean nominal wall thickness minus corrosion allowance as shown on the original Manufacturer's Data Report?				
Reply	Reply #1: Yes. Reply #2: Yes.				
Committee's Question	**Question #1: 2013 NBIC, Part 3, Section 3.3.4.3 a)** **When performing weld metal buildup of wasted areas of pressure retaining items, is the wall thickness required to be restored to the thickness listed on the Manufacturers Data Report?**				
Committee's Reply	**Reply #1: No. The minimum thickness after build-up shall be the original thickness of the pressure retaining item minus the corrosion allowance.**				
Rationale	**See Below.**				
SC Vote	Unanimous	No. Affirmative	No. Negative	No. Abstain	No. Not Voting
NBIC Vote	Unanimous	No. Affirmative	No. Negative	No. Abstain	No. Not Voting

Negative Vote Comments	

Reference:

2013 NBIC Part 3, Section 3.3.3 s): s) 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.*

2013 NBIC Part 3, Section 3.3.4.3.a)

a) Shells, Drums, Headers

Wasted areas in stayed and unstayed shells, drums, and headers may be built up by welding, provided that in the judgment of the Inspector the strength of the structure has not been impaired. Where extensive weld buildup is employed, the Inspector may require an appropriate method of NDE for the completed surface of the repair. For suggested methods of building up wasted areas by welding. (See NBIC Part 3, Figure 3.3.4.3-a).

Rationale:

ASME Section VIII, Division 1 references:

MANDATORY APPENDIX 3 DEFINITIONS

3-2 DEFINITIONS OF TERMS

thickness of vessel wall:

(a) design thickness: the sum of the required thickness and the corrosion allowance (see UG-25).

(b) required thickness: that computed by the equations in this Division before corrosion allowance is added (see UG-22).

(c) nominal thickness: except as defined in UW-40(f) and modified in UW-11(g), the nominal thickness is the thickness selected as commercially available, and supplied to the Manufacturer. For plate material, the nominal thickness shall be, at the Manufacturer's option, either the thickness shown on the Material Test Report {or material Certificate of Compliance [UG-93(a)(1)]} before forming, or the measured thickness of the plate at the joint or location under consideration.

1.4 ACCREDITATION

a) Organizations performing repairs or alterations to pressure-retaining items shall be accredited as described in this section, as appropriate for the scope of work to be performed.

b) Organizations performing repairs outside the scope of the NBIC may be accredited and shall meet any additional requirements of the Jurisdiction where the work is performed.

1.5.1 ACCREDITATION PROCESS

a) The National Board administers accreditation programs for authorization of organizations performing repairs and alterations to pressure-retaining items in accordance with NB-415 and/or pressure relief valves in accordance with NB-514. ADD FOOTNOTE FOR NB-415 AND NB-514 SHOWING COPIES CAN BE OBTAINED AT http:www.nationalboard.org

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b) Any organization may apply to the National Board to obtain a *Certificate of Authorization* for the requested scope of activities. A review shall be conducted to evaluate the organization's quality system. The individual assigned to conduct the evaluation shall meet the qualification requirements prescribed by the National Board. Upon completion of the evaluation, any deficiencies within the organization's quality system will be documented and a recommendation will be made to the National Board regarding issuance of a *Certificate of Authorization*.

c) As part of the accreditation process, an applicant's quality system is subject to a review. National Board procedures provide for the confidential review resulting in recommendations to issue or not issue a *Certificate of Authorization*.

d) The accreditation programs provide requirements for organizations performing repairs and alterations to pressure-retaining items. ~~Depending upon the expected scope of activities at the time of review, organizations may be authorized to perform design only, metallic or non-metallic repairs, and/or alterations either in the shop only, field only, or shop and field. Repairs and/or alterations to metallic and non-metallic pressure-retaining items are made by welding, bonding and/or mechanical assembly.~~

~~e) Organizations desiring to renew or obtain a National Board *Certificate of Authorization* shall apply to the National Board using forms obtained from the National Board. Application for renewal shall be made prior to the expiration date of the *Certificate of Authorization*.~~

~~f)~~e) ~~When an organization has plants or shops in more than one location, the organization shall submit separate applications for each plant or shop.~~ The organization may perform repairs or alterations in its plants, shops, or in the field, provided such operations are described in the organization's Quality System.

~~g)~~f) The Jurisdiction[2] ~~m~~, as defined in Part 3, Section 9, may audit the Quality System and activities of an organization upon a valid request from

~~2 Jurisdiction: The National Board member jurisdiction where the organization is located. Alternatively, where the Jurisdiction elects not to~~

an owner, user, inspection agency, or the National Board.

~~h)~~g) The NBIC Committee may at any time change the rules for the issuance of Certificates of Authorization and use of the "R" Symbol Stamp. These rules shall become binding on all certificate holders.

1.5.2 NATIONAL BOARD "R" SYMBOL STAMP

~~a) All "R" Symbol Stamps shall be obtained from the National Board of Boiler and Pressure Vessel Inspectors. Authorization to use the "R" Symbol Stamp may be granted by the National Board at its absolute discretion to the certificate holder.~~

~~b)~~a) The "R" Symbol Stamp is furnished on loan by the National Board for a nominal fee. ~~Each organization shall agree if authorization to use the "R" Symbol Stamp is granted, that the "R" Symbol Stamp is at all times the property of the National Board and will be promptly returned upon demand. If the organization discontinues the use of the "R" Symbol Stamp, inspection agreement with an Authorized Inspection Agency, or if the Certificate of Authorization has expired and no new certificate has been issued, the "R" Symbol Stamp shall be returned to the National Board.~~

~~c)~~b) ~~The organization's Quality System shall provide for adequate control of the "R" Symbol Stamp.~~ Provisions may be made for the issuance of the "R" Symbol Stamp for use at various field locations.

d) ~~The holder of a Certificate of Authorization may obtain more than one "R" Symbol Stamp provided the organization's Quality System describes how the use of such stamps is controlled from the location shown on the certificate.~~

e) ~~An organization shall not permit others to use the "R" Symbol Stamp loaned to it by the National Board.~~

c) Additional requirements shall be met in accordance with NB-415 and/or NB-514 as applicable.

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1.6 QUALITY SYSTEM

A holder of a National Board Certificate of Authorization shall have and maintain a written Quality System. The System shall satisfactorily meet the requirements of the NBIC and shall be available for review. The Quality System may be brief or voluminous, depending on the projected scope of work. It shall be treated confidentially by the National Board.

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

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

a) **Title Page**

The name and complete address of the company to which the National Board *Certificate of Authorization* is issued shall be included on the Title Page of the Quality System Manual.

b) **Contents Page**

~~perform the review or where there is no Jurisdiction or where the Jurisdiction is the organization's Authorized Inspection Agency, the National Board of Boiler and Pressure Vessel Inspectors will represent the Jurisdiction. At the Jurisdiction's discretion, the Jurisdiction may choose to be a member of the review team if the Jurisdiction chooses not to be the team leader.~~

The manual should contain a page listing the contents of the manual by subject, number (if applicable), and revision number of each document.

c) **Scope of Work**

The manual shall clearly indicate the scope and type of repairs or alterations the organization is capable of and intends to carry out.

d) **Statement of Authority and Responsibility**

A dated *Statement of Authority*, signed by an officer of the organization, shall be included in the manual. Further, the *Statement of Authority* shall include:

1) A statement that all repairs or alterations carried out by the organization shall meet the requirements of the NBIC and the Jurisdiction, as applicable;

2) A statement that if there is a disagreement in the implementation of the Quality System, the matter is to be referred for resolution to a higher authority in the company;

3) The title of the individual who will be responsible to ensure that 1) above is followed and has the freedom and authority to carry out the responsibility.

e) **Manual Control**

The manual shall include the necessary provisions for revising and issuing documents to keep the manual current. The title of the individual authorized to approve revisions shall be included in the manual. Revisions must be accepted by the Authorized Inspection Agency prior to issuance of the manual and its implementation.

f) **Organization**

An organizational chart shall be included in the manual. It shall include the title of the heads of all departments or divisions that perform functions that can affect the quality of the repair or alteration, 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.

g) **Drawings, Design and Specifications**

The manual shall contain controls to ensure that all design information, applicable drawings, design calculations, specifications, and instructions are prepared or obtained, controlled, and interpreted in accordance with the original code of construction.

h) **Repair and Alteration Methods**

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

i) **Materials**

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

j) **Method of Performing Work**

The manual shall describe the methods for performing and documenting repairs and alterations in sufficient detail to permit the Inspector to determine at what stages specific inspections are to be performed. The method of repair or alteration must have prior acceptance of the Inspector.

k) **Welding, NDE and Heat Treatment**

The manual shall describe controls for welding, nondestructive examination, and heat treatment. The manual is to indicate the title of the individual(s) responsible for the welding procedure specification (WPS) and its qualification, and the qualification of welders and welding operators. It is essential that only welding procedure specifications and welders or welding operators qualified, 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 proficiency as required by the NBIC, while engaged in the repair or alteration of pressure-retaining items. The manual 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. Similar responsibility for nondestructive examination and heat treatment shall be described in the manual.

l) **Examinations and Tests**

Reference shall be made in the manual for examinations and tests upon completion of the repair or alteration.

m) **Calibration**

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

n) **Acceptance and Inspection of Repair or Alteration**

The manual shall specifically indicate that before the work is started, acceptance of the repair/alteration shall be obtained from an Inspector who will make the required inspections and confirm NBIC compliance by signing and dating the applicable NBIC Report Form [3] upon completion of the work.

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

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

o) **Inspections**

The manual shall make provisions for the Inspector to have access to 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 shall be available to the inspector.

p) **Report of Repair or Alteration Form**

The manual shall indicate the title of the individuals responsible for preparing, signing, and presenting the

NBIC Report Forms to the Inspector. The distribution of the NBIC Report Forms[3] shall be described in the manual.

q) **Exhibits**

Any forms referenced in the manual shall be included. The form may be a part of the referencing document or included as an appendix. For clarity, the forms may be completed and identified as examples. The name and accepted abbreviations of the "R" Certificate Holder shall be included in the manual.

r) **Construction Code**

The manual shall include provisions for addressing the requirements that pertain to the specific construction code for the equipment being repaired or altered.

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.

t) **Records Retention**

The quality manual shall describe 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 describe the scope of work completed to a pressure-retaining item (PRI), and documented on a Form "R" report.

2) Records 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.

3) The record retention schedule described in the Quality System Manual is to follow the instructions identified in NBIC Part 3, Table 1.6.5.1.

Table 1.6.5.1

Form "R" Reports, Records, or Documents	Instructions	Minimum Retention Period
a) Form "R" Reports and supporting records and documentation	The organization performing repairs and alterations shall retain a copy of the completed "R" Form report on file, and all records substantiating the summary of work described in NBIC Part 3, 5.13.4.1, Item 12, for a minimum of 5 years. When the method of repair described in NBIC Part 3, 3.3.4.8 is used, the record retention period shall be described in b)	5 years

~~3~~2 NBIC Report Form: National Board Form R-1 for Repair, Form R-2 for Alterations, Form R-3 for Fabricated Parts, or Form R-4 Report Supplementary Sheet.

b) Form “R” Report with REPORT OF FITNESS FOR SERVICE ASSESSMENT FORM (NB-403) attached.	When the method of repair described in NBIC Part 3,3.3.4.8 is used, the record retention period shall be for the duration described on the FITNESS FOR SERVICE ASSESSMENT (FFSA) Form required by the repair method and as described in NBIC Part 2, 4.4 Notes: 1. The “R” Certificate Holder should be aware that when used, some of the referenced codes and standards identified in NBIC Part 2,, 1.3 describe requirements for permanent record retention throughout the service life of each equipment item. 2. When the “R” Certificate Holder is not the owner or user of the equipment, the record retention period is limited to the FFSA-results described on line 8 of the Report of Fitness for Service Assessment Form (NB-403)	5 years or as described on line 8 as reported on Form NB-403; whichever period is longer
c) Continuity records for a welder, welding operator, bonder, or cementing technician	Minimally, continuity records for a welder, bonder, or cementing technician within the Certificate Holder’s quality system shall be described and established at the time of the applicant’s initial certificate review and demonstrated at each triennial review required thereafter.	As applicable to the scope of work identified on the Certificate of Authorization, the continuity records are subject to review during each National Board triennial certificate review.
d) Administrative record review of the “R” Certificate Holder’s administrative processes.	Records supporting completed administrative reviews or audits of procedures or processes required by the “R” Certificate Holder’s Quality System Manual, or in combination with the applicable part of the NBIC Part 3, Supplementary Section 6 as it applies to the identified scope listed on the “R” Certificate of Authorization.	Subject to review during the triennial evaluation of the certificate holder’s Quality System.

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SG- Repairs and Alterations action on 7/14/15, Voted (with Edwards and Galanes abstaining) to approve this revision to Part 3, 3.3.2 c)

Revised Proposal:

c) When ASME is the original code of construction, replacement parts subject to internal or external pressure fabricated by welding, which require inspection by an Authorized Inspector shall be fabricated by an organization having an appropriate ASME *Certification of Authorization*. The item shall be inspected and stamped as required by the applicable section of the ASME Code. A completed ASME *Manufacturer's Partial Data Report* shall be supplied by the manufacturer;

ASME stamping and completion of an ASME Manufacturer's Partial Data Report is not required for parts fabricated by the "R" Certificate Holder that will be used on pressure retaining items being repaired or altered by the same "R" Certificate Holder. The controls for this activity shall be described in the quality control system.

The "R" Certificate Holder; using replacement parts fabricated and certified to an ASME Code edition and addenda different from that used for the original construction, shall consider and seek technical advice where appropriate, for change or conflicts in design, materials, welding, heat treatment, examinations and tests to ensure a safe repair/alteration is performed. Note that work once classified as a repair could now be considered an alteration;

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Response to Letter Ballot of February 2015

Commenter	Comment / Negative	Response
Brian Boseo	I disapprove. After further consideration, I am falling back on my original stance. I do see merit in allowing an "R" Certificate holder to adjoin material together to support the Repair/Alteration of a pressure retaining item. However, when dealing with the repair/alteration of a boiler which can be made up of many larger pressure parts (e.g. headers, drums), this issue becomes clouded as I am not confident all "R" Certificate Holders maintain the technical expertise to manufacturer a major ASME Section I pressure part, especially when working to a different Edition/Addenda than what was used during original construction of the boiler. I agree with George Galanes and find merit in Mike Webb's proposed approach. BOSEO 3/12/15	The proposal has been reworked to require the R stamp holder to hold an ASME Certificate and have the work inspected by an AI. The only real change to the Code, in effect, is how the work is documented. The new version is included herein. RVW 07/12/15
Rob Troutt	While I agree this issue needs better clarity, I do not agree with the proposal. I have always had concerns with this part of the NBIC. Back when I was an Authorized Inspector, with Hartford, I found it odd that a R stamp holder could basically replace components of a vessel and not have the applicable ASME Code Stamp that the vessel was fabricated under. One of the problems that I have with the proposal is that it is addressing	See response to Brian Boseo. The proposal is now limited to being performed by someone with and ASME Code mark and the work is inspected by an AI. With regard to inclusion of alteration, the R stamp holder, today, does not need to go to an ASME stamp holder to approve any design or fabrication for an alteration. They MUST have this feature in the scope of their own R Certificate. RVW 0712/15

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Commenter	Comment / Negative	Response
	both repairs and alterations. I am not be concerned with a R stamp holder to fabricate a part of a vessel if it is fabricated with the same design of the part it was replacing (i.e. Same material, same thickness and so on). This by definition is a repair. Now if a R stamp holder is fabricating that part, but there is design changes, this is an alteration and now that part should be fabricated by someone holding the applicable ASME Code Certification Mark. I would like to make it clear, I am not saying that a R stamp holder should not be able to make alterations. Instead, I am saying if a "Part" is being fabricated as part of a alteration, then that part should be built to the applicable ASME Code of Construction for which it will be installed on. TROUTT 3/7/15	
Michael Webb	Disapprove. I am clearly in favor of this item to better profile "R" Certifcate holder activities. However, in my opinion the confusing elements of replacement parts may be better clarified by separating the Part 3 – 3.3.2 c) paragraph into 3 items of distinct context. To address this opinion the attached is offered to the subcommittee for their consideration. WEBB 02/19/15 (NOTE: Webb negative withdrawn) To ensure my favorable opinion of this item is counted, I change my vote accordingly. Setting my opinion of the 3.2.2 –c) paragraph format and wording aside, comments voiced by Mr. Morelock and Mr. Schulte are well stated and are in concert with the routine vigilance and "monitoring" of a repair organization's activities by the AIA, an expectation of the National Board. The introduction of material into a repair or alteration is an in-process, Quality System-control, for which	Thank you for support. And thank you for your additional thoughts on this issue. I have reworded the proposal to take some of your idea into consideration. Please see the attached new proposal. RVW 07/12/15

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Commenter	Comment / Negative	Response
	the holder of a "R" Certificate of Authorization has been dutifully reviewed and accepted by the AIA and national Board. For those users whose experience in the use of the Code has not been patiently augmented by committee meeting participation, the opportunity to mentor is well within the prerogatives of the AIA to better institute other controls as necessary. WEBB 3/4/15	
Brian Morelock	I understand the reasoning for the negatives, but I feel this item has merit and I approve it. Yes, we will need to agree on the wording. This item states, "The controls for this activity shall be described in the quality control system". For the purposes listed in this item, it really boils down to this: an "R" stamp holder can carry out ASME Code materials into the field, weld them, inspect them, perform NDE, and test them as a repair, but if this same "R" stamp holder would want to use the same ASME Code materials, same qualified WPS's, same qualified welders, same inspection, same NDE, etc. in their shop to preassemble this material as a "component" (as stated in this item) prior to installation in the field, this "R" stamp holder must now also have a ASME stamp strictly based upon how the materials are staged prior to welding? MORELOCK 3/3/15	Thank you for your support on this. I have revised the proposal that requires the R stamp holder to have an ASME Code mark if he is going to fabricate ASME parts. Please see revised proposal attached. RVW 07/12/15
Paul Edwards	Mr. Galanes' review is well stated, I concur with his concerns on this proposal. EDWARDS 3/2/15	Please see response to Mr. Galanes. RVW 07/12/15
Wayne Jones	The term "Part" is recognized by ASME while NB-23 refers to "Pressure Retaining Item". During my participation with Joint Reviews he was made clear that ASME does not recognize the term "pressure retaining item". Maybe we should take a look	The term "part" is used throughout the NBIC without definition. In this paragraph, we are dealing with "replacement" parts. There may be some value to defining that term better in the NBIC since it usually means "like-for-like". But not always. For this action, I do not think it will help very

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Commenter	Comment / Negative	Response
	at using this term which would provide clarification when the R stamp holder needs to fabricate a replacement. JONES 2/26/15	much. At the next meeting, I will bring this topic up for discussion and if the committee feels that it should be better defined, an item will be opened to do so. RWV 07/12/15
Brian Schulte	I approve. I believe the additional language provides clarification, however review and acceptance by the AI is the key to precluding Mr. Galanes' concern about abuses by less than sophisticated R stamp holders with no design or fabrication expertise. SCHULTE 2/26/15	Thank you for your support. RVW 07/12/15
George Galanes	I am voting disapprove because if we allow R-Certificate holders to fabricate ASME pressure parts for repairs or alterations even when the parts are installed by the same R-Certificate holder, where does this card blanche end? I am still wrestling with the concept if we need to place restrictions on what an R-Certificate holder can fabricate regarding type of pressure parts, similar to examples for repairs and alterations. For those that cited previous examples, like roll forming a shell and seam welding the formed shell into an existing pressure retaining item (repair) or fabricating butt welds in boiler tube dissimilar metal welds, these are fabricated pressure parts that can be supplied by a typical R-Certificate holder. What I am most concerned about are abuses by less sophisticated R-Certificate holders trying to reverse engineer ASME pressure parts, like headers or steam drums with no design or headers or steam drums with no design or fabrication expertise. I am not sure that stating "controls for the activity shall be described within the quality control system" will be definitive. The current wording in Part 3. 3.2.2 clearly states pressure parts shall be	Take note that this activity of R stamp holders fabricating ASME parts has been going on in industry for as long as I can remember. Typical examples are butt welding tubing together before installing the completed tube as a replacement tube in utility boilers, or welding LWN flanges to pipe pieces to form spools for installation in the pressure vessel, or assembling spool pieces on the shop floor to be installed in BEP in the field. All this has typically been performed by an R stamp holder, with the inspection being performed by the NB Commissioned Inspector, and the work recorded on R-1 forms. The "roll forming a shell and seam welding" that you mentioned is another typical part fabricated by an R stamp holder. Same for making dissimilar tubing welds. These are the types of fabrication that is intended in this proposal. As far as reverse engineering pressure parts, that is also done today to some extent, and is pretty much sanctioned by the NBIC, i.e. supplying like-for-like replacement parts. In fact, there is no engineering performed there. So I'm not sure what having an ASME stamp will do in that scenario. However, to respond to your negative, I added the rule that to fabricated

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Commenter	Comment / Negative	Response
	fabricated by an ASME Certificate holder. I believe, this wording was intentional by the NBIC main committee at the time it was incorporated into the NBIC to avoid having an R-Certificate holder assuming design and fabrication responsibility for another code's pressure part. Simply adding another paragraph seems to provide an alternative approach where shall was originally used to express the intent that fabricated pressure parts will be designed and fabricated to the original code of construction (ASME) regardless of size and function. I am very sympathetic to allowing an R-Certificate holder to fabricate limited ASME pressure parts under their control including installation. If we, as a group collectively, decide to go down the path of allowing an R-Certificate holder to fabricate pressure parts under their control during repair or alteration, we should state that and eliminate 3.2.2 (c) or eliminate shall to allow flexibility. GALANES 2/19/15	parts, the R stamp holder must hold an ASME Code mark. To address your concern about not being definitive enough in the QC System, the revised proposal includes some additional specificity of what needs to be included in the QC system. This additional text is in line with what ASME requires for transfer of parts between ASME stamp holder locations without supplying a Data report or stamping the part. With regard to the comment about what was originally intended by the Code Committee when the words were included, I agree with you. That is exactly what they intended. But it was intended for organizations that were designing and supplying Parts to the R stamp holder. But regardless, this new proposal will require the R stamp holder to hold an ASME mark as well. I think we already allow this fabrication methodology to exist today. The only part that needs clarification is how it is documented. Which is the only intent of this action. I do not believe that we should eliminate 3.2.2 c) since it the heart of the matter, and provides much needed rules to control how replacement parts are treated. With regard to stopping abuse of this, I don't think R stamp holders will generally replace complete drums RVW 07/12/15

Attachment Page 69

NB15-0509; PR15-0156

NBIC Part 3 paragraph: 2.5.3.6 c) 5) d)

d) The filler metal shall be limited to an austenitic, nickel-base filler metal having a designation F-No. 43 and limited to the following consumables: ERNiCr-3 (e.g. Filler Metal 82), ENiCrFe-3 (e.g. INCONEL Welding Electrode 182), ENiCrFe-2 (e.g. INCO-WELD A), ASME B&PV Code Cases 2733 and 2734 (e.g. EPRI P87).

Attachment Page 69

Item NB15-1402

Single Strike-through and single underline: Comments/edits by Walt Sperko and Nathan Carter including NBIC Items 15-0509 and Nb15-1403 from January 2015 NBIC meeting in Orlando, FL

Double Strike-through and double underline: Proposed edits by EPRI

2.5.3.6 Welding Method 6

This welding method provides ~~guidance~~ requirements for welding only Grade 91 tube material within the steam boiler setting and when ~~it's~~ it is impracticable to perform local post-weld heat treatment (PWHT). ~~This repair method utilizes a controlled fill technique.~~ When using this welding method, the following ~~is required~~ apply:

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

(2) Application shall be limited to only boiler tube repairs at a location internal to the boiler setting.

~~(3) Upon the completion of weld repair, the repair region shall be kept from humid or moist environments until the return to service~~. Upon completion of weld repair, the repair area shall be kept above the dew point temperature so that condensation does not form on the repair surface before returned to service or a moisture-barrier coating shall be applied to the surface.

(a) The material shall be limited to P-No 15E, Group 1, Grade 91, creep strength enhanced ferritic steel (CSEF).

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

(c) The ~~test material for the~~ welding procedure qualification test coupon shall be P-No 15 E, Group 1, Grade 91 ~~for the repair.~~

(d) Qualification thickness limits of base metal and weld deposit thickness ~~for the test plates and repair groove depths~~ shall be in accordance with ASME Section IX, QW-451.

(e) The Welding Procedure Specification (WPS) shall be qualified in accordance with the requirements of ASME Section IX., ~~except that no~~ No postweld heat treatment shall be applied to the test coupon. Additionally, the ~~qualification~~ WPS shall include the following requirements;

1) The minimum preheat for the GTAW process shall be 200 deg F (~~93~~100 deg C). The minimum preheat for the SMAW process shall be 300 deg F (150 deg C). The preheat temperature shall be checked to ensure the minimum preheat temperature is maintained during welding and until welding is completed. The maximum interpass temperature shall be ~~400 deg F (200 deg C).~~ 550 deg F (290 deg C).

(2) When the SMAW process is specified for a fill pass layer ~~as a controlled filled welding technique,~~ the electrode diameter is restricted to a maximum size of 1/8 in. (3.2 mm). When the GTAW-process is specified, any limits in filler size is to be ~~reflected in the qualified PQR and~~ shown on the WPS.

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

(4) The filler metal shall be limited to an austenitic, nickel-base filler metal having a designation F-No. 43 and limited to the following consumables: ERNiCr-3 (e.g., Filler Metal 82), ENiCrFe-3 (e.g., INCONEL Welding Electrode 182), ENiCrFe-2 (e.g., INCO WELD A), ASME B&PV Code Cases 2733

Comment [SJ1]: George, please fill in

Comment [GG2]: The words in blue were revised based on approval of item NB15-1402.

Comment [GG3]: The highlighted blue was revised under another action NB15-0509.

and 2734 (e.g., EPRI P87) or
(5) A martensitic, iron-base filler metal having a designation F-No. 4 or F-No. 6 and limited to the following consumables: E8015-B8, E8018-B8 or ER80S-B8.

NB15-1403
NBIC Part 3 PROPOSED SUPPLEMENT

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Supplement X

WELD REPAIR AND POST REPAIR INSPECTION OF CREEP STRENGTH ENHANCED FERRITIC STEEL

SX.1 SCOPE

The technical information provided in this supplement pertains to weld repair options and post repair inspection guidelines which can be used for creep strength enhanced ferritic steels (CSEF).

Creep Strength Enhanced Ferritic alloys (CSEF's) are a family of ferritic steels whose creep temperature strength is enhanced by the creation of a precise condition of micro-structure, specifically martensite or bainite, which is stabilized during tempering by controlled precipitation of temper-resistant carbides, carbo-nitrides, or other stable and/or meta-stable phases. Careful consideration shall be given to pressure-retaining items that are fabricated from CSEF's. The behavior of these materials in low temperature (i.e. fracture toughness and/or fatigue) and in high temperature (i.e. creep and/or creep-fatigue) components can be degraded by not adhering to provided welding procedures and improper application of post-weld heat treatment (PWHT).

During service, weld repairs to CSEF can occur which may not be conducive to weld repairs following original construction fabrication requirements regarding post weld heat treatment (PWHT) and repair weld joint design. This supplement provides guidelines for alternative weld repair options and post repair inspection using a well-engineered approach for CESF steels. The user is cautioned to seek technical guidance for welding and heat treating requirements and attention should be made to temperature cycles required to achieve the micro-structures beyond preheat and post weld heat treatment requirements specified from the original code of construction. A key document that should be solicited in the development of weld repair procedures is:

Comment [GG1]: John;
I don't believe this statement would fly with NBIC committee members. We do not endorse publications other than other Codes and Standards.

SX.2 WELD REPAIR OF GRADE 91 STEEL

SX.2.1 Alternative Weld Repair Options

SX.2.1.1 9Cr-1Mo-VNbN Filler Metal (i.e. matching to Grade 91) + Controlled Fill + Low PWHT (Minimum temperature is 1250°F, 675°C). Acceptable filler materials are referenced in Table 1. The minimum time and maximum heat treatment temperature shall be referenced by the original code of construction.

For reference, where the Ni+Mn content of the filler metal *is not known*, ASME B&PV Code restricts the maximum PWHT temperature to 1425°F (775°C). As general best practice, this maximum should be enforced to avoid over-tempering or exceeding the absolute maximum PWHT temperature. Rules, as specifed by ASME B&PV Code Section I or ASME B31.1 for PWHT are provided below with regard to the required minimum hold time for PWHT.

a. Minimum holding time at PWHT temperature is specified as 1 hour per 1.0 inch (25 mm) of thickness, 30 minute minimum provided the component < 0.5 inches (12.5 mm) in thickness;

b. Minimum holding time at PWHT temperature is specified as 5 hours plus 15 minutes for each additional 1.0 inch (25 mm) over 5.0 inches (125 mm);

SX.2.1.2 9Cr-1Mo Filler Metal + Controlled Fill and No PWHT. Acceptable filler materials are detailed in Table 1.

SX.2.1.3 Ni-base Filler Metal + Controlled Fill and No PWHT. Acceptable nickel base consumables include selected ASME F No. 43 filler metals as detailed in Table 1.

Table 1. Alternative Weld Repair Methods, Filler Metals and Welding Processes for Grade 91 Steel.

Acceptable Weld Repair Method		Welding Process and Filler Metal AWS Classification
Filler Metal	**Welding Procedure**	
Matching (9Cr-1Mo-VNbN)	Controlled Fill + Low PWHT	• SMAW – E9015-B9 or E9015-B91[A] • FCAW – E91T1-B9 • GTAW – ER90S-B9 or ER90S-B91[A]
9Cr-1Mo	Controlled Fill	• SMAW – E8015-B8 • FCAW – E81T1-B8 • GTAW – ER80S-B8
Ni-base	Controlled Fill	• SMAW – EPRI P87[B], ENiCrFe-2, ENiCrFe-3 • FCAW – None available • GTAW – EPRI P87[C], ERNiCr-3

[A] –B91 AWS classification is pending for the various Grade 91 filler metal product forms (currently –B9)
[B] Incorporated by ASME B&PV Code as Code Case 2734 for classification as an F No. 43 filler material
[C] Incorporated by ASME B&PV Code as Code Case 2733 for classification as an F No. 43 filler material

SX.2.2 Application of Controlled Fill Welding Procedure

SX.2.2.1 The minimum preheat for the repair procedure shall be 300 deg F (150 deg C). The preheat temperature shall be checked to ensure the minimum preheat temperature is maintained during welding and until welding is completed. The maximum interpass temperature shall be 550 deg F (290 deg C).

SX.2.2.2 In general, to control heat input, it is recommended to weld the excavation using a "controlled fill" technique. In this technique, the first layer in contact with the machined excavation can be identical or smaller in diameter than the fill passes.

SX.2.2.3 The bead-to-bead overlap should be ~50% or greater. The fill passes should be deposited working from the bevel towards the center of the excavation with a minimum overlap of 25% and ideally 50%. As a rule of thumb, if the welder aims for the toe of the previously deposited weld bead, an overlap of at least 40% will be achieved.

SX.2.2.4 For ferritic filler materials, and when the SMAW process is specified for a fill pass layer as a controlled fill welding technique, the electrode diameter is restricted to a maximum size of 1/8" (3.2 mm). When the GTAW process is specified, any limits in filler size is to be reflected in the qualified PQR and WPS.

SX.2.2.5 For ferritic filler materials, and when the SMAW process is specified for a fill pass layer as a controlled fill welding technique, the electrode diameter is restricted to a maximum size of 5/32" (4.0 mm). For weld beads in contact with the machined excavation. The maximum size shall be restricted to 1/8" (3.2 mm). When the GTAW process is specified, any limits in filler size is to be reflected in the qualified PQR and WPS.

Notes:

1. *The excavation should have rounded corners to prevent lack of fusion. It may be advisable to use a smaller diameter electrode (such as 2.5 mm or 3/32 in.) to ensure good tie in.*
2. *The step should be machined at least 10 mm beyond the fusion line of the original weld*
3. *The fill passes along the bevel should be restricted in height so as to not reduce access to the bottom of the excavation for the welder*

Additional Instructions:

- *The fill passes should be conducted working "outside-in", whereby the fill passes are first deposited on either side of the excavation and additional fill passes are deposited welding towards the center of excavation*
- *50% overlap is recommended for all welding passes either in contact with the bevel or fill*
- *Stringer beads only are recommended for all welding passes either in contact with the bevel or fill*
- *A 2.5 mm (3/32 in.) diameter electrode may be utilized for the weld passes in contact with the bevel but is not mandated nor required for acceptable performance*

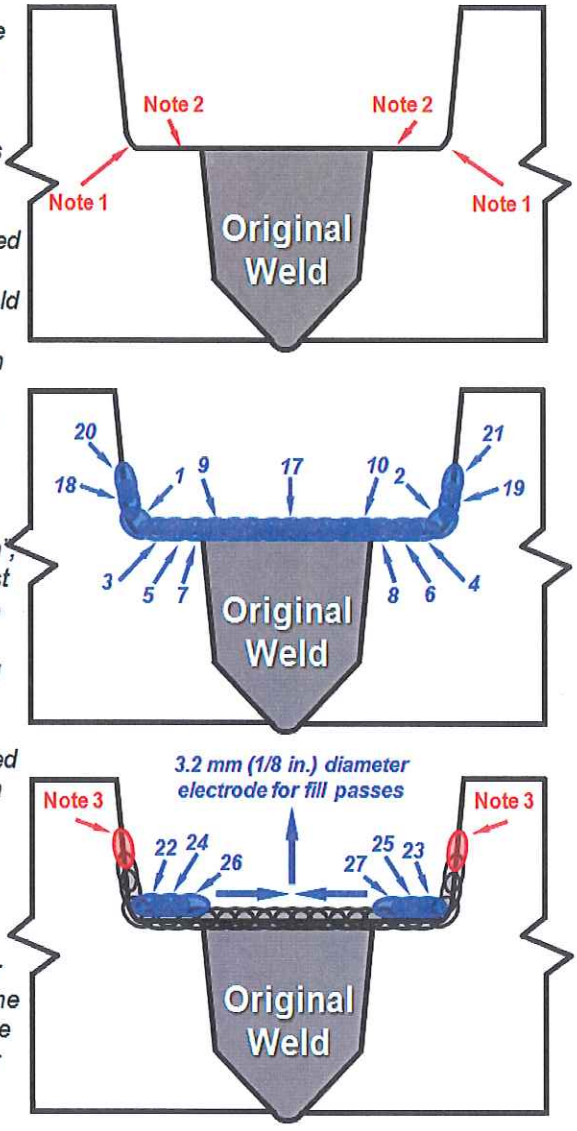


Figure 1. Schematic of the Controlled Fill Welding Procedure for Grade 91 Steel for a Partial Weld Repair of a Circumferential Girth Weld.

SX.2.3 Qualification of Controlled Fill Welding Procedure

SX.2.3.1 The test material for the welding procedure qualification shall be P-No 15E, Group 1, Grade 91 for the repair.

SX.2.3.2 Qualification thickness for the test plates and repair groove depths shall be in accordance with ASME Section IX, QW-451.

SX.2.3.3 The Welding Procedure Specification (WPS) shall be qualified in accordance with requirements of ASME Section IX. If a given procedure does not require post weld heat treatment, none shall be applied.

SX.2.3.4 For qualification of weld repair procedures using 9Cr-1Mo filler metal and in the as-welded condition, the requirements for the bend test shall be relaxed to a test which achieves a minimum of 14% in the outer fibers. Guidance is provided in ASME B&PV Code Section IX QW-466.1 which allows for base materials to be side bend tested that exhibit between 3 and less than 20% elongation values and should be referenced.

SX.3 POST REPAIR INSPECTION

X.3.1 After the completion of weld repairs to CSEF steels, post inspection requirements shall be developed and implement based on approval from the Inspection, and if applicable the Jurisdiction using a well-engineered approach.

X.3.2 Inspection method and intervals shall be developed to ensure safe operation and margin to locate and monitor defect growth in service. The selected non-destructive evaluation method shall have a minimum resolution to detect a flaw size of 0.125 inches (3.2 mm)

X.3.3 Post repair inspection shall not be considered a single event. A recommended base re-inspection interval is every other planned major outage or six years, whichever is less. The Owner/User may expand or compress the re-inspection interval based on trend results from previous inspections.

X.3.4 Where a hydro-test is mandated in lieu of NDE, the guidelines in NBIC NB-23 shall be followed. The water shall be heated to a temperature as recommended in the 2013 Edition of the NBIC Part 3, Table 4.4.2 to prevent risk of low temperature fracture for full penetration or near full penetration repair welds.

For NBIC Committee use only

The position paper links are available below for download:

1. A Well-Engineered Approach for Establishing the Minimum Allowable Post-Weld Heat Treatment for Power Generation Applications of Grade 91 Steel

http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000003002005350

2. A Perspective on the Selection of Preheat, Interpass, and Post-Weld Cool Temperatures Using Grade 91 Steel as an Example

http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000003002005351

3. The Benefits of Improved Control of Composition of Creep-Strength-Enhanced Ferritic Steel Grade 91

http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000003002003472

4. The Influence of Steel Making and Processing Variables on the Microstructure and Properties of Creep Strength Enhanced Ferritic (CSEF) Steel Grade 91

http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000003002004370

Guideline/Summary Documents

5. Best Practice Guideline for Well-Engineered Weld Repair of Grade 91 Steel

http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000003002003833

NB-15-1702 Revised at 15 July 2015 SC R&A meeting

S 1.2.5.1 Un-threaded Fillet-Welded Staybolts

Repairs to un-threaded fillet welded staybolts shall be performed in accordance with the original Code of construction. If the original Code of construction is not known, repairs shall be performed as follows in accordance with an appropriate code of construction that allows fillet welded staybolts:

a) The replacement of un-threaded fillet-welded staybolts is permissible.

b) Existing un-threaded fillet-welded staybolts that leak shall be repaired by re-welding after mechanically removing the entire weld. Only the leaking stays are to be re-welded.

c) Minor leakages (sweat pores) may be repaired by gently caulking the fillet weld, however identifiable cracks shall be repaired by re-welding.

Reference for information only: DEUTSCHE BAHN AG, Instruction for the Maintenance of the Steam Locomotive Boilers,
DS 991 99 05 (Dv 946 Part 1), Ed. 1st June 1994

NBIC Sub-Group Repairs & Alterations

Subject:	Leak tightness by seal welding a designed inspection or maintenance access opening

NB-Item number:	NB15-1801

Explanation of assignment needed:	Is it reasonable to add as a routine repair activity, the replacement of a seal weld when the pressure retaining item's design and leak tightness are derived in combination from using a seal weld of limited size?

Assigned to:	M. Webb

Background:	Inspection and maintenance openings are routinely designed to allow access to assess equipment condition and exercise maintenance activities in concert with reliability and safety. By design, pressure retention is assured by mechanical interface. By design, some openings include a seal weld to assure leak tightness and the weld is not considered to add strength or to enhance the item's pressure retaining capability. Routinely, the Manufacturer provides time-proven instruction for their replacement, routinely following the governing rules from the original code of construction, exempting the seal weld and weldment from PWHT and citing VT-examination throughout the installation, both within the established parameters of a routine repair. *See the Interpretations 07-10, 01-09, PCC-2, Article 2.3 (2011) on pg-2, and an example of Instructions on pg-3 supporting this proposed action as a routine activity …*

Current Wording:	NBIC, Part 3, paragraph 3.3.2 (e) items 1-4: *Not recognized currently as a routine repair.*

Proposal: ***double underline***	New paragraph 3.3.2. (e) 5): 5) Seal welding a mechanical connection for leak tightness where by-design, the pressure retaining capability is not contingent on the weld for strength and requires no PWHT. (B. Wiegoszinski's original proposal, 1-21-15: Seal welding of mechanical connections provided postweld heat treatment is not required by the Code of construction.")

NBIC Sub-Group Repairs & Alterations

INTERPRETATION 11-01

Subject: Part 3, 3.3.2

Edition: 2011

Question: In Part 3, 3.3.2 d), is the replacement scope or the number of valves, fittings, tubes, or pipe NPS 5 in diameter and smaller, or sections thereof, a consideration when determining if the work is a routine repair?

Reply: No. The NBIC does not address the magnitude of work or scope in qualifying repairs as routine but rather addresses the exceptions representing routine repairs as noted within Part 3, 3.3.2 d) 1).

INTERPRETATION 07-10

Subject: Part 3, 3.3.2 and 3.3.3

2007 Edition with 2009 Addendum

Question: Is it the intent of the NBIC that weld build-up of a damaged gasket surface on a flange where neither PWHT no NDT is required by the code of construction considered a routine repair?

Reply: Yes, provided the “R” Certificate Holder’s quality system program describes the process for identifying, controlling and implementing routine repairs.

INTERPRETATION 01-09

Subject: RC-2031(a)(1) Routine Repairs

1998 Edition with 2000 Addendum

Question: Is the seal welding of tubes which are five NPS in diameter and less considered a routine repair?

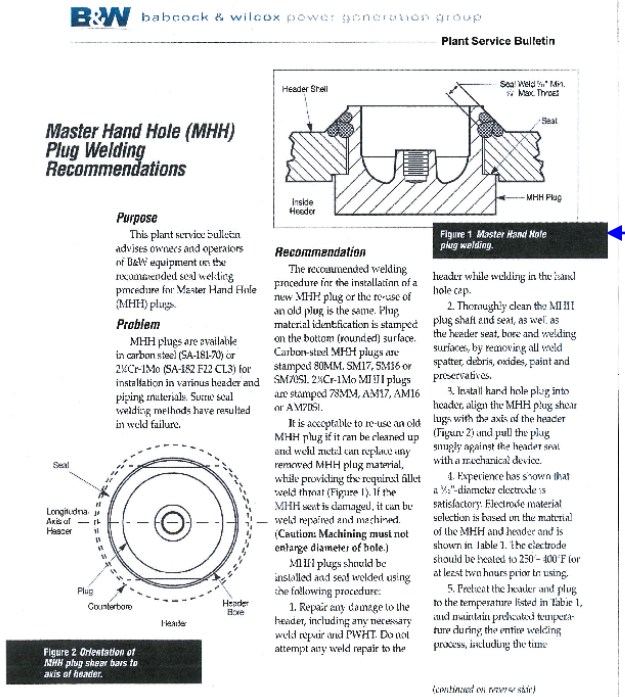
Reply: Yes.

NBIC Part-3,
3.2.6 REFERENCE TO OTHER CODES AND STANDARDS (can provide useful guidance)
(c) ASME PCC-2, Repair of Pressure Equipment and Piping-

ASME PCC-2, Article 2.3, (2011)- seal welded threaded connections and seal weld repairs
3.1 (a) The seal weld shall only be used to provide the hermetic seal, not the mechanical strength to the joint.

NBIC Sub-Group Repairs & Alterations

INSTRUCTION EXAMPLE:



B&W babcock & wilcox power generation group

Plant Service Bulletin

Master Hand Hole (MHH) Plug Welding Recommendations

Purpose

This plant service bulletin advises owners and operators of B&W equipment on the recommended seal welding procedure for Master Hand Hole (MHH) plugs.

Problem

MHH plugs are available in carbon steel (SA-181-70) or 2¼Cr-1Mo (SA-182 F22 CL3) for installation in various header and piping materials. Some seal welding methods have resulted in weld failure.

Figure 2 *Orientation of MHH plug shear bars to axis of header.*

Figure 1 *Master Hand Hole plug welding.*

Recommendation

The recommended welding procedure for the installation of a new MHH plug or the re-use of an old plug is the same. Plug material identification is stamped on the bottom (rounded) surface. Carbon-steel MHH plugs are stamped 80MM, SM17, SM16 or SM20SI. 2¼Cr-1Mo MHH plugs are stamped 78MM, AM17, AM16 or AM20SI.

It is acceptable to re-use an old MHH plug if it can be cleaned up and weld metal can replace any removed MHH plug material, while providing the required fillet weld throat (Figure 1). If the MHH seat is damaged, it can be weld repaired and machined. (**Caution: Machining must not enlarge diameter of hole.**)

MHH plugs should be installed and seal welded using the following procedure:

1. Repair any damage to the header, including any necessary weld repair and PWHT. Do not attempt any weld repair to the header while welding in the hand hole cap.

2. Thoroughly clean the MHH plug shaft and seat, as well as the header seat, bore and welding surfaces, by removing all weld spatter, debris, oxides, paint and preservatives.

3. Install hand hole plug into header, align the MHH plug shear lugs with the axis of the header (Figure 2) and pull the plug snugly against the header seat with a mechanical device.

4. Experience has shown that a ⅛"-diameter electrode is satisfactory. Electrode material selection is based on the material of the MHH and header and is shown in Table 1. The electrode should be heated to 250 - 400°F for at least two hours prior to using.

5. Preheat the header and plug to the temperature listed in Table 1, and maintain preheated temperature during the entire welding process, including the time

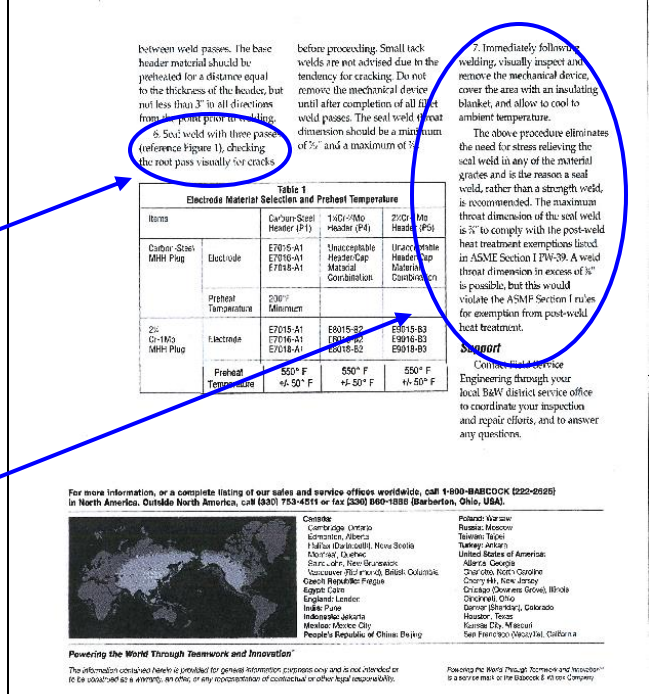
(continued on reverse side)

EXAMPLE:
Page 1 and 2 of instructions offered by Babcock & Wilcox for installing Master Hands Hold illustrating a seal weld of limited size;

"6. Seal weld with three passes (reference Figure 1) checking the root pass visually for cracks …The seal weld throat dimension should be a minimum of 5/16" and maximum of 3/8"."

"7. Immediately following welding, visually inspect…"

The above procedure eliminates the need for stress relieving the seal weld in any of the material grades and is the reason a seal weld, rather than a strength weld, is recommended. The maximum throat dimension of the seal weld is 3/8" to comply with the post-weld heat treatment exemptions listed in ASME Section I PW-39. "



between weld passes. The base header material should be preheated for a distance equal to the thickness of the header, but not less than 3" in all directions from the point prior to welding.

6. Seal weld with three passes (reference Figure 1), checking the root pass visually for cracks

before proceeding. Small tack welds are not advised due to the tendency for cracking. Do not remove the mechanical device until after completion of all fillet weld passes. The seal weld throat dimension should be a minimum of 5/16" and a maximum of 3/8"

7. Immediately following welding, visually inspect and remove the mechanical device, cover the area with an insulating blanket, and allow to cool to ambient temperature.

The above procedure eliminates the need for stress relieving the seal weld in any of the material grades and is the reason a seal weld, rather than a strength weld, is recommended. The maximum throat dimension of the seal weld is 3/8" to comply with the post-weld heat treatment exemptions listed in ASME Section I PW-39. A weld throat dimension in excess of 3/8" is possible, but this would violate the ASME Section I rules for exemption from post-weld heat treatment.

Support

Contact Field Service Engineering through your local B&W district service office to coordinate your inspection and repair efforts, and to answer any questions.

Table 1
Electrode Material Selection and Preheat Temperature

Items		Carbon-Steel Header (P1)	1¼Cr-½Mo Header (P4)	2¼Cr-1Mo Header (P5)
Carbon-Steel MHH Plug	Electrode	E7015-A1 E7016-A1 E7018-A1	Unacceptable Header/Cap Material Combination	Unacceptable Header/Cap Material Combination
	Preheat Temperature	200°F Minimum		
2¼-Cr-1Mo MHH Plug	Electrode	E7015-A1 E7016-A1 E7018-A1	E8015-B2 E8016-B2 E8018-B2	E9015-B3 E9016-B3 E9018-B3
	Preheat Temperature	550° F +/- 50° F	550° F +/- 50° F	550° F +/- 50° F

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Additional Background-pg-4

NBIC Sub-Group Repairs & Alterations

Initially presented by Bob Wielgoszinski, 1-21-15:
During the inspection activity of some high pressure header type boilers, it is necessary to remove handhole covers or handhole plugs to access the inside of the header for inspection of tubes. The subsequent closure of the handholes by reinstalling the handhole covers or plugs sometimes necessitates the cover or plug being seal welded to its seat.

The seal weld is solely for the purpose of preventing leakage at the seat. The strength of the connection is based on back pressure applied to the cover or plug from boiler internal pressure. This seal welding constitutes a repair by welding as defined in the NBIC, and therefore requires inspection by a NB Commissioned Inspector, completion of an R-1 form, and attachment of a repair nameplate by the R stamp holder.

This repair activity has been interpreted as a routine repair, which would allow for the NB Inspector to waive in-process inspection and rule out the attachment of a repair nameplate by the R stamp holder (if permitted by the Inspector and the Jurisdiction). It would still, of course, require the completion of an R-1 form for the work performed. Although this seal welding process seems inconsequential to the structural integrity of the boiler, the problem here is that this type of repair is not mentioned specifically in "the list of 4" categories allowed by the NBIC, Part 3, 3.3.2(e). In fact, seal welding is not mentioned at all for routine repairs, even though interpretation 01-09 specifically addresses it for seal welding of tubes. Also, interpretation 95-35 addresses seal welding of tubes and confirms that it is a repair.

So, as a result of this, it would be helpful to the industry if the NBIC Committee could provide an interpretation of the rules to address seal welding of handhole covers or plugs as a routine repair. And if the Committee were to determine that such a repair is permitted as a routine repair, then a revision to the rules to address it would be equally as helpful to the public. Included below is a proposed question and reply for an interpretation.

IN15-0101-
Subject: Seal welding of handhole covers
Question: Is seal welding of inspection opening covers, such as handhole plates or plugs, considered a routine repair in accordance with NBIC, Part 3, paragraph 3.3.2 (e)?
Reply: No.

If the Committee feels that a repair such as described herein SHOULD be considered as a routine repair, then I will offer the following revision to the NBIC to clarify it. If the Committee does not believe it should be considered as a routine repair, then no revision would be necessary since the interpretation confirms that it is not permitted.

(Proposed 1-21-15) New paragraph 3.3.2. (e) 5):
5) Seal welding of mechanical connections provided postweld heat treatment is not required by the Code of construction."

Request for NBIC Revision

Robert V. Wielgoszinski
Hartford Steam Boiler of CT

Purpose	To provide minimum radius dimension for corners of a flush patch
Scope:	Repairs and alterations to pressure retaining items that contain a flush patch, 3.3.4.6 a)2).
Background	In the performance of repairs by installation a flush patch, the treatment of the corners often becomes controversial because of the lack of specificity in the NBIC. The Code (Part 3 – 3.3.4.6 a)2), says in part, simply that "… If the patch is rectangular, an adequate radius should be provided at the corners. Square corners should be avoided…" The issue is the guidance "should be provided". Usually most R stamp holders provide an ample radius at these corners. A radius helps to avoid any undue stresses at the corner by eliminating a potential stress riser of a sharp right angle weld configuration. At a recent flush patch repair, it was reported that a radius was not provided and the subsequent pressure test revealed leaks at three of the four corners of the patch. Further investigation with LP examination discovered cracks at all three corners. This situation was clearly the result of poor application of the repair method, but could have been prevented by applying a radius at the corner, which was the corrective action in this case. So, the recommendation here is to revise the NBIC by requiring a minimum radius at corners of square or rectangular flush patches. A prescribed minimum, of say ½", would not cause any hardship on an R stamp holder that performs such repairs. And it does not preclude providing a larger radius if necessary. If there is a question of measurement, I also don't think this is a problem. A US quarter has about a ½" radius. UPDATE: 07/14/15: At the SG meeting it was pointed out that Supplement 1 of Part 3 already has some criteria for a minimum radius for patches in paragraph S1.2.11.2 d). This requires a 3x the plate thickness minimum radius. This is more conservative than ½". The SG voted to accept this revision with ½" changed to 3x the plate thickness.
Proposed Revision	Revise NBIC, Part 3, Paragraph 3.3.4.6 a) 2) to require a minimum of 3 times the plate thickness radius at the corners of square or rectangular flush patches. Before installing a flush patch, the defective material should be removed until sound material is reached. The patch should be rolled to the proper shape or curvature. The edges should align without overlap. In stayed areas, the weld seams should come between staybolt rows or riveted seams. Patches shall be made from a material whose composition and thickness meet the intended service. Patches may be any shape or size. If the patch is rectangular, an adequate radius ~~should~~ of at

	least 3 times the plate thickness shall be provided at the corners. Square corners ~~should~~ are not permitted. The completed welds shall meet the requirements of the original code of construction.

Item NB15-1902

Single Strike-through and single underline: Comments/edits by Walt Sperko and Nathan Carter including NBIC Items 15-0509 and Nb15-1403 from January 2015 NBIC meeting in Orlando, FL

Double Strike-through and double underline: Proposed edits by EPRI

2.5.3.6 Welding Method 6

This welding method provides ~~guidance~~ requirements for welding only Grade 91 tube material within the steam boiler setting and when ~~it's~~ it is impracticable to perform local post-weld heat treatment (PWHT). ~~This repair method utilizes a controlled fill technique.~~ When using this welding method, the following ~~is required~~ apply:

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

(2) Application shall be limited to only boiler tube repairs at a location internal to the boiler setting.

~~(3) Upon the completion of weld repair, the repair region shall be kept from humid or moist environments until the return to service~~. Upon completion of weld repair, the repair area shall be kept above the dew point temperature so that condensation does not form on the repair surface before returned to service or a moisture-barrier coating shall be applied to the surface.

(a) The material shall be limited to P-No 15E, Group 1, Grade 91, creep strength enhanced ferritic steel (CSEF).

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

(c) The ~~test material for the~~ welding procedure qualification test coupon shall be P-No 15 E, Group 1, Grade 91 ~~for the repair.~~

(d) Qualification thickness limits of base metal and weld deposit thickness ~~for the test plates and repair groove depths~~ shall be in accordance with ASME Section IX, QW-451.

(e) The Welding Procedure Specification (WPS) shall be qualified in accordance with the requirements of ASME Section IX., ~~except that no~~ No postweld heat treatment shall be applied to the test coupon. Additionally, the ~~qualification~~ WPS shall include the following requirements;

1) The minimum preheat for the GTAW process shall be 200 deg F (~~93~~100 deg C). The minimum preheat for the SMAW process shall be 300 deg F (150 deg C). The preheat temperature shall be checked to ensure the minimum preheat temperature is maintained during welding and until welding is completed. The maximum interpass temperature shall be ~~400 deg F (200 deg C).~~ 550 deg F (290 deg C).

(2) When the SMAW process is specified for a fill pass layer ~~as a controlled filled welding technique,~~ the electrode diameter is restricted to a maximum size of 1/8 in. (3.2 mm). When the GTAW-process is specified, any limits in filler size is to be ~~reflected in the qualified PQR and~~ shown on the WPS.

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

(4) The filler metal shall be limited to an austenitic, nickel-base filler metal having a designation F-No. 43 and limited to the following consumables: ERNiCr-3 (e.g., Filler Metal 82), ENiCrFe-3 (e.g., INCONEL Welding Electrode 182), ENiCrFe-2 (e.g., INCO WELD A), ASME B&PV Code Cases 2733

Comment [SJ1]: George, please fill in

Comment [GG2]: The words in blue were revised based on approval of item NB15-1402.

Comment [GG3]: The highlighted blue was revised under another action NB15-0509.

and 2734 (e.g., EPRI P87) or
(5) A martensitic, iron-base filler metal having a designation F-No. 4 or F-No. 6 and limited to the following consumables: E8015-B8, E8018-B8 or ER80S-B8.

NB15-1903

5.3 DISTRIBUTION OF FORM R-1

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

5.4 DISTRIBUTION OF FORM R-2

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

NBIC Subcommittee R&A Action Block

Subject Change reference standard, "ACCP-189" to "ANSI/ASNT CP-189" and also included reference to the ACCP Program.

File Number NB15-2802 **Prop. on Pg.**

Proposal Explanation In NBIC Part 3, Paragraph S6.10 b), "ACCP-189" is referenced, but this standard does not exist. The correct reference standard is "ANSI/ASNT CP-189". This does not appear to be an errata though. It first appeared this way in the 2007 Edition of NBIC Part 3, when Supplement 6 was first printed. Either SNT-TC-1A or CP-189 is used as a guideline for employers to establish their written practice and not used for meeting the examination and demonstration requirements. From the existing language, it appears that the intent was to also include the ACCP Program. This item also includes reference to the ACCP Program and other editorial modifications, which brings this paragraph in line with Paragraph 4.2 b).

Project Manager Nathan Carter

Task Group Negatives **TG Meeting Date**

NBIC Subcommittee R&A Action Block

NBIC Part 3, Paragraph S6.10 b)

Current

b) NDE personnel shall be qualified and certified in accordance with the requirements of the original code of construction. When this is not possible or practicable, NDE personnel may be qualified and certified in accordance with their employer's written practice. ASNT SNT-TC-1A, *Recommended Practice for Nondestructive Testing Personnel Qualification and Certification*, or ACCP-189, *Standard for Qualification and Certification of Nondestructive Testing Personnel*, may be used to fulfill the examination and demonstration requirements of SNT-TC-1A and the employer's written practice. Provisions for qualification and certification of NDE personnel shall be described in the "TR" Certificate Holder's written quality system.

Proposed

b) NDE personnel shall be qualified and certified in accordance with the requirements of the original code of construction. When this is not possible or practicable, NDE personnel may be qualified and certified in accordance with their employer's written practice. ASNT SNT-TC-1A, *Recommended Practice for Nondestructive Testing Personnel Qualification and Certification*, or ANSI/ASNT CP-189 ~~*ACCP-189*~~, *Standard for Qualification and Certification of Nondestructive Testing Personnel*, shall be used as a guideline for employers to establish their written practice. The ASNT Central Certification Program (ACCP) may be used to fulfill the examination and demonstration requirements of ~~SNT-TC-1A and~~ the employer's written practice. Provisions for training, experience, qualification and certification of NDE personnel shall be described in the "TR" Certificate Holder's written quality system.

Comment [NAC1]: Insert

Comment [NAC2]: Delete

Comment [NAC3]: Insert

Comment [NAC4]: Delete

Comment [NAC5]: Insert

IN15-0301 SC-Approved Proposed Response 7-15-15

There is no language in the NBIC that addresses storage or shelf life of pressure relief devices. Consult the manufacturer for recommendations on duration and proper conditions for pressure relief device storage. The NBIC Sub-Committee on Pressure Relief Devices recognizes a need to give some recommendations on this topic. An action item has been opened to address this topic.

Item NB-15-0302 Proposal 7-15-15

Part 3

5.12.3 CHANGES TO ORIGINAL PRESSURE RELIEF VALVE NAMEPLATE INFORMATION

a) If the set pressure is changed, the set pressure, capacity, and blowdown, if applicable, on the original nameplate or stamping shall be marked out, but left legible. The new capacity shall be based on that for which the valve was originally certified.

b) If service fluid is changed, the capacity, including units, on the original nameplate or stamping shall be marked out, but left legible. The new capacity shall be based on that for which the valve was originally certified, or if a conversion has been made, as described in NBIC Part 3, S7.2 on the capacity certification for the valve as converted.

c) If the Type/Model number is changed, the Type/Model number on the original nameplate shall be marked out, but left legible.

d) If the blowdown is changed, the blowdown, if shown on the original nameplate or stamping, shall be marked out,
but left legible. The new blowdown may be based on the current ASME Code requirements.

e) Incorrect information on the original manufacturer's nameplate shall be marked out, but left legible. Corrected information shall be indicated on the repair nameplate and noted on the document as required by the quality system.

4.4.2 PRESSURE INDICATING DEVICES

The need for pressure indicating devices should be considered in the design of the pressure vessel, and when required, the scale on the dial of the pressure gage shall be at least 25% above the highest set pressure of the pressure relief device.

4.5 PRESSURE RELIEF DEVICES

All pressure vessels shall be protected by pressure relief devices in accordance with the following requirements.

4.5.1 DEVICE REQUIREMENTS

~~a) Pressure relief devices are to be manufactured in accordance with a national or international standard and be certified for capacity (or resistance to flow for rupture disk devices) by the National Board.~~

a) Pressure relief devices shall be manufactured in accordance with a national or international standard and be certified for capacity or flow resistance by the National Board.

9.

d) Pressure relief devices shall be selected (e.g., material, pressure, etc.) and installed such that their proper functioning will not be hindered by the nature of the vessel's contents.

4.5.2 NUMBER OF DEVICES

At least one device shall be provided for protection of a pressure vessel. Pressure vessels with multiple chambers with different maximum allowable working pressures shall have a pressure relief device to protect each chamber under the most severe coincident conditions.

4.5.3 LOCATION

a) The pressure relief device shall be installed directly on the pressure vessel, unless the source of pressure is external to the vessel and is under such positive control that the pressure cannot exceed the maximum overpressure permitted by the original code of construction and the pressure relief device cannot be isolated from the vessel, except as permitted by NBIC Part 1, 4.5.6 e) 2).

b) Pressure relief devices intended for use in compressible fluid service shall be connected to the vessel in the vapor space above any contained liquid or in the piping system connected to the vapor space.

c) Pressure relief devices intended for use in liquid service shall be connected below the normal liquid line.

4.5.4 CAPACITY

a) The pressure relief device(s) shall have sufficient capacity to ensure that the pressure vessel is not exposed to pressure greater than that specified in the original code of construction.

b) If an additional hazard can be created by exposure of a pressure vessel to fire or other unexpected source of external heat, supplemental pressure relief devices shall be installed to provide any additional capacity that should be required.

c) Vessels connected together by a system of piping not containing valves that can isolate any pressure vessel should be considered as one unit when determining capacity requirements.

d) Heat exchangers and similar vessels shall be protected with a pressure relief device of sufficient capacity to avoid overpressure in case of internal failure.

5.2.6 HANGERS AND SUPPORTS

Support of piping shall consider loads (including wind and seismic loads) imposed on equipment or existing piping to which it is attached. Non-piping attachments such as ladders and walkways, equipment supports, temporary supports, structural supports, etc., shall not be connected to the piping unless such loads have been considered in the design of the piping and its supports. Design of hangers and supports for piping shall consider loads imposed by hydrostatic pressure testing. The installer shall remove pins from non-rigid hangers and seal plugs from hydraulic snubbers and temporary supports used for installation prior to placing the piping in service.

5.2.7 PROTECTION AND CLEANING

The installer shall exercise care during installation to prevent loose weld material, welding rods, small tools, and miscellaneous scrap metal from getting into the piping. The installer shall inspect and, where necessary, clean the interior of the piping and its appurtenances where possible, prior to making the final closures for the presence of foreign debris.

5.2.8 WELDING AND BRAZING

The installer should consider the impact of performing any preheating, welding, brazing, or postweld heat treatment on valves, instrumentation, or other heat sensitive equipment and, where appropriate, review the equipment manufacturer's recommended installation procedures prior to performing the work.

5.2.9 BOLTING

a) Pressure relief devices shall be manufactured in accordance with a national or international standard and be certified for capacity or flow resistance by the National Board.

5.3 PRESSURE RELIEF DEVICES

When required by the original code of construction, piping shall be protected by pressure relief devices in accordance with the following requirements.

5.3.1 DEVICE REQUIREMENTS

~~a) Pressure relief devices are to be manufactured in accordance with a national or international standard and be certified for capacity (or resistance to flow for rupture disc devices) by the National Board.~~

1) In certain cases piping standards permit the use of regulators, which may include integral pressure relief valves to limit the pressure in a piping system. In this case, capacity certification of the pressure relief valve is not required.

b) Dead weight or weighted lever pressure relief devices shall not be used.

c) Pressure relief devices shall be selected (i.e., material, pressure, etc.) and installed such that their proper functioning will not be hindered by the nature of the piping system's contents.

5.3.2 NUMBER OF DEVICES

At least one pressure relief device shall be provided for protection of a piping system. A pressure relief device installed on a pressure vessel or other component connected to the piping system should be used to meet this requirement. Portions of piping systems with different maximum allowable working pressures shall have a pressure relief device to protect each portion separately.

ITEM NB15-0306 Proposal 7-15-15

PART 1

2.9.2 FORCED-FLOW STEAM GENERATOR

For a forced-flow steam generator with no fixed steamline and waterline, equipped with automatic controls and protective interlocks responsive to steam pressure, safety valves may be provided in accordance with the above paragraphs identified in NBIC Part 1, 2.9.1 or the following protection against overpressure shall be provided:

a) One or more power-actuated pressure-relieving valves shall be provided in direct communication with the boiler when the boiler is under pressure and shall receive a control impulse to open when the maximum allowable working pressure at the superheater outlet is exceeded. The total combined relieving capacity of the power-actuated pressure-relieving valves shall be not less than 10% of the maximum design steaming capacity of the boiler under any operating condition as determined by the manufacturer. The valves shall be located in the pressure part system where they will relieve the overpressure. An isolating stop valve of the outside-screw-and-yoke type should be installed between the power-actuating pressure-relieving valve and the boiler to permit repairs provided an alternate power-actuated pressure-relieving valve of the same capacity is so installed as to be in direct communication with the boiler;

b) ~~Spring-loaded safety~~Pressure relief valves shall be provided having a total combined relieving capacity, including that of the power-actuated pressure-relieving valve, of not less than 100% of the maximum designed steaming capacity of the boiler, as determined by the manufacturer. In this total, credit in excess of 30% of the total relieving capacity shall not be allowed for the power-actuated pressure-relieving valves actually installed. Any or all of the ~~spring-loaded safety~~pressure relief valves may be set above the maximum allowable working pressure of the parts to which they are connected, but the set pressures shall be such that when all these valves (together with the power-actuated pressure-relieving valves) are in operation the pressure will not rise more than 20% above the maximum allowable working pressure of any part of the boiler, except for the steam piping between the boiler and the prime mover;

c) When stop valves are installed in the water-steam flow path between any two sections of a forced-flow steam generator with no fixed steamline and waterline:

1) The power-actuated pressure-relieving valve shall also receive a control impulse to open when the maximum allowable working pressure of the component, having the lowest pressure level upstream to the stop valve, is exceeded;

2) The ~~spring loaded safety~~pressure relief valve shall be located to provide overpressure protection for the component having the lowest working pressure; and

3) A reliable pressure-recording device shall always be in service and records kept to provide evidence of conformity to the above requirements.

4.4.2 PRESSURE INDICATING DEVICES

The need for pressure indicating devices should be considered in the design of the pressure vessel, and when required, the scale on the dial of the pressure gage shall be at least 25% above the highest set pressure of the pressure relief device.

4.5 PRESSURE RELIEF DEVICES

All pressure vessels shall be protected by pressure relief devices in accordance with the following requirements.

4.5.1 DEVICE REQUIREMENTS

a) Pressure relief devices are to be manufactured in accordance with a national or international standard and be certified for capacity (or resistance to flow for rupture disk devices) by the National Board.

b) Dead weight or weighted lever pressure relief valves shall not be used.

c) An unfired steam boiler shall be equipped with pressure relief valves as required in NBIC Part 1, 2.9.

d) Pressure relief devices shall be selected (e.g., material, pressure, etc.) and installed such that their proper functioning will not be hindered by the nature of the vessel's contents.

4.5.2 NUMBER OF DEVICES

At least one device shall be provided for protection of a pressure vessel. Pressure vessels with multiple chambers with different maximum allowable working pressures shall have a pressure relief device to protect each chamber under the most severe coincident conditions.

4.5.3 LOCATION

b) Pressure vessels that can be exposed to fire or other sources of unexpected external heat may require supplemental pressure relief devices to provide additional relieving capacity.

1) The combined capacity of all installed pressure relief devices shall be adequate to prevent the pressure from rising more than 21% above maximum allowable working pressure.

2) The set point of any supplemental pressure relief device(s) shall not exceed 110% of the maximum allowable working pressure. If a single pressure relief device is utilized to protect the vessel during both operational and fire or other unexpected external heating conditions, the set point shall not exceed maximum allowable working pressure.

a) The pressure relief device(s) shall have sufficient capacity to ensure that the pressure vessel is not exposed to pressure greater than that specified in the original code of construction.

~~b) If an additional hazard can be created by exposure of a pressure vessel to fire or other unexpected source of external heat, supplemental pressure relief devices shall be installed to provide any additional capacity that should be required.~~

c) Vessels connected together by a system of piping not containing valves that can isolate any pressure vessel should be considered as one unit when determining capacity requirements.

d) Heat exchangers and similar vessels shall be protected with a pressure relief device of sufficient capacity to avoid overpressure in case of internal failure.

ITEM NB15-0313 Proposal 7-15-15

PART 1

3.9.4.7 SAFETY RELIEF VALVE DISCHARGE PIPING

~~b~~a) The discharge from safety relief valves shall be so arranged that there will be no danger of scalding attendants. When the safety relief valve discharge is piped away from the water heater to the point of discharge, there shall be provisions for properly draining the piping and valve body. The size and arrangement of discharge piping shall be such that any pressure that may exist or develop will not reduce the relieving capacity of the relieving devices below that required to protect the water heater.

b~~a~~) When a discharge pipe is used, it ~~s internal cross sectional area~~ shall be not less than the ~~full area~~ nominal size of the valve outlet ~~or of the total of the valve outlets discharging thereinto~~, and shall be as short and straight as possible and so arranged as to avoid undue stress on the valve ~~or valves~~. When an elbow is placed on a safety relief discharge pipe, it shall be located close to the valve outlet.

c) Where multiple valves relieve into a common discharge pipe, the cross-sectional flow area of the common discharge pipe shall be equal to or greater than the sum of the individual valve discharge pipe areas.

5.2.6 HANGERS AND SUPPORTS

Support of piping shall consider loads (including wind and seismic loads) imposed on equipment or existing piping to which it is attached. Non-piping attachments such as ladders and walkways, equipment supports, temporary supports, structural supports, etc., shall not be connected to the piping unless such loads have been considered in the design of the piping and its supports. Design of hangers and supports for piping shall consider loads imposed by hydrostatic pressure testing. The installer shall remove pins from non-rigid hangers and seal plugs from hydraulic snubbers and temporary supports used for installation prior to placing the piping in service.

5.2.7 PROTECTION AND CLEANING

The installer shall exercise care during installation to prevent loose weld material, welding rods, small tools, and miscellaneous scrap metal from getting into the piping. The installer shall inspect and, where necessary, clean the interior of the piping and its appurtenances where possible, prior to making the final closures for the presence of foreign debris.

5.2.8 WELDING AND BRAZING

The installer should consider the impact of performing any preheating, welding, brazing, or postweld heat treatment on valves, instrumentation, or other heat sensitive equipment and, where appropriate, review the equipment manufacturer's recommended installation procedures prior to performing the work.

5.2.9 BOLTING

All mechanical joints and connections shall conform to manufacturers' installation instructions and recognized standards acceptable to the Jurisdiction having authority.

5.3 PRESSURE RELIEF DEVICES

When required by the original code of construction, piping shall be protected by pressure relief devices in accordance with the following requirements.

5.3.1 DEVICE REQUIREMENTS

codes of construction

a) Pressure relief devices are to be manufactured in accordance with a national or international standard and be certified for capacity (or resistance to flow for rupture disc devices) by the National Board.

   1) In certain cases piping ~~standards~~ permit the use of regulators, which may include integral pressure relief valves to limit the pressure in a piping system. In this case, capacity certification of the pressure relief valve is not required.

b)

c)

2) Some piping codes of construction permit the use of pressure relief devices without capacity certification. In this case, capacity certification of the pressure relief device by the National Board is not required.

5.3.2 NUMBER OF DEVICES

At least one pressure relief device shall be provided for protection of a piping system. A pressure relief device installed on a pressure vessel or other component connected to the piping system should be used to meet this requirement. Portions of piping systems with different maximum allowable working pressures shall have a pressure relief device to protect each portion separately.

NB15-0320 – Background information

BS&B Input (Steve Palmer):

"Manufacturers of rupture disks routinely advise to discard rupture disks IF the clamping force on the disk has been relieved or relaxed. Although the disk MIGHT be satisfactorily re-installed and re-used, there is certain possibility (probability) that the disk will NOT take the same "set" and may be expected to activate prematurely (nuisance activation) resulting in lost production. Accordingly, if it is desired to inspect a disk of a type installed in a NON-pretorqued rupture disk holder, the disk should be discarded and replaced. Disks which are installed into a pre-torqued holder where a holder mechanism (capscrews, etc) applies a clamping force to the disk, the RUPTURE DISK DEVICE (disk and holder together) may be removed from the relief piping without the torque being relaxed. Since the disk is immobile and prevented from moving in the holder when removed from the piping scheme, it may be inspected and cleaned (solvent and wash bottle only) and returned to service for extended use.

Ensure the holder is, in fact, "PRE-TORQUED" as opposed to "PRE-ASSEMBLED" (with side lugs which do NOT apply clamping energy to the disk)."

Oseco Input (Alan Wilson):

A rupture disc that can be removed from a system without releasing the disc from intimate contact with the holder, for example, a pre-torqued holder assembly, may be reinstalled after visual inspection. Other examples would be welded, soldered or threaded assemblies in which the threads that hold the disc in place are different threads than those that hold the disc assembly in place.

Fike Input (Dean Miller):

You are on the right track. I would probably use a little more generic language as there are a range of assembly methods and the user may not understand the nuances of holder design and what is pretorque vs non-pretorque. Also I'm not sure that pretorque is necessarily a condition of reuse.

> "If the rupture disc is removed from its holder it should not be reused. When the rupture disc assembly is removed and remains as an assembly without removal of the rupture disc it may generally be re-installed after inspection. Consult the Manufacturer's instructions for specific recommendations."

Marston Input (Trevor Hughes):

"Rupture disks that are installed using a specified bolting torque procedure cannot be reused after inspection and must be replaced" is a broad sweeping statement. From the Marston perspective, there is no real reason why a disc can't be re-used providing it is re-assembled carefully and in accordance with Manufacturer's Instructions. However, logically, it would be 'recommended practice' to change the disc whilst it is dismantled. This may be influenced by costs to the plant to replace a burst disc verses the cost to replace during normal down time.

Different manufacturers have different designs and sealing methods, one sealing method is a ‘bite seal’ where a raised part in the holder plastically deforms the disc to produce the seal. It would be difficult to ensure this lined up precisely again once reassembled. This may also be the case with other forms of sealing.

The above comments apply to all discs, not only those which are assembled using a specified Assembly or Flange Bolt Torque.

My suggestion for the statement would be along the lines of:

> ”Rupture disks should only be reused following inspection, in accordance with Manufacturers recommendations.”

Proposed Change to Part 2, 2.5.5.3 g) 9):

9) Since rupture disks are single activation devices, a visual inspection is the only inspection that can be performed. A rupture disk that is removed from its holder it should not be reinstalled. A rupture disk contained in an assembly that can be removed from a system without releasing the force maintaining the intimate contact between the disk and the holder, such as pre-torqued, welded, soldered, and some threaded assemblies, may be suitable for reinstallation after visual inspection. The manufacturer should be consulted for specific recommendations.

1) PRV part weld repairs shall be performed under the “R” Certificate Holder’s quality system; however, the requirements for in-process involvement of the Inspector (see NBIC Part 3, 1.3.2) may be waived. The requirement for stamping is waived.

2) The process of identifying and controlling repairs shall be documented in the “R” Certificate Holder’s quality system.

3) PRV part repairs shall be documented on a Form R-1 with a statement under Remarks “PRV Part Repair.” The owner’s name and location of installation shall be that of the “VR” Certificate Holder. The information received from the “VR” Certificate Holder as required in NBIC Part 3, S7.3 a) shall be noted under “Description of Work.”

4) Upon completion of the repair, the repaired part and completed Form R-1 shall be returned to the “VR” Certificate Holder responsible for completing the PRV repair.

S7.4 MATERIALS FOR PRESSURE RELIEF DEVICES

The materials used in making repairs shall conform to the requirements of the original code of construction. The “VR” Certificate Holder is responsible for verifying identification of existing materials from original data, drawings, or unit records and identification of the materials to be installed.

S7.5 REPLACEMENT PARTS FOR PRESSURE RELIEF DEVICES

a) Critical parts shall be fabricated by the valve manufacturer or to the manufacturer’s specifications. Critical parts are those that may affect the valve flow passage, capacity, function, or pressure-retaining integrity.

b) Critical parts not fabricated by the valve manufacturer shall be supplied with material test certification for the material used to fabricate the part.

c) Replacement critical parts receiving records shall be attached or be traceable to the valve repair document (see NBIC Part 3, ~~S7.3 a)~~. These records shall conform to at least one of the following:

1.7.5.4 i)

1) Receiving records documenting the shipping origin of the part fabricated by the valve manufacturer (such as packing list) from the valve manufacturer or assembler of the valve type;

2) A document prepared by the “VR” Certificate Holder certifying that the replacement part used in the repair has the manufacturer’s identification on the part or is otherwise labeled or tagged by the manufacturer and meets the manufacturer’s acceptance criteria (e.g., critical dimensions found in maintenance manual);

3) Receiving records for replacement critical parts obtained from a source other than the valve manufacturer or assembler of the valve type shall include a *Certificate of Compliance* that provides as a minimum:

   a. The part manufacturer and part designation;

   b. A certifying statement that either:

      1. The part was fabricated by the valve manufacturer and meets the manufacturer’s acceptance criteria (e.g., critical dimensions found in maintenance manual), or

      2. The part meets the manufacturer’s specifications and was fabricated from material as identified by the attached material test report.

   c. The signature of an authorized individual of the part source;

SUPPLEMENT 7
REQUIREMENTS FOR REPAIRS TO PRESSURE RELIEF DEVICES

S7.1 SCOPE

This supplement provides general requirements that apply to repairs to pressure relief valves. Repairs may be required because of defects found during periodic inspections because testing has identified that valve performance does not meet the original code of construction requirements, failure during operation, or for routine preventative maintenance.

S7.2 GENERAL REQUIREMENTS

a) Repair of a pressure relief valve is considered to include the disassembly, replacement, re-machining, or cleaning of any critical part, lapping of a seat and disc, reassembly, adjustment, testing, or any other operation that may affect the flow passage, capacity, function, or pressure-retaining integrity.

b) Conversions, changes, or adjustments affecting critical parts are also considered repairs. The scope of conversions may include changes in service fluid and changes such as bellows, soft seats, and other changes that may affect Type/Model number provided such changes are recorded on the document as required for a quality system and the repair nameplate. (See NBIC Part 3, 5.12.1).

c) The scope of repair activities shall not include changes in ASME Code status.

d) When a repair is being performed under the administrative requirements for National Board Accreditation, a repair shall consist of the following operations as a minimum:

   1) Complete disassembly, cleaning, and inspection of parts, repair or replacement of parts found to be defective, reassembly, testing as required by NBIC Part 3, 4.5, sealing and application of a repair nameplate. When completed, the valve's condition and performance shall be equivalent to the standards for new valves.

   2) The administrative requirements for National Board Accreditation apply only to valves that are stamped with an ASME "V," "UV," or "NV" Code symbol or marked with an ASME "HV" symbol and have been capacity certified on the applicable fluid by the National Board.

S7.3 WELD REPAIRS TO PRESSURE RELIEF VALVE PARTS

a) The Quality System Manual may include controls for the "VR" Certificate Holder to have the pressure relief valve part repaired by a National Board "R" Certificate Holder, per this supplement provided the following documentation is provided to the "R" Certificate Holder:

   1) Code of construction, year built;

   2) Part identification;

   3) Part material specified; and

   4) "VR" Certificate Holder's unique identifier for traceability as required by the Repair Inspection Program.

b) Prior to performing weld repairs to pressure relief valve (PRV) parts, the "R" Certificate Holder shall receive repair information required by NBIC Part 3, S7.3 a) from the "VR" Certificate Holder responsible for the pressure relief valve repair.

1) State the title of the individual responsible for the purchasing of all material.

2) State the title of the individual responsible for certification and other records as required.

3) All incoming materials and parts shall be checked for conformance with the purchase order and, where applicable, the material specifications or drawings. Indicate how material or part is identified and how identity is maintained by the quality system.

i) **Repair and Inspection Program**

The repair and inspection program section shall include reference to a document (such as a report, traveler, or checklist) that outlines the specific repair and inspection procedures used in the repair of pressure relief valves. Repair procedures shall require verification that the critical parts meet the valve manufacturer's specification. NBIC Part 3, S7.14 outlines recommended procedures covering some specific items. Provisions shall be made to retain this document for a period of at least five years.

1) Each valve or group of valves shall be accompanied by the document referred to above for processing through the plant. Each valve shall have a unique identifier (e.g., repair serial number, shop order number, etc.) appearing on the repair documentation and repair nameplate such that traceability is established.

2) The document referred to above shall describe the original nameplate information, including the ASME Code symbol stamping and the repair nameplate information, if applicable. In addition, it shall include material checks, replacement parts, conversion parts (or both), reference to items such as the welding procedure specifications (WPS), fit-up, NDE technique, heat treatment, and pressure test methods to be used. Application of the "VR" stamp to the repair nameplate shall be recorded in this document. Specific conversions performed with the new Type/Model Number shall be recorded on the document. There shall be a space for "signoffs" at each operation to verify that each step has been properly performed.

3) The system shall include a method of controlling the repair or replacement of critical valve parts. The method of identifying each spring shall be indicated.

4) The system shall also describe the controls used to ensure that any personnel engaged in the repair of pressure relief valves are trained and qualified in accordance with NBIC Part 3, Supplement 7.

j) **Welding, NDE, and Heat Treatment (when applicable)**

The quality system manual shall indicate the title of the person(s) responsible for and describe the system used in the selection, development, approval, and qualification of welding procedure specifications, and the qualification of welders and welding operators in accordance with the provisions of NBIC Part 3, S7.12 and S7.13.

1) The quality system manual may include controls for the "VR" Certificate Holder to have the pressure relief valve part repaired by a National Board "R" Certificate Holder, per NBIC Part 3, S7.3.

2) The completed Form R-1 shall be noted on and attached to the "VR" Certificate Holder's document required in NBIC Part 3, 1.7.5.4. i). Similarly, NDE and heat treatment techniques must be covered in the quality system manual. When outside services are used for NDE and heat treatment, the quality system manual shall describe the system whereby the use of such services meet the requirements of the applicable section of the ASME Code.

k) **Valve Testing, Setting, and Sealing**

The system shall include provisions that each valve shall be tested, set, and all external adjustments sealed according to the requirements of the applicable ASME Code Section and the National Board. The

1) PRV part weld repairs shall be performed under the “R” Certificate Holder’s quality system; however, the requirements for in-process involvement of the Inspector (see NBIC Part 3, 1.3.2) may be waived. The requirement for stamping is waived.

2) The process of identifying and controlling repairs shall be documented in the “R” Certificate Holder’s quality system.

3) PRV part repairs shall be documented on a Form R-1 with a statement under Remarks “PRV Part Repair.” The owner’s name and location of installation shall be that of the “VR” Certificate Holder. The information received from the “VR” Certificate Holder as required in NBIC Part 3, S7.3 a) shall be noted under “Description of Work.”

4) Upon completion of the repair, the repaired part and completed Form R-1 shall be returned to the “VR” Certificate Holder responsible for completing the PRV repair.

S7.4 MATERIALS FOR PRESSURE RELIEF DEVICES

The materials used in making repairs shall conform to the requirements of the original code of construction. The “VR” Certificate Holder is responsible for verifying identification of existing materials from original data, drawings, or unit records and identification of the materials to be installed.

S7.5 REPLACEMENT PARTS FOR PRESSURE RELIEF DEVICES

a) Critical parts shall be fabricated by the valve manufacturer or to the manufacturer’s specifications. Critical parts are those that may affect the valve flow passage, capacity, function, or pressure-retaining integrity.

b) Critical parts not fabricated by the valve manufacturer shall be supplied with material test certification for the material used to fabricate the part.

c) Replacement critical parts receiving records shall be attached or be traceable to the valve repair document (see NBIC Part 3, S7.3 a). These records shall conform to at least one of the following:

1) Receiving records documenting the shipping origin of the part fabricated by the valve manufacturer (such as packing list) from the valve manufacturer or assembler of the valve type;

2) A document prepared by the “VR” Certificate Holder certifying that the replacement part used in the repair has the manufacturer’s identification on the part or is otherwise labeled or tagged by the manufacturer and meets the manufacturer’s acceptance criteria (e.g., critical dimensions found in maintenance manual);

3) Receiving records for replacement critical parts obtained from a source other than the valve manufacturer or assembler of the valve type shall include a ~~*Certificate of Compliance*~~ document that provides as a minimum:

a. The part manufacturer and part designation;

b. A certifying statement that either:

1. The part was fabricated by the valve manufacturer and meets the manufacturer’s acceptance criteria (e.g., critical dimensions found in maintenance manual), or

2. The part meets the manufacturer’s specifications and was fabricated from material as identified by the attached material test report.

c. The signature of an authorized individual of the part source;

NBIC – ASME Liaison Report

- Separation of Conformity Assessment Requirements
  - Establish uniform conformity assessment requirements
  - CA-1 - 2014 edition issued to expand coverage
  - Adopted in 2015 Edition for BPV I and X; work continues at BPV IV, VIII and XII
  - Continuing discussions on “date” vs “evergreen” reference
- BPV Parts Fabrication Certificate Program
  - New Certificate scope with “PRT” Designator, providing for fabrication w/o design responsibility
  - Certificates to apply across multiple Code Sections
  - Published in 2015 Edition for BPV I, IV and XII; work continues at BPV VIII
- ASME NDE Personnel Certification Program
  - 3rd party central certification for NDE personnel and QC technicians, with transportable credentials
  - ANDE-1 Standard approved
  - Alternative to current Book Section requirements

NBIC – ASME Liaison Report

- QAI initiatives to improve feedback on AIA performance
  - Team Leader reports during survey reviews
  - Desk Top reviews
- New ASME Section I, Part PL, “Locomotive Boilers”
- Task Group on evaluation of AIA inspection requirements
- Development of a Field Site Certification program
  - Modeled after Temporary Code Shop Authorization
  - Identification provided in CA Connect
- Proposed new ASME Section XIII, “Rules for Overpressure Protection”
- Certificate Numbers on Data Plates (parking lot)
- Proposed certification program for ASME B31.1 Covered Piping

NBIC - AWS Liaison Report

The following listed actions are currently in process within the American Welding Society.

- D1.1 2015 is coming out in late August
- D1.5-2015 will be coming out by the end of 2015.
- Additional SWPS-N are in process of development (two are presently in the balloting processing and an additional 17 are in process of development.
- SWPSs 1/8-010 and 1/8-231 has been revised and is presently in Typesetting (this document will be submitted to the NBIC for adoption in the near future.
- B2.1-Addmenment presently is in the balloting stages through committee to adopt several editorial corrections discovered after final approval of the standard.
- A new PWHT document is under consideration by the D10 Committee on Piping and Tubing
- Qualification and Certification of PWHT operators

Jim Sekely

Status of API-CRE Subcommittee on Inspection Work Program – July 2015
(Based on minutes available on API SCI web site)

Document	Title of Current Edition	Rev. Due	Chair/Group Expert	Status	Start Work	Possession
API 510	Pressure Vessel Inspection Code—9th Edition	2019	M. Geisenhoff/ J. Reynolds	10th Edition due in 2019		SCI
API 570	Piping Inspection Code—3rd Edition, 2009	2016 (2 year CRE ext.)	D. Wang	J. Reynolds under contract as master editor. 3rd re-ballot under review.	In Process	SCI
RP 571	Damage mechanisms – 2nd Edition	2016 (3rd Ed. Due)	SCCM	Will coordinate with SCCM to review inspection related sections.	In Process	SCCM
RP 572	Inspection of Pressure Vessels—3rd Edition, 2009	2016 (2 year CRE ext.)	R. Konet	Being balloted in 2015. Resolve ballots for 2016 completion.	In Process	SCI
RP 573	Inspection of Fired Boilers and Heaters—2nd Edition, 2002. Reaffirmed 2010.	2018	C. White	API RP 573, Inspection of Fired Boilers and Heaters, Third Edition was published Oct 2013		SCI
RP 574	Inspection Practices for Piping System Components—3rd Edition, 2009	2016 (CRE 2 year ext.)	D. Wang	RP 574 4th Edition reviewing final ballot negatives.	In Process	SCI
RP 575	Inspection of Atmospheric and Low Pressure Storage Tanks—3rd Edition, 2014	2019	R. Sitton	3rd Edition published April 2014		SCAST
RP 576	Inspection of Pressure Relieving Devices—3rd Edition, 2009	2016 (CRE 2 year ext.)	R Schubert / B Thomas	4th Edition balloting underway in 2015.	In Process	SCI
RP 577	Welding Inspection and Metallurgy—2nd Edition, December 2013	2018			In Process	API
RP 578	Material Verification Program for New and Existing Alloy Piping Systems—2nd Edition,	2015	SR3 to PCC to form TG to revise	2nd Edition published April 2010. Balloting draft of 3rd Edition in 2015.	Spring 2014	SCI

Status of API-CRE Subcommittee on Inspection Work Program – July 2015
(Based on minutes available on API SCI web site)

	2010					
RP 579	Fitness for Service—2nd Edition, 2007	2012	D. Osage	Handled by joint API –ASME Committee. Contracts for editing and publishing are in place. Continuous balloting of parts as developed or revised.		CRE
RP 580	Risk Based Inspection—2nd Edition, 2009	2015 (CRE 1 year ext.)	C. White	First ballot 3rd Edition resolving ballot responses.	In Process	SCI
RP 581	Risk Based Inspection Technology—2nd Edition, 2008	2015 (CRE 2 year ext.)	B. Ray	RP 581 TG formed as consensus group to approve RP. Requires API RBI software revision after latest edition approved. 4th ballot results being resolved.	Ongoing	SCI
RP 583	Corrosion Under Insulation—1st Edition, May 2014	2019	J Monroe / F. Furillo			API
RP 584	Integrity Operating Windows—1st Edition, May 2014	2019	C White / J. Reynolds			SCI
RP 585	Pressure Equipment Integrity Incident Investigation—1st Edition, April 2014	2019	R Konet/ V. Edley			SCI
RP 586 - check with editing for number	NDE Methods for Equipment Damage Mechanisms Document – NEW	New First edition	J. Krynicki	Under development.	New first edition	SCI
Pub. 587	Ultrasonic Examiner Qualification	New First edition	J. Krynicki	1st Edition balloted but did not pass. Intent is to document what is considered equivalent to " API CUTE/QUSE" testing program.	New first edition	SCI

Board. Such appeal is initiated by a written request, addressed to the National Board's Executive Director setting forth the grounds for such appeal. The appeal shall be heard at the next regular or special meeting of the Board which is held at a time of sufficient duration following such request as to allow distribution of all relevant documents and materials to the Board members. The Board, upon considering such appeal, by affirmative majority vote of those present, may allow a variance, may direct the NBIC Committee to consider a revision, or may sustain the action of the National Board Appeals Committee. The decision of the Board of Trustees on such appeal shall be final.

10.0 Records

Records shall be retained for a minimum of five (5) years or until approval of the subsequent revision or reaffirmation of the complete standard. Records for withdrawn standards shall be retained for a minimum of 5 years after withdrawal or until the next ANSI audit, whichever is longer.

11.0 Antitrust Policy

The National Board of Boiler and Pressure Vessel Inspectors shall comply with the ANSI Antitrust Policy as described in the most current version of the ANSI Essential Requirements.