Date Distributed: January 22, 2015

THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

NATIONAL BOARD INSPECTION CODE COMMITTEE

MINUTES

Meeting of January 22, 2015
Orlando, FL

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

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

1. **Call to Order**

The meeting was called to order at approximately 8:00am local time.

2. **Introduction of Members and Visitors**

NBIC Committee Chairman Don Cook asked all NBIC Committee members and visitors to introduce themselves. An attendance list is attached (Attachment Pages 1-8). Based upon member attendance, the two-thirds majority needed to pass new items was established.

3. **Announcements**

A service award was presented to George Galanes by National Board Executive Director David Douin.

Recognition was given and a gift was presented to former NBIC Secretary Robin Hough by NBIC Chair Don Cook.

A brief presentation was given on using breakout sessions during subgroup meetings by Subgroup on Installation Chair Melissa Wadkinson.

4. **Adoption of the Agenda**

The following items were changed in the agenda prior to the commencement of the meeting:

- Added reappointment vote for Mr. Tim Barker membership on Subcommittee on Inspection.
- Added vote for Angelo Bramucci membership on Subcommittee on Repairs and Alterations.
- Added action items NB15-0103, NB15-0104, and NB15-0105 to Section 7) a) Subcommittee on Installation section of the agenda.
- Added action items NB11-0204 and NB15-0204 to 7) b) Subcommittee on Inspection section of the agenda.
- Moved action item NB13-0902 in the agenda from 7) b) Subcommittee on Inspection section of the agenda to 7) c) Subcommittee on Repairs and Alterations section of the agenda.
- Added action items NB14-0702, NB15-1401, NB15-1403, and NB15-1404 to Section 7) c) Subcommittee on Repairs and Alterations section of the agenda.
- Added action items NB15-0316, NB15-0317, NB15-0318, NB15-0319, NB15-0320, and NB15-0321 to 7) d) Subcommittee on Pressure Relief Devices section of the agenda.

The agenda was adopted by a unanimous vote of the NBIC Committee.

5. **Approval of the Minutes of July 17, 2014 Meeting**

The minutes from the July 2014 meeting were approved by a unanimous vote of the NBIC Committee.

6. Review of Rosters

a. Resignations

Mr. Robert Reetz has retired from the State of North Dakota, therefore resigning from all NBIC committee activities.

b. Nominations

- A vote was taken for Mr. Sid Cammeresi for membership to the NBIC Committee. Mr. Cammeresi was approved for membership to the committee by a unanimous vote of the NBIC Committee, pending approval by the Chairman of the NB Board of Trustees. (No attachment)

- A vote was taken for Mr. Rob Troutt for membership to the NBIC Committee. Mr. Troutt was approved for membership to the committee by a unanimous vote of the NBIC Committee, pending approval by the Chairman of the NB Board of Trustees. (Attachment Pages 9-10)

- A vote was taken for Dr. Marshal Clark for membership to the Subcommittee on Inspection. Dr. Clark was approved for membership to the committee by a unanimous vote of the NBIC Committee, pending approval by the Chairman of the NB Board of Trustees. (Attachment Pages 11-13)

- A vote was taken for Mr. Joel Amato for membership to the Subcommittee on Repairs and Alterations. Mr. Amato was approved for membership to the committee by a unanimous vote of the NBIC Committee, pending approval by the Chairman of the NB Board of Trustees. (Attachment Page 14)

- A vote was taken for Ms. Kathy Moore for membership to the Subcommittee on Repairs and Alterations. Ms. Moore was approved for membership to the committee by a unanimous vote of the NBIC Committee, pending approval by the Chairman of the NB Board of Trustees. (Attachment Page 15)

- A vote was taken for Mr. Angelo Bramucci for membership to the Subcommittee on Repairs and Alterations. Mr. Bramucci was approved for membership to the committee by a unanimous vote of the NBIC Committee, pending approval by the Chairman of the NB Board of Trustees. (No attachment)

- A vote was taken for Mr. Ken Watson for membership to the Subcommittee on Installation. Mr. Watson was approved for membership to the committee by a unanimous vote of the NBIC Committee, pending approval by the Chairman of the NB Board of Trustees. (Attachment Page 16)

c. Reappointments

- A reappointment vote was taken for Messrs. Michael Webb and Lawrence McManoman for membership to the NBIC Committee. Mr. Webb and Mr. Mcmanoman were approved for reappointment to the committee by a unanimous vote of the NBIC Committee, pending approval by the Chairman of the NB Board of Trustees. (No attachment)

- A reappointment vote was taken for Messrs. Wayne Jones and Lawrence McManoman for membership to the Subcommittee on Repairs and Alterations. Mr. Jones and Mr. McManoman were approved for reappointment to the committee by a unanimous vote of the NBIC Committee, pending approval by the Chairman of the NB Board of Trustees. (No attachment)

- A reappointment vote was taken for Mr. Alton Cox for membership to the Subcommittee on Pressure Relief Devices. Mr. Cox was approved for reappointment to the committee by a unanimous vote of the NBIC Committee, pending approval by the Chairman of the NB Board of Trustees. (No attachment)

- A reappointment vote was taken for Mr. Tim Barker for membership to the Subcommittee on Inspection. Mr. Barker was approved for reappointment to the committee by a unanimous vote of the NBIC Committee, pending approval by the Chairman of the NB Board of Trustees. (No attachment)

7. Report of Subcommittees

a. Subcommittee on Installation

Subcommittee on Installation Chair Mr. Michael Richards presented on the following:

i. Interpretations

No interpretations were assigned to the Subcommittee on Installation

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:** Ms. Wadkinson gave a progress report on expanding the general requirements section in NBIC Part 1.		

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:** Unknown **Meeting Action:** Mr. Richards gave a progress report. Mr. Francis Brown is continuing work with the task group on this item.		

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. Moore gave a progress report. The task group is focusing on PVHOs for wound treatment, as well as the use of acrylic windows in PVHOs. Gary Scribner has been added to the task group and work has continued on this item.

Item Number: NB13-1101	NBIC Location: Part 1	Attachment Pages 17-18

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. Halley gave a progress report. An updated attachment was provided by Mr. Halley. Work is progressing on the development of a new supplement to address this item.

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. Moore gave a progress report. The subgroup is looking forward to new items being passed in Part 1 and whether new terms need to be added to those items based on the items. The subgroup is also looking back to items passed in the past few years to add new items to the index.

Item Number: NB14-1402	NBIC Location: Part 1, 3.5.3	No Attachment

General Description: Revise text for electrical requirements for heating boilers

Subgroup: Installation

Task Group: P. Bourgeois (PM), D. Patten, B. Moore, T. Creacy, K. Watson, P. Scheulke

Meeting Action: Mr. Bourgeois gave a report. SC Installation voted unanimously to close this item with no action because NFPA codes already address the subject of this item. The NBIC Committee voted unanimously to close this item with no action**.**

Item Number: NB15-0401	NBIC Location: Part 1, 2.5.1.3	Attachment Pages 19-24

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. Patten gave a report. SC Installation submitted a new proposal for a change to the text of the NBIC beyond the scope of the original action item. This item was passed in SC Installation with one negative vote by B. Moore. Mr. Moore presented the reasoning for his negative. Discussion was held by the committee. The item was withdrawn from voting in the NBIC Committee for further work.

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. Bourgeois gave a report. The committee wants to replace wording in the NBIC about ASME language to be consistent with ASME code. The Subcommittee on Installation voted unanimously to give National Board staff editorial license to address this issue. Discussion was held whether this item should be considered editorial. The NBIC Committee decided not to vote on giving National Board staff editorial license. National Board staff will search for and highlight the language that needs to be changed, and then the respective subcommittees will make the required changes.

Item Number: NB15-1301	NBIC Location: Part 1, Section 2	Attachment Page 25

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: Ms. Wadkinson gave a progress report. The task group reviewed wording in Section 2, Section 3, and CSD-1, and are working to develop new text in Section 2.

Item Number: NB15-1302	NBIC Location: Part 1, 2.8.1	Attachment Page 25

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: Ms. Wadkinson gave a progress report. The task group reviewed wording in Section 2, Section 3, and CSD-1, and are working to develop new text in Section 2.

iii. Action Items – New Business

Item Number: NB15-0103	NBIC Location: Part 1, 2.9.6 c)	Attachment Pages 26-27

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

Subgroup: N/A

Task Group: None assigned

Meeting Action: Mr. Richards gave a progress report. This item was transferred to the Subcommittee on Pressure Relief Devices for further work.

Item Number: NB15-0104	NBIC Location: Part 1, 2.5.1.3	Attachment Pages 28-29

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. Patten gave a progress report. This item was passed unanimously in SC Inspection. Discussion was held about reworking the paragraph where the table is found. This item was withdrawn from voting in the NBIC Committee for further work.

Item Number: NB15-0105	NBIC Location: Part 1	Attachment Pages 30-31

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 gave a progress report. The focus of the research has to do with discharge piping for heating and hot-water supply boilers. B31.9 allows non-metallic material for discharge piping, which the task group plans to address in more detail.

iv. Additional Activities

No additional activities were presented by Mr. Richards.

b. Subcommittee on Inspection

Subcommittee on Inspection Chair Mr. Mark Mooney presented on the following:

i. Interpretations

No interpretations were assigned to the Subcommittee on Installation

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. Withers reported that there had been no progress made.		

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. A proposal for a code change should be ready for the July, 2015 meeting.		

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. Newton gave a progress report. The Subcommittee on Installation has started to investigate biomass boiler requirements in Part 1.		

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:** T. Dillon (PM), J. Larson, R. Bryce **Meeting Action:** Mr. Mooney gave a progress report. A proposal for a code change should be ready for the July, 2015 meeting.		

Item Number: NB13-1002	NBIC Location: Part 2	Attachment Pages 32-34

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. A revised proposal for a code change was unanimously passed by the subcommittee. The NBIC Committee voted unanimously for this item to be sent out for vote via letter ballot.

Item Number: NB13-1201	NBIC Location: Part 2, 2.2.10.6	Attachment Page 35

General Description: Result of PR13-0209, distinguish more clearly between "good practices" and requirements

Subgroup: Inspection

Task Group: M. Mooney (PM), V. Newton, J. Safarz

Meeting Action: Mr. Mooney gave a report. The Subcommittee on Inspection voted unanimously to close this item with no action and provide a response to the commenter Mr. Francis Brown. The NBIC Committee voted unanimously to close this item with no action and provide a response to the commenter Mr. Francis Brown.

Item Number: NB13-1301	NBIC Location: Part 2	Attachment Pages 36-39

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. This item is being sent out for comment via letter ballot to the Subgroup on Inspection.

Item Number: NB13-1302	NBIC Location: Part 2	Attachment Pages 40-41

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. This item is being sent out for vote via letter ballot to the Subgroup on Inspection.

Item Number: NB13-1303	NBIC Location: Part 2	Attachment Pages 42-44

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. A proposal for a code change should be ready for the July, 2015 meeting.

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

General Description: Review requirements for fillet welded staybolts

Subgroup: Locomotive

Task Group: Unknown

Meeting Action: No report was given because the locomotive subgroup has not met since the last meeting.

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: Locomotive

Task Group: Unknown

Meeting Action: No report was given because the locomotive subgroup has not met since the last meeting.

Item Number: NB13-1701	NBIC Location: Part 2, 2.3.6.6	Attachment Pages 45-48

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 gave a progress report. This item is being sent out for vote via letter ballot to the Subcommittee on Inspection.

Item Number: NB14-0501	NBIC Location: Part 2	No Attachment

General Description: Identify terms from Part 2 that need to be added to the index

Subgroup: Inspection

Task Group: D. Canonico, M. Mooney

Meeting Action: Mr. Mooney gave a progress report. The index has been completed for the 2015 edition of the NBIC. This item was voted to be closed by a unanimous vote of the SC on Inspection. This item was closed by 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 report. This item was voted to be closed with no action by a unanimous vote of the SC on Inspection, with the intention of opening a new item to address inspection of specific types of high pressure vessels. The NBIC Committee chose to keep the item open to address the inspection concerns rather than close the old item and open a new item.

Item Number: NB14-1001	NBIC Location: Part 2, 5.2.1	Attachment Page 49

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 Subcommittee on Inspection sent this item back to the subgroup for more work.

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 reported that no progress has been made on this item.

Item Number: NB14-1906	NBIC Location: Part 2	Attachment Page 50

General Description: Remove the “scope” section for the supplements, Section 6.1, to maintain consistency with other parts of the NBIC

Subgroup: Inspection

Task Group: D. Canonico, M. Mooney, D. Graf

Meeting Action: Mr. Mooney gave a progress report. The Subcommittee on Inspection voted unanimously to remove Section 6.1 from NBIC Part 2 because Part 2 is the only part to contain Section 6.1. The NBIC Committee voted unanimously to remove Section 6.1 from the book.

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. The task group is checking consistency in references to local corrosion.

Item Number: NB15-0204	NBIC Location: Part 2, 5.5.2	Attachment Pages 51-53

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

Meeting Action: Mr. Mooney gave a progress report. This item has been moved to the subgroup and assigned a task group.

Item Number: NB15-0501	NBIC Location: Part 2, 7.10 h)	Attachment Page 54

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 progress report. Mr. Nathan Carter provided a report to the committee on his intent when he submitted the comment. A task group was assigned at the subgroup level to address this item.

Item Number: NB15-0502	NBIC Location: Part 2, 7.10 k)	Attachment Page 55

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 gave a progress report. A task group was assigned at the subgroup level to address this item.

Item Number: NB15-0503	**NBIC Location: Part 2, CO2 Supplement**	**Attachment Page 56**

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. A task group was assigned at the subgroup level to address this item.

Item Number: NB15-0504	**NBIC Location: Part 2, CO2 Supplement**	**Attachment Pages 57-59**

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

Meeting Action: Mr. Mooney gave a progress report. A task group was assigned at the subgroup level to address this item.

Item Number: NB15-0701	**NBIC Location: Part 2, 2.3.6.8**	**Attachment Pages 60-62**

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. A task group was assigned at the subgroup level to address this item.

Item Number: NB15-0801	**NBIC Location: Part 2, CO2 Supplement**	**Attachment Page 63**

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. A task group was assigned at the subgroup level to address this item.

Item Number: NB15-0901	NBIC Location: Part 2, CO2 Supplement	Attachment Pages 64-71
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. A task group was assigned at the subgroup level to address this item.		

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:** None assigned **Meeting Action:** Mr. Mooney gave a progress report. The subcommittee unanimously voted to give National Board staff editorial license to correct this issue. The NBIC Committee decided that this issue is not editorial, and that the committee would have to approve any changes suggested by National Board staff. National Board staff will begin work on this item, and a task group will be assigned in the July, 2015 meeting.		

iii. Action Items – New Business

No new business was presented by Mr. Mooney.

iv. Additional Activities

No additional activities were presented by Mr. Mooney.

c. Subcommittee on Repairs and Alterations

Subcommittee on Repairs and Alterations Chair Mr. George Galanes presented on the following:

i. Interpretations

Item Number: IN14-0401	NBIC Location: Part 3, 1.2	Attachment Pages 72-73

General Description: Interpretation questions regarding requirements for production impact tests after repair or alteration of a vessel

Subgroup: Repairs and Altterations

Task Group: Unknown

Meeting Action: Mr. Galanes gave a report. The Subcommittee on Repairs and Alterations voted unanimously close this interpretation with no response. The Subcommittee on Repairs and Alterations opened a new action item NB15-1405 to address production impact tests. Mr. Wielgoszinski explained the subject of the interpretation and the new action item. The NBIC Committee voted unanimously to close this interpretation with no response.

Item Number: IN14-0701	NBIC Location: Part 3	Attachment Page 74

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 presented the proposed answers to the interpretation questions along with the Subcommittee on Repairs and Alterations' rationale for their answers. SC Repairs and Alterations approved the interpretation response with one abstention. The NBIC Committee voted unanimously to send this item to letter ballot for vote.

Item Number: IN14-0801	NBIC Location: Part 3, 3.3.3) s)	Attachment Pages 75-76

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 gave a report. SC Repairs and Alterations motioned and approved the interpretation unanimously. The NBIC Committee voted unanimously to send this item to letter ballot for vote.

Item Number: IN15-0101	NBIC Location: Part 3, 3.3.2 e)	Attachment Page 77

General Description: Is seal welding of inspection opening covers, such as handhole plates or plugs, considered a routine repair?

Subgroup: Repairs and Alterations

Task Group: Unknown

Meeting Action: Mr. Galanes presented the Subcommittee on Repairs and Alterations' proposed response to the interpretation question. SC Repairs and Alterations previously approved the interpretation unanimously. The NBIC Committee voted unanimously to approve the Subcommittee on Repairs and Alterations' response to the 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.

Item Number: NB12-0801	NBIC Location: Part 3	Attachment Pages 78-87

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. Cauthon gave a progress report. Progress is being made in ASME BPV Section VIII Division 1 on a PHE appendix, which the task group is keeping tabs 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 gave a progress report. There was no action to report.

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

General Description: Review alternate methods of tube sheet repair

Subgroup: Locomotive

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

Meeting Action: Mr. Galanes gave a progress report. There was 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: Unknown

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

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: Unknown

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

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: Unknown

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

Item Number: NB13-1406	NBIC Location: Part 3, S1	No Attachment

General Description: Add requirements for repair and alteration of superheater units in locomotive boilers

Subgroup: Locomotive

Task Group: Unknown

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

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: Unknown

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

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: Unknown

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

Item Number: NB14-0203	NBIC Location: Part 3	Attachment Pages 88-89

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

Subgroup: Repairs and Alterations

Task Group: Unknown

Meeting Action: Mr. Galanes gave a progress report. SC Repairs and Alterations will vote to on this item via letter ballot.

Item Number: NB14-0301	NBIC Location: Part 3	Attachment Pages 90-92

General Description: Add requirements for encapsulation

Subgroup: Repairs and Alterations

Task Group: Unknown

Meeting Action: Mr. Galanes gave a progress report. SC Repairs and Alterations will comment on this item via letter ballot.

Item Number: NB14-0302	NBIC Location: Part 3, S6	Attachment Pages 93-101

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 gave a progress report. A new task group was formed to address "TR" program revisions.

Item Number: NB14-0701	NBIC Location: Part 3, 3.2.2 c)	Attachment Pages 102-103

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: Unknown

Meeting Action: Mr. Galanes gave a progress report. Mr. Wielgoszinski provided further information on the item. SC Repairs and Alterations will vote on this item via letter ballot.

Item Number: NB14-2401	NBIC Location: Part 3, S6.5	Attachment Pages 104-105

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. A new task group was formed to address "TR" program revisions.

Item Number: NB14-2402	NBIC Location: Part 3, S6.3	Attachment Pages 106-107

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. A new task group was formed to address "TR" program revisions.

Item Number: NB15-0507	NBIC Location: Part 3, 1.2 f)	Attachment Pages 108-109

General Description: Result of PR15-0104, clarify the definition of DOT when used in Part 3

Subgroup: Repairs and Alterations

Task Group: None assigned

Meeting Action: Mr. Galanes gave a progress report. A change of text to address this item was presented. SC Repairs and Alterations previously approved the text as a code change. The NBIC Committee unanimously voted to approve the proposed text as a code change.

Item Number: NB15-0508	NBIC Location: Part 3	Attachment Pages 110-116

General Description: Result of PR15-0125, PR15-0126, PR15-0127 and PR15-0130

Subgroup: Repairs and Alterations

Task Group: None assigned

Meeting Action: The NBIC Committee voted unanimously to close the original action item, NB15-0508, and open four new action items (NB15-1406, NB15-1407, NB15-1408, and NB15-1409) to address the individual public review comments. See below for committee action on the four new items.

Item Number: NB15-1406	NBIC Location: Part 3, 1.8.7.2	Attachment Pages 110-111

General Description: Result of PR15-0125, review personnel qualification programs cited in Part 3

Subgroup: Repairs and Alterations

Task Group: None assigned

Meeting Action: Mr. Galanes gave a report. Mr. Nathan Carter explained the rationale behind the comment. The Subcommittee on Repairs and Alterations voted unanimously to close this action with no action taken. The NBIC Committee voted unanimously to close this action with no action taken.

Item Number: NB15-1407	NBIC Location: Part 3, 1.8.8.2 j)	Attachment Page 112

General Description: Result of PR15-0126, add allowance for brazing and fusing in "NR" quality program requirements

Subgroup: Repairs and Alterations

Task Group: None assigned

Meeting Action: Mr. Galanes gave a report. Mr. Nathan Carter explained the rationale behind the comment and explained a proposed change to add new wording to the NBIC. The Subcommittee on Repairs and Alterations voted unanimously to approve the new wording. The NBIC Committee voted unanimously to approve the new wording.

Item Number: NB15-1408	NBIC Location: Part 3, 1.8.7.2 n) 2) f)	Attachment Pages 113-114

General Description: Result of PR15-0127, consider citing ASME Section V, Article 2, Mandatory Appendix VI for requirements for storing radiographs

Subgroup: Repairs and Alterations

Task Group: None assigned

Meeting Action: Mr. Galanes gave a report. Mr. Nathan Carter explained the rationale behind the comment and explained a proposed change to modify wording in the NBIC. The Subcommittee on Repairs and Alterations voted unanimously to modify the existing wording. The NBIC Committee voted unanimously to modify the existing wording.

Item Number: NB15-1409	NBIC Location: Part 3, 1.8.7.2 g)	Attachment Pages 115-116

General Description: Result of PR15-0130, a change is needed to address the situation where the owner subcontracts the work

Subgroup: Repairs and Alterations

Task Group: None assigned

Meeting Action: Mr. Galanes gave a report. Mr. Nathan Carter explained the rationale behind the comment and explained a proposed change to modify wording in the NBIC. The Subcommittee on Repairs and Alterations voted unanimously to modify the wording. The NBIC Committee voted unanimously to modify the wording.

Item Number: NB15-0509	NBIC Location: Part 3, 2.5.3.6	Attachment Pages 117-119

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: None assigned

Meeting Action: Two of the public review comments, PR15-0157 and PR15-0158, were removed from NB15-0509 and added to a new action item, NB15-1402. For NB15-0509, Mr. Galanes gave progress report on the use of proprietary electrode names in welding method 6. The Subcommittee on Repairs and Alterations approved a proposed wording change, but elected to return the item without vote for further work in light of new information.

See below for committee action on NB15-1402.

Item Number: NB15-1402	NBIC Location: Part 3, 2.5.3.6	Attachment Pages 120-121

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 gave a progress report. A task group was formed to work on the public comments related to humidity protection in Welding Method 6.

Item Number: NB15-0510	NBIC Location: Part 3, 3.3.4.9 b)	Attachment Page 122

General Description: Result of PR15-0119, should tube plugging by brazing be considered for inclusion?

Subgroup: Repairs and Alterations

Task Group: None assigned.

Meeting Action: The Subcommittee on Repairs and Alterations unanimously voted to close this item with no action. The NBIC Committee unanimously voted to close this item with no action.

Item Number: NB15-0511	NBIC Location: Part 3, 5.13.5.1	Attachment Page 123

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 gave a progress report. This item was transferred to the "NR" task group for further work.

Item Number: NB15-0512	NBIC Location: Part 3, S3.5.5 b)	Attachment Page 124

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

Subgroup: Graphite

Task Group: None assigned

Meeting Action: Mr. Galanes gave a progress report. This item was transferred for further work to the SG Graphite.

Item Number: NB15-0513	NBIC Location: Part 3, S6.14.1	Attachment Pages 126-127

General Description: Originally contained PR15-0122 and PR15-0136; now only addressing PR15-0122, regarding inconsistent use of the term "Registered Inspector" in supplement 6

Subgroup: Repairs and Alterations

Task Group: None assigned

Meeting Action: Public review comment PR15-0136 was removed from this action item, and a new action item NB15-1410 was created to address that comment. For NB15-0513, corresponding to PR15-0122, Mr. Galanes gave a progress report. Alternative wording to NBIC Part 3, S6.14.1 f) was proposed in the Subcommittee on Repairs and Alterations, and this new wording was approved by a unanimous vote of the subcommittee. The alternative wording was approved by a unanimous vote of the NBIC Committee.

See below for committee action of NB15-1410, corresponding to PR15-0136

Item Number: NB15-1410	NBIC Location: Part 3, S6.14	Attachment Page 125

General Description: Result of PR15-0136, 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 gave a progress report. This item was transferred for further work to the "TR" task group.

Item Number: NB15-1003	NBIC Location: Part 3	No Attachment

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

Subgroup: Repairs and Alterations

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

Meeting Action: Mr. Galanes gave a progress report. A task group was assigned for further work with Rob Troutt as the project manager.

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: None assigned

Meeting Action: Mr. Galanes gave a report. In July 2015, a presentation will be given by HJ3 Composite Technologies, Inc. about this system.

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: None assigned

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

iii. Action Items – New Business

Item Number: NB14-0702	NBIC Location: Part 3, 3.3.2 e)	Attachment Pages 128-130

General Description: Limit what repairs should be considered routine

Subgroup: Repairs and Alterations

Task Group: Unknown

Meeting Action: Mr. Galanes gave a progress report. Mr. Wielgoszinski gave further detail about the history of the item. Alternative wording was unanimously approved via letter ballot by the Subcommittee on Repairs and Alterations last year, but was missed on the July 2014 agenda. The alternative wording was unanimously approved by the NBIC Committee.

Item Number: NB15-1401	NBIC Location: Part 3, Section 3	Attachment Pages 131-132

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 gave a progress report, and a new task group was formed to address this issue.

Item Number: NB15-1403	NBIC Location: Part 3	Attachment Pages 133-177
General Description: Creat 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. Siefert presented a powerpoint presentation with research on Grade 91 steel that could be used to develop a new supplement		

Item Number: NB15-1404	NBIC Location: Part 3, 1.6.1, 3.2.1	Attachment Pages 178-179
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 gave a progress report. The task group is working to develop a footnote in the text to define existing material.		

iv. Additional Activities

No additional activities were presented by Mr. Galanes.

d. Subcommittee on Pressure Relief Devices

Subcommittee on Pressure Relief Devices Chair Mr. Sid Cammeresi presented on the following:

i. Interpretations

No interpretations were assigned to the Subcommittee on Installation

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. The task group is reading through all three books to find necessary changes. Part 4 is expected to be ready by January 2016.		

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 gave a report. Work is progressing to solicit manufacturer participation in the task group.		

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 gave a progress report. More research into valve disassembly will be pursued before more action can be taken on this item.

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 gave a progress report. This item has been put on hold until 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 gave a progress report. This item has been put on hold until Part 4 is completed.

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

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

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

Meeting Action: Mr. Cammeresi gave a progress report. This item has been put on hold until 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 gave a progress report. The task group has been tasked with providing a proposal for this item at the July, 2015 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 gave a progress report. The task group has been tasked with providing a proposal for this item at the July, 2015 meeting.

Item Number: NB15-0302	NBIC Location: Part 3, 5.12.3 d)	No Attachment

General Description: Review blowdown requirements

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

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

Item Number: NB15-0303	NBIC Location: Part 1, 4.5.1 and 5.3.1	No Attachment

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

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

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

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. Work is progressing in the task group. Discussion was held about what information needs to be verified under the "VR" program. The proposal will be revised and letter balloted the subcommittee before the next meeting.

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 gave a progress report. A task group was formed to work on this item.

Item Number: NB15-0306	NBIC Location: Part 1, 2.9.2	No Attachment

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

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

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

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 gave a progress report. Discussion was held about the scope of the Subcommittee on Pressure Relief Devices' work, and whether it includes "UD" and "TV" stamped valves.

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

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

Item Number: NB15-0309	NBIC Location: Part 1, 4.5.6, 5.3	Attachment Pages 180-182

General Description: Change "should" to "may" in referenced paragraphs

Task Group: None assigned

Meeting Action: Mr. Cammeresi gave a progress report. A proposed change to the text of the NBIC was approved by a unanimous vote of the subcommittee. The NBIC Committee voted unanimously to place this item for vote via letter ballot.

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 gave a progress report. Work is continuing on the development of a proposal to be voted on at a future meeting.

Item Number: NB15-0311	NBIC Location: Part 1, 4.5.4 b)	No Attachment

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

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

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

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 gave a progress report. The task group assigned to this item was enlarged to allow for further work.

Item Number: NB15-0313	NBIC Location: Part 1, 3.9.4.7	No Attachment

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

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

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

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 gave a progress report. A task group was formed to work on this item.

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 gave a progress report. A task group was formed to work on this item.

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

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

Task Group: None assigned

Meeting Action: Mr. Cammeresi gave a progress report. This item will be worked on in conjuction with the development of the new Part 4.

iii. Action Items – New Business

Item Number: NB15-0316	NBIC Location: Part 3, 1.7.5.4 q)	Attachment Pages 183-186

General Description: Test equipment qualification requirements – lift assist

Task Group: None assigned

Meeting Action: Mr. Cammeresi gave a report. A text change proposal was presented for this item. The NBIC Committee voted unanimously to place this item for vote via letter ballot.

Item Number: NB15-0317	NBIC Location: Part 1, 5.3.1 a)	No Attachment

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 gave a progress report. A task group was formed to work on this item.

Item Number: NB15-0318	NBIC Location: Part 1, 1.7.5 b) and Part 2, 2.5.2 a)	Attachment Pages 187-189
General Description: Review set pressure requirements for multiple valve installations **Task Group:** None assigned **Meeting Action:** Mr. Cammeresi gave a progress report. A text change proposal was presented for this item. The NBIC Committee suggested a change to the proposal. The NBIC Committee voted unanimously to place this item for vote via letter ballot.		

Item Number: NB15-0319	NBIC Location: Part 2, 2.5.8 f)	Attachment Page 190
General Description: I nspection and testing frequency does not take into account external environment for installed pressure relief device **Task Group:** None assigned **Meeting Action:** Mr. Cammeresi gave a progress report. A text change proposal was presented for this item. This text change proposal was unanimously approved by Subcommittee on Pressure Relief Devices. This text change proposal was modified by the NBIC Committee, and the modified proposal was unanimously approved by the NBIC Committee.		

Item Number: NB15-0320	NBIC Location: Part 2, 2.5.5.3 g) 9)	No Attachment
General Description: Review torqued flanged disk requirements **Task Group:** B. Nutter (PM) **Meeting Action:** Mr. Cammeresi gave a progress report. A task group was formed to work on this item.		

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 gave a progress report. A task group was formed to work on this item.		

iv. Additional Activities

Mr. Cammeresi reported about a presentation given to the Subcommittee on Pressure Relief Devices about a test-only certificate for pressure relief devices. Discussion was held about the presentation, but no new items were opened. Further discussion will continue about this presentation in July.

8. Liaison Activities

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

Mr. Paul Edwards presented PowerPoint slides on ASME-National Board liaison activities. The presentation included the separation of conformity assessment requirements, BPV parts fabrication

certificate program, ASME NDE personnel certification program, QAI initiatives to improve feedback on AIA performance, new ASME Section I Part PL, proposed new ASME Section XIII "Rules for Overpressure Protection", certificate numbers on data plates, and potential certification program for ASME B31.1 covered piping. (Attachment Page 191)

b. American Welding Society (AWS)

No report was given on AWS liaison activities because AWS-National Board liaison Mr. Jim Sekely was absent.

c. American Petroleum Institute (API)

Mr. Jim Riley gave a brief report on notable events with API. Jim reported that changes to API 576 regarding pressure relief devices were sent out via letter ballot for comment and those comments are being addressed. He also stated that no significant changes have been made to API 510 or API 576.

d. International Code Council (ICC)

Mr. Scribner presented in place of Mr. Withers. Mr. Withers' appointment to the ICC expired, and will not be renewed. This item will be removed from future agendas.

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

Mr. Scribner reported that he may take part in ASME PCC committees in the future.

9. New Business

No additional new business was presented.

10. Future Meetings

Mr. Cook gave a report on plans for future meetings. The following meetings have been scheduled:

July 13th-16th, 2015 – Columbus, Ohio
January 10th – 14th, 2016 – Arizona

Mr. Cook presented options for the location of the 2017 January NBIC Meeting. The three options presented were San Diego, Austin, and New Orleans. A hand vote was taken to determine the NBIC Committee's preference. San Diego received seven votes, Austin received ten votes, and New Orleans received two votes. Mr. Cook reminded the committee that this vote is only a recommendation to the National Board Executive Director, and the final decision will be made by the Executive Director.

11. Adjournment

The meeting was adjourned by a unanimous vote of the NBIC Committee at approximately 2:00pm local time.

Respectfully submitted,

Brad Besserman
NBIC Secretary

Attendance List NBIC Committee

Meeting Date: January 21, 2015

Robert V. Wielgoszinski Hartford Steam Boiler I & I of CT. One State Street Hartford, CT 06103 C: 860-670-0779 Ph: 860-722-5064 Fax: 860-722-5705 E-mail: Robert_wielgoszinski@hsbct.com	Attended: Yes ☑ No ☐ RVW *Initial*	**Mark Mooney** Liberty Mutual Insurance<br~~Chief Engineer~~ Technical Director 20 Riverside Road MS:03BN Weston, MA Ph: 781-891-890 x 37107 Fax: 781-642-6512 E-mail: Mark.Mooney@Libertulmual.com	Attended: Yes ☑ No ☐ MM *Initial*
Don Cook Principal Safety Engineer Pressure Vessel Unit State of California 1515 Clay Street, Suite 1622-A Oakland CA 94612 Ph: 510-622-3050 Fax: 510-622-3063 E-mail: dcook@dir.ca.gov	Attended: Yes ☑ No ☐ DC *Initial*	**Benjamin Anthony** Chief B&PV Inspector Department of Labor & Training Division of Occupational Safety 1511 Pontiac Ave., Bldg. 70-2 PO Box 20157 Cranston, RI 02920-0942 Ph: 401-162-8574 Fax: 401-462-8576 Email: banthony@dlt.state.ri.us	Attended: Yes ☐ No ☐ *Initial*
Larry McManoman Great Lakes Apprenticeship Program 566 W. 95th Street Oak Lawn, IL 60453 Ph: 708.636.6656 Fax: E-mail: Lmac@gLabap.com	Attended: Yes ☐ No ☐ *Initial*	**H. Michael Richards** Southern Company 42 Inverness Center Pkwy. Birmingham, AL 35242 Ph: 205-992-7111 Fax: 205-992-0361 E-mail: hmrichar@southernco.com	Attended: Yes ☒ No ☐ HMR *Initial*
Jim Riley Phillips 66 1380 San Pablo Ave. Rodeo, CA 94572-1354 P: 510-245-5895 F: E-mail: jim.riley@P66.com	Attended: Yes ☑ No ☐ JR *Initial*	**James Sekely** Welding Services, Inc. 716 Vanderbilt Drive Monroeville, PA 15146 Ph: 412-389-5567 Fax: 724-327-7381 E-mail: jsekely@comcast.net	Attended: Yes ☐ No ☐ *Initial*
Ralph Pate State of Alabama/Department of Labor 649 Monroe Street Montgomery, AL 36131 Ph: 334-242-3066 Fax: 334-353-4528 Email: Ralph.Pate@labor.alabama.gov	Attended: Yes ☒ No ☐ RPP *Initial*	**Mike Webb** Xcel Energy 9500 Interstate 76 Henderson, CO 80640 Ph:303-628-2840 Fax: 303-628-2928 E-mail: mike.webb@xcelenergy.com	Attended: Yes ☑ No ☐ MW *Initial*

Attendance List NBIC Committee

Meeting Date: January 21, 2015

Stanley Staniszewski, Jr. US Dept. of Transportation, Hazardous Materials Safety Pipelines & Administration 1200 New Jersey Ave. S.E. Washington, DC 20590 Ph: 202-366-4545 x 0453 Fax: 202-366-3753 E-mail: stanley.staniszewski@dot.gov	Attended: Yes ☐ No ☐ *Initial*	**Domenic A. Canonico** Canonico & Assoc. 1423 East Brown Road Signal Mountain, TN 37377 Cell: 423-322-1797 Ph: 423-886-1008 Fax: E-mail: canonicod@ebpfi.com	Attended: Yes ☐ No ☐ *Initial*
James T. Pillow Common Arc Corporation 67 Wyndemere Lane Windsor, CT 06095 Cell: 860-539-9160 Ph: 860-688-2531 Fax:860-688-2531 E-mail: JPillow@Commonarc.com	Attended: Yes ☑ No ☐ *Initial*	**Paul D. Edwards** Const. Mgr. ASME Programs Construction Department, Power Sector CB&I 150 Royall Street Canton, MA 02021 Ph: 617-589-5476 Fax: 617-589-1792 5677 E-mail: paul.edwards@CBI.com	Attended: Yes ☑ No ☐ *Initial*
Robin Hough NBIC Coordinator The National Board of B&PVI 1055 Crupper Ave. Columbus, OH 43229 Ph; 614-888-8320 Fax: 614-847-1828 E-mail: rhough@nationalboard.org	Attended: Yes ☐ No ☐ *Initial*	**George W. Galanes, PE** Metallurgical Consulting Engineer Diamond Technical Services, Inc./Lisle, IL Office Ph: 630-799-8162 Cell: 312-925-1341 Cell Fax: Email:ggalanes@diamondtechnicalservices.com	Attended: Yes ☒ No ☐ *Initial*
Venus Newton Manager of Jurisdictional Inspection Services One CIS Insurance Company 3380 Chastain Meadows Pkwy Kennesaw, GA 30144 Ph: 770-590-6726 Cell: 678-457-1310 Fax: E-mail: venus.newton@us.bureauveritas.com	Attended: Yes ☑ No ☐ *Initial*	**Craig Hopkins** Seattle Boiler Works 500 South Myrtle Street Seattle, WA 98108 Ph: 206-762-0737 Fax: 206-762-3516 E-mail: chopkins@seattleboiler.com	Attended: Yes ☐ No ☐ *Initial*

Attendance List NBIC Committee

Meeting Date: January 21, 2015

Brian Morelock Eastman Chemical Company P.O. Box 511 B54D Kingsport, TN 37660 Ph: 423-229-1205 Fax: 423-229-6099 Email: morelock@eastman.com	Attended: Yes ☒ No ☐ *Initial*	**Paul Bourgeois** Travelers Insurance 12318 Hidden Falls Drive Northport, AL 35475 Ph:205-339-6314 Fax: 888-803-1522 E-mail: pcbourge@travelers.com	Attended: Yes ☑ No ☐ *Initial*
Bryan Schulte NRG Maintenance Services 12307 Kurland Drive Houston, TX 77034 Ph: 713-795-1456 Fax: 713-795-1451 E-mail: bryan.schulte@nrgenergy.com	Attended: Yes ☑ No ☐ *Initial*	**Ron Pulliam** Babcock & Wilcox Power Generation Group 20 South Van Buren Ave. BVSO2E Barberton, OH 44203 Ph; 330-860-2856 Fax: 330-860-2180 Email: RLPulliam@babcock.com	Attended: Yes ☒ No ☐ *Initial*
Kevin Simmons Pentair Valves and Controls 3950 Greenbriar Stafford, TX 77477 Ph: 281-274-4526 Fax: 281-797-6676 Email: kevin.simmons@pentair.com	Attended: Yes ☒ No ☐ Initial	Name: Sidney Cammeresi Furmanite Address: 1513 23rd Ave. N. Phone: (409) 392-0271 Fax: E-mail: scammeresi@furmanite.com	Attended: Yes ☒ No ☐ Initial
Name: Address: Phone: Fax: E-mail:		Name: Address: Phone: Fax: E-mail:	

Attendance List NBIC Committee

Meeting Date: January 21, 2015

Name: Melissa Wadkinson Address: Fulton Phone: 315 382 8481 Fax: E-mail: Melissa.wadkinson@fulton.com	Name: RANDY CAUTHON ALSTOM POWER Address: WINDSOR CT Phone: 860-285-3481 Fax: E-mail: randel.t.cauthon@alstom.com
Name: GEOFF HALLEY Address: ABMA Phone: 636 394 3483 Fax: E-mail: ghalleysji@aol.com	Name: Angelo Bramucci Address: Alstom Power Inc. 175 Addison Rd. Windsor, CT 06095 Phone: Fax: 860-285-9176 E-mail: angelo.c.bramucci@power.alstom.com
Name: DAN MAREK Address: 21000 BROOKPARK RD MAIL STOP 5-5 CLEVELAND, OH 44135 Phone: 216-433-5494 Fax: E-mail: DANIEL.T.MAREK@NASA.GOV	Name: JIM LARSON Address: 2540 180th ST E PRIOR LK, MN 55372 Phone: 612.868.1192 Fax: E-mail: JLARSON@ONECIS.COM JMLOGHOME@EARTHLINK.NET

Attendance List NBIC Committee

Meeting Date: January 21, 2015

Name: DAVE BUECHEL
Address: 4300 SETON ST
Pittsburgh, PA 15227
Phone: 412-310-7740
Fax: 412-885-8120
E-mail: DAVID_BUECHEL@HSB.COM

Name: TIM BARKER
FM GLOBAL
Address: 601 108TH AVE NE
BELLEVUE WA 98006
Phone: 360 801 3790
Fax:
E-mail: TIMOTHY.BARKER@FMGLOBAL.COM

Name: Chuck Withers
Address: NATIONAL BOARD
Phone:
Fax:
E-mail:

Name: Nathan Carter
Address: One State St.
Hartford, CT
Phone: 860-722-5750
Fax:
E-mail: nathan_carter@hsbct.com

Name: MIKE Schwartzwalder
Address: STRESS Engineering Services
AEP - 1 Riverside PLAZA
Columbus, Ohio 43215
Phone: 614-581-6456
Fax: 614-794-1469
E-mail: MSchwartzwalder@Stress.com

Name: Thomas White
NRG Energy
Address: 12307 Kurland Drive
Houston, TX 77034
Phone: 281-782-4972
Fax:
E-mail: thomas.white@nrg.com

Name: JIM GETTER
WORTHINGTON INDUSTRIES
Address: 200 OLD WILSON BRIDGE RD
COLUMBUS, OH 43085
Phone: 614-840-3087
Fax:
E-mail: JIM.GETTER@WORTHINGTONINDUSTRIES.COM

Name: Frank Johnson
PBF Energy
Address: 1819 Woodville Rd
Oregon, Ohio 43616
Phone: 419-697-6614
419-386-8450
Fax:
E-mail: FrankLJohnson@PBFEnergy.com

Attendance List NBIC Committee

Meeting Date: **January 21, 2015**

Name: JAMIE WALKER Address: HALES MECHANICAL 5555 S. HARLEM AVE. CHICAGO, IL 60638 Phone: 773.292.2707 Fax: 773.784.0010 E-mail: JWALKER@HALESMECHANICAL.COM	Name: JEANNE BOCK Address: NB STAFF Phone: Fax: E-mail:
Name: GARY SCRIBNER Address: NB BPVT Phone: Fax: E-mail:	Name: JODI METZMAIER Address: NB STAFF Phone: Fax: E-mail:
Name: David Martinez Address: 2100 Reston Parkway Reston, VA 20191 Phone: 703-262-6311 Fax: 703-860-3187 E-mail: davidimartinez@Smglobal.com	Name: KEN WATSON Address: State of Mississippi Phone: ON FILE Fax: E-mail:

Attendance List NBIC Committee

Meeting Date: January 21, 2015

Name: PAUL WELCH Address: ARISE Phone: Fax: ON FILE E-mail:	Name: DON PATTEN Address: R.F. MACDONALD Co. Phone: ON FILE Fax: E-mail:
Name: WAYNE JONES Address: ON FILE ARISE Phone: Fax: E-mail:	Name: Stan Konopacki Address: NRG Phone: on File Fax: E-mail:
Name: WARREN TAYLOR III Address: 5000 DOMINION BLVD GLEN ALLEN, VA 23060 Phone: Fax: E-mail: WARREN.TAYLOR@DOM.COM	Name: Benjamin Schaefer Address: 1 Riverside Plaza 18th Floor Columbus, Ohio 43215 Phone: 614-716-1643 Fax: 614-716-1744 E-mail: bschaefer@aep.com

Attendance List NBIC Committee

Meeting Date: January 21, 2015

Name: Bonnie Petersen Marquip Ward United Address: 1300 N. Airport Rd Phillips WI 54555 Phone: 715-339-2191 Fax: E-mail: Bonnie.petersen@marquipwardunited.com	Name: Address: Phone: Fax: E-mail:
Name: Address: Phone: Fax: E-mail:	Name: Address: Phone: Fax: E-mail:
Name: Address: Phone: Fax: E-mail:	Name: Address: Phone: Fax: E-mail:
Name: Address: Phone: Fax: E-mail:	Name: Address: Phone: Fax: E-mail:

Robby D. Troutt
417 Chisholm Valley Drive
Round Rock, TX 78681
Phone: (512) 789-3166
Email: robtroutt@gmail.com

Certifications

- ASME Designee Certificate #1143
- National Board Team Leader Certificate #292
- National Board Commission # 13078 with A, B, and N Endorsements.
- ASME/In Service Texas Commission # 1787

Education

- 2008 National Board Review Team Leader Training Course
- 2008 National Board N Endorsement Course
- 2008 National Board B Endorsement Course
- 2006 National Board A Endorsement Course
- 2006 HSBCT National Board Pre-Commission Course
- 2000 Oklahoma State University, Oklahoma City, OK
    - Boiler Construction Systems, Operations and Maintenance Course
- 1993 Moore Norman Vo-Tech, Norman, Oklahoma
    - Heating Ventilation & Air Conditioning

Employment

Texas Department of Licensing and Regulations (TDLR)
Chief Boiler Inspector **Jan., 2008 – Current**

Responsibilities: Position performs complex managerial work overseeing the daily operations and activities of the state Boiler Program and staff. Work involves complex consultative and technical work in the planning, development and implementation of the oiler Program to facilitate the registration of boilers, their timely inspection, proper installation, maintenance, and operational safety. Duties include overseeing the inspection/certification activities to ensure boiler are properly installed, maintained, and safe to operate, monitoring performance/activities of boiler inspectors; performing reviews/inspections/investigations to ensure compliance with standards established by the National Board Inspection Code (NBIC) and American Society of Mechanical Engineers (ASME); reviewing request for variances/extensions and making recommendation; analyzing plans and inspection reports, rendering interpretations/opinions on code; preparing and disseminating administrative and technical materials; working with Department staff to establish and accomplish agency objectives; and providing consultative and technical services to agency staff, industry representatives, the Board of Boiler Rules, and the general public on all aspects of the Boiler Program and related industry matters. Plans, assigns and supervises the work of others.

Texas Department of Licensing and Regulations (TDLR)
Inspection Specialist **June, 2008 – Jan., 2013**

Responsibilities: Position as an Inspection Specialist includes serving as the Team Leader on behalf of the American Society of Mechanical Engineers (ASME) and National Board of Boiler and Pressure Vessel Inspectors in the Joint Review process. In this role I audit the applicants Quality Control System insuring ASME and National Board Inspection Code (NBIC) compliance. During this process both mandatory and non-mandatory recommendations are made to the applicant. As a result of these duties I have extensive knowledge of the ASME and NBIC requirements for Quality Control Systems and the ability to ensure proper

implementation. Other duties included as an Inspection Specialist are Supervising (7) Deputy Boiler Inspectors and assisting in resolving any issues that may arise. Serving as point of contact for boiler Owner/Operators and providing technical guidance to aid in resolving issues ensuring compliance with the Texas Boiler Law and Rules. Conducting training for Deputy Boiler Inspectors and Authorized Inspection Agencies Inspectors, and conducting boiler accident investigations. In addition to these duties a colleague and I performed the duties of the Chief Boiler Inspector while the position was vacant.

Hartford Steam Boiler Inspection & Insurance Company of Connecticut (HSBCT) J
Authorized Inspector **January, 2006 – June, 2008**
Responsibilities: As a Authorized Inspector I primarily conducted ASME Code Inspection for Boilers and Pressure Vessels being constructed to ASME Section I, Section VIII Division 1, Section VIII Division 2, Section VIII Division 3 and B31.1, and repairs and alterations in accordance with the National Board Inspection Code for the 30 clients assigned. I also coducted audits of my assigned clients Quality Control System insurning Code compliance, and the clients compliance with their System. From August 2007 to December 2007 I traveled to China where I conducted ASME Code inspections, audited Quality Control Systems, and assisted in traning of the newly hired Chinese Authorized Inspectors. When required I also conducted juridictional boiler inspections, and internal and external inspections of boiler and pressure vessels owned and operated by the federal government. These inspection were conducted in Texas, Oklahoma, Kanas, Colorado, New Mexico, California.

CSP, LLC (formerly DynPar)
Boiler Plant Operations Supervisor, Tinker AFB **2000 – 2006**
Responsibilities: Supervising up to 54 operators including scheduling, writing performance appraisals (along with comendations and reprimands) and the day to day management of employees was a skill I developed and improved upon. During the course of employment I conducted ISO-9000 internal audits and ensured (22) boilers were ready for semi-annual inspections. Plant operational problems were assessed and solutions recommended. Responsibility for the 1.5 million dollar budget used for ordering boiler chemicals was left in my hands. Other duties include ordering parts used for performing repairs to boilers, chillers, and air compressors to ensure their safe operation. Daily and monthly logs were compiled and reports created as needed. Some of these reports included plant efficiency, boiler efficiency, makeup water usage, and chemical usage trends, along with tracking all expenses.

Oklahoma University Health Sciences Center
HVAC Technician **1998 - 2000**
Responsibilities: Job duties included operation, inspection, and repairs of Boilers, Absorption Units, and Chillers.

Oklahoma Department of Corrections (Mabell Bassett Correction Facility)
Maintenance Trades Supervisor **1996 - 1998**
Responsibilities: Duties included supervising and teaching female inmates proper techniques in repair, and maintaining HVAC equipment, plumbing, and elctrical componets.

A & L Heat and Air
HVAC Technician **1991 - 1996**
Responsibilities: Duties include repairing and installing HVAC equipment.

U.S. Army
Special Electrical Devices Repairman/Power Generation Repairman 1988 – 1991
Responsibilities: Duties include diognostic troubleshooting and repairing of electronic components such as Land Mine Dectors, Positioning Asthmath Determining Systems (1st Generation GPS), Searchlights (standard and Infrared), Nightvision Goggles (moonlight aplified, infrared and thermal) and 5KW to 60KW generators.

10813 South River Front Pkwy
Suite 135
South Jordan, UT 84095

Structural Integrity Associates, Inc.

Phone: (801) 676-0216
Fax: (801) 676-0227
structint.com

MARSHAL D. CLARK, Ph.D., P.E.
Associate

Dr. Clark has over 29 years of technical experience in welding, metallurgy, materials selection and testing, corrosion, failure analysis, and selection of protective coatings for the oil field, process, and electric power generation industries. He is able to develop and lead major inspection and condition assessment programs of electric power generation and process industries equipment and components including boilers, turbines, steam lines, fuel storage tanks, oil and gas production and refinery equipment. Dr. Clark has extensive experience in the design of weldments and selection of welding processes. Dr. Clark is able to perform in-depth failure analysis of metallic components using light optical and scanning electron microscopy, mechanical and chemical testing, and fractography and fracture mechanics. Dr. Clark has provided services as an expert witness on metallurgical failures associated with power generation, oil and gas production, and the aviation industry.

Dr. Clark is an Adjunct Associate Professor of Metallurgical Engineering for the University of Utah where he teaches a graduate course in Metallurgical Failure Analysis. He is also a collaborator on a DOE sponsored research program, through the University of Utah, on Novel Nanocrystalline Intermetallic Coatings for Metal Alloys in Coal-Fired Environments.

EDUCATION/PROFESSIONAL ASSOCIATIONS/REGISTRATIONS

Ph.D. - Metallurgical & Materials Engineering	Colorado School of Mines, 2001
B.S. - Metallurgical Engineering	Colorado School of Mines, 1979

Other Technical Education:

University of Alaska, “Cold Regions Engineering,” 1989
American Society of Mechanical Engineers, “ASME Boiler and Pressure Vessel Code: Section III,” 1988
University of Kansas, “Fracture and Fatigue Control in Structures,” 1988
American Society of Mechanical Engineers, “Remaining Life Evaluation,” 1987
National Association of Corrosion Engineers, “Basic Corrosion Course,” 1983
University of Tennessee, “Welding, Metallurgy, Quality, Inspection, Codes and Processes,” 1983
American Society for Metals, “Fractography,” 1979

Registrations:
Registered Professional Engineer in Colorado (23217), Utah (6659883-2202) and Wyoming (11320)

Member: American Society of Mechanical Engineers (ASME)
ASM International (American Society for Metals)
NACE International (National Association of Corrosion Engineers)
American Welding Society (AWS)

PROFESSIONAL EXPERIENCE

2006 to Present	Associate, Structural Integrity Associates, Inc.
2003 to 2006	Principal Engineer, PacifiCorp Energy
2002 to 2003	Senior Consultant, Engineering Systems, Inc.
1994 to 2001	President, Investigative Engineering Corporation
1981 to 1994	Materials Engineering Group Coordinator, Stone & Webster Engineering Corporation
1979 to 1981	Manager of Metallurgical Engineering, Otis Engineering Corporation

PRESENTATIONS

Fan, P., Riddle, E., Fang, Z.Z., Sohn, H.Y. and Clark, M.D., "Iron Aluminide Coating Produced by Plasma Transferred Arc Process," presented at 8th International Conference on Trends in Welding Research, June 2008, Pine Mt., GA.

Clark, M. and Porter, A., "The Use of Linear Phased Array Ultrasonics for the Inspection of Boiler Tube Welds In Lieu of Radiography," EPRI Boiler Reliability Work Group Meeting, Dallas, TX, November 2006.

Clark, M., "The Use of Linear Phased Array Ultrasonics for the Inspection of Boiler Tube Welds In Lieu of Radiography," presented at Electric Power Materials Committee Meeting, June 2006, Sawgrass, FL.

Clark, M.D. and Edwards, G.R., “Microstructural Characterization of Low Alloy Steel Weldments Containing Yttrium,” presented at the 82nd Annual AWS Convention, Cleveland, OH 6-10, 2001.

Clark, M.D. and Edwards, G.R., “Microstructural and Fractographic Characterization of SMAW Filler Metal for HSLA 100 Steel,” presented at the 79th Annual AWS Convention, Detroit, MI, 26-29 April 1998.

PUBLICATIONS

Co-author of "Fossil Plant High Energy Piping Damage: Theory and Practice," Electric Power Research Institute, Volume 1(Product ID 1012201): June 2007, Volume 2 (Product ID 1015505): November 2007, Volume 3 (Product ID 1016212): March 2008

Clark, M., Huntsman, L., Healy, Q., Arnold, J., "PacifiCorp Energy's Experience with Circumferential Weld Repairs in High Energy Piping Systems," presented at EPRI International Conference on Advances in Condition and Remaining Life Assessment for Fossil Power Plants, October 2006, Louisville, KY.

Clark, M., Metzler, C., Arnold, J., Elkins, C., "The Use of Linear Phased Array Ultrasonics for the Inspection of Boiler Tube Welds In Lieu of Radiography," presented at EPRI International Conference on Advances in Condition and Remaining Life Assessment for Fossil Power Plants, October 2006, Louisville, KY.

Clark, M., Huntsman, L., Healy, Q., Arnold, J., "PacifiCorp Energy's Experience with Circumferential Weld Repairs in High Energy Piping Systems," presented at EPRI Welding and Repair Technology for Power Plants, June 2006, Sawgrass, FL.

Clark, M., Healy, Q., and Bisbee, L., "Evaluation of Creep Damage in Girth Welds in a Hot Reheat Piping System," presented at Materials and Corrosion Experience for Fossil Power Plants, Isle of the Palms, SC, November 18-21, 2003, EPRI.

Clark, M.D. and Edwards, G.R., "Inclusion Growth in Yttrium Containing Low Alloy Steel Welds through Liquid Phase Sintering," presented at Trends in Welding Research 6th International Conference, Pine Mountain, GA, April 15-19, 2002, AWS/ASM.

Clark, M.D. and Edwards, G.R., "Characterization of Weld Metal Oxides in Low Alloy Steel Welds Containing Yttrium," presented at the Materials solutions Conference and Exposition, St. Louis, MO, October 9-12, 2000.

Clark, M.D., "Inspecting Welds with Time-of-Flight Diffraction," The Fabricator, June 1999, Vol. 29, No. 6, pp. 38-41.

Bisbee, L., Clark, M., Nottingham, L., and Queen, H., "Ultrasonic Detection and Characterization of Incipient Creep Damage in High Energy Piping Seam Welds," EPRI Fossil Plant Inspection Workshop, San Antonio, Texas, 25 June 1999.

Clark, M.D. and Olson, D.L., "The Role of Welding Parameters in Hydrogen Management," presented at CANMET's Hydrogen Workshop, Ottawa, Ontario, 5-9 October 1998.

Clark, M.D., Edwards, G.R., and Landau, A., "Metallographic Techniques for Microstructural Characterization of SMAW Filler Metal for HSLA 100 Steel," presented at Trends in Welding Research 1998, Pine Mountain, GA, 1-5 June 1998.

Clark, M.D., Sehkar, N., Shattuck, D., and Wedig, C., "Corrosion Problems Associated with Pollution Control," National Association of Corrosion Engineers' South Central Region Conference, 1992.

Clark, M.D. and Galpin, D.S., "Critical Piping Inspection," Association of Rural Electric Generating Cooperatives Annual Meeting, 15-17 June 1987.

Clark, M.D., Hall, F.S., Keys, R.L., and Stasis, R.P., "Critical Piping Inspection Program at Utah Power & Light Company," EPRI Fossil Plant Inspection Workshop, 9-11 September 1986.

Clark, M., Potter, D. and Spence, N., "Critical Piping Assessment," Rocky Mountain Electric League, Spring Conference, May 1986.

Cavallo, J.R. and Clark, M.D., "New Advances in Corrosion Mitigation in the Geysers KGRA," National Association of Corrosion Engineers/Corrosion 84, April 1984.

443 Lafayette Road N.
St. Paul, Minnesota 55155
www.dli.mn.gov

MINNESOTA DEPARTMENT OF
LABOR & INDUSTRY

(651) 284-5005
1-800-DIAL-DLI
TTY: (651) 297-4198

April 29, 2013

George Galanes
Chairman
NBIC Committee for Repairs and Alterations
1055 Crupper Avenue
Columbus, Ohio 43229-1183

Dear Mr. Galanes:

This correspondence is in reference to serving on the National Board Inspection Code Committee for Repairs and Alterations.

If approved for membership on the committee, my management will allow me the time to attend all meetings, and I will devote the time necessary to support the functions of the National Board Inspection Code.

Sincerely,

Joel T. Amato
Chief Boiler Inspector
Construction Codes and Licensing Division
State of Minnesota

Joe Moore &
Company, Inc.
P. O. Box 6531
Raleigh, NC 27628
Phone (919) 832-1665
Fax (919) 832-8666
www.joemoorecompany.com

- Boiler Repairs
- 'R' 'U' & 'S' Stamps
- Pre-Krete Tank Linings
- Refractory Sales and Installation

December 30, 2014

The National Board of Boiler and Pressure Vessel Inspectors
1055 Crupper Avenue
Columbus, OH 43229
ATTN: Mr. George Galanes
Mr. Don Cook
Ms. Robin Hough

RE: Committee Membership

Dear Mr. Cook, Mr. Galanes and Ms. Hough;

I would like to become a volunteer member of National Board Inspection Code committee. As a vested manager of Joe Moore & Company, we are committed to providing all expenses for my travels regarding the committee meetings.

It would be an honor to serve on any of the code committees. Thank you for your consideration and I look forward to seeing you at the January meetings.

Respectfully;

Katherine B. Moore
Joe Moore & Company, Inc.

Kenneth L. Watson
805 S. Wheatley St.
Ridgeland, Mississippi 39157
601-991-6040
Kenneth.watson@msdh.state.ms.us

Professional Experience

40 years in the operation, maintenance, installation, repair, manufacturing and inspection of boilers and pressure vessels in accordance with A.S.M. E. Codes, the National Board Inspection Code, A.N.S.I. Standards, and other applicable codes, laws and regulations. Performed A.S.M.E./National Board Joint Reviews as the Team Leader from 1992 thru 2004. Held the position of A.I./A.I.S. from 1982 thru 1992 in an A.S.M.E. Section IV code shop. Held the positions of Deputy Boiler Inspector and Chief Boiler Inspector, from 1980 thru 2014 in Arkansas and Mississippi. I am currently serving as Chief Boiler inspector for the state of Mississippi since 2006. Hold National Board Commission #9360 with "A" and "B" endorsements. Serve on A.S.M.E. CSDAFB committee and the National Board Appeals Committee.

NB13-1101

Special Requirements for the Installation of Condensing Boilers (Rev. December 2014)

Rational

Define the aspects of installation of Condensing Boilers which are unique from other products covered by this section.

- *General Statements*

1. This section is written, based on the belief that Local, State or National Building Codes require the installation of a Carbon Monoxide (CO) detector/alarm in the boiler room.
2. The requirements of this paragraph are not intended to override those of the equipment manufacturer's Installation Manual, but rather to supplement them. In cases where a conflict exists, the manufacturer's requirements shall be followed.

- *Flue Gas Venting System Piping*

- The vent piping shall be corrosion resistant and fabricated from either stainless alloy or plastic, as defined by the boiler manufacturer, and Local, State or National Building Codes.
- The diameter of the vent piping shall be as defined by the boiler manufacturer and shall not be reduced over its entire length.
- The "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.
- 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. 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.

- *Sealed combustion systems*

- 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. Additionally the location of the combustion air intake shall be above the highest known snowline for the location involved.

- 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 burner manufacturer.
- *Combustion Quality – CSA High Turndown CO production 200 – 2000 ppm on 10:1 (For discussion – Should this be included in this section?)*

- *Condensate drain system*
- The flue gas condensate shall be collected at a single point, and the routing of the drain piping shall include the following features;
  - ✓ A water trap, the height of which (in inches) shall exceed the pressure drop of the flue gas vent piping by (? % or i.w.c.). Also refer to manufacturers instructions.
  - ✓ A visible means of ensuring that the condensate water trap contains the correct water level.
  - ✓ A discharge point away from occupied areas.
  - ✓ A method of controlling the pH of the condensate prior to its discharge into a sewer system, if required by local building Codes.

Future Actions

1) Once this document has been finalized, a second document outlining inspection requirements for condensing boiler installations will be prepared for use by Part 2 of the NBIC.

NB15-0401

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:

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:

CLEAVER BROOKS
The power of commitment.

September 19, 2014

Robin Hough, Secretary, NBIC Committee
The National Board of Boiler and Pressure Vessel Inspectors
1055 Crupper Avenue
Columbus, Ohio 43229

Re: Request for Revision
2013 NBIC, Part 1 Installation, Paragraph 2.5.1.3 a)

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.

Respectfully,

Peter A. Molvie
Manager, Codes & Standards

3232 West Lancaster Avenue • Milwaukee, Wisconsin 53209 • 414.359.0600
www.cleaver-brooks.com

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 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 drop across the boiler. The following table is a guideline for estimating feed pump differential:

Table 2.5.1.3
Guide for Feedpump Differential

Boiler Pressure		Boiler Feedwater Pump Discharge Pressure	
psig	(MPa)	psig	(MPa)
200	(1.4)	250	(1.7)
400	(2.8)	475	(3.3)
800	(5.5)	925	(6.4)
1,200	(8.3)	1,350	(9.3)

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.

Yes, I talked with Pete. His proposal is to remove "plus the expected pressure drop across the boiler". However there is also another issue, The first line says "Boiler feedwater pumps shall have a discharge pressure in excess of the boiler rated pressure (MAWP)" Then a second requirement is "Each source of feedwater shall be capable of supplying feedwater to the boiler at a minimum pressure of 3% higher than the highest safety valve on the boiler plus the expected pressure drop"

So an example,

200 psi MAWP steam boiler. By the first requirement the boiler would need to have pumps discharging above 200 psi.

The boiler has two safety valves both set at 150 psi. 150 plus 3% = 154.5 so 155 psi. to meet the second requirement.

So which is correct?

Assign this an action item, add it to the agendas, etc.

Thanks,

Gary L. Scribner

From: Peter Molvie <PMolvie@cleaverbrooks.com>
To: "rhough@nationalboard.org" <rhough@nationalboard.org>
Cc: "dcook@dir.ca.gov" <dcook@dir.ca.gov>, Bob Wielgoszinski <robert_wielgoszinski@hsbct.com>, "hmrichar@southernco.com" <hmrichar@southernco.com>
Date: 09/19/2014 04:41 PM
Subject: NBIC Revision Request

Robin,

Attached please find a request for revision to NBIC, Part 1, 2.5.1.3. Thanks.

Peter A. Molvie, P.E.
Manager, Codes & Standards
Cleaver-Brooks Product Development
3232 W. Lancaster Ave.
Milwaukee, WI 53209
414-438-5465

Item NB15-0401

Explanation of my negative vote.

I agree with the inquirer that the proposed phrase should be stricken and oppose the proposed revision for the following reasons:

1. The existing language already goes beyond the requirements of ASME Section I PG-61.1 by including design consideration for pressure drops (frictional losses) in piping. Design piping losses are beyond the scope of an installation standard.

ASME Section I	NBIC
PG-61 FEEDWATER SUPPLY PG-61.1 Except as provided for in PG-61.2 and PG-61.4, boilers having more than 500 ft2 (47 m2) 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 such means of feeding shall not be susceptible to the same interruption as the other, and each shall provide sufficient water to prevent damage to the boiler	2.5.1.3 Pumps a) 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 drop across the boiler. The following table is a guideline for estimating feed pump differential: The Table 2.5.1.3 is the subject of a new item.

2. Further, there are three Section I interpretations that address FW pump flow.

Interpretation: I-98-25
Subject: Section I, PG-61.1, Feedwater Flow Rate
Date Issued: June 24, 1999
File Number: BC99-225C
Related Documents: I-81-25

Question: Does Section I have rules for establishing the amount of feedwater to be provided in order to prevent damage to the boiler?

Reply: No. Also, see Interpretation I-81-25.

Interpretation:	I-81-25
Subject:	Section I, PG-61.1, Minimum Feedwater Flow Rate
Date Issued:	September 9, 1981
File Number:	BC-81-354
Related Documents:	I-81-20 I-98-25

Question: What is the minimum flow rate required to satisfy the requirements of PG-61.1?

Reply: Section I does not define the minimum flow rate required to satisfy the requirements of PG-61.1. It is the responsibility of the designer to provide for sufficient feedwater flow to satisfy all requirements of Section I.

Interpretation:	I-81-20
Subject:	Section I, PG-61 Feedwater Supply
Date Issued:	August 7, 1981
File Number:	BC-81-169
Related Documents:	I-81-25

Question (1): The rules of PG-61.1 require that each source of feedwater be capable of supplying water to the boiler at a pressure 3% higher than the highest setting of any safety valve on the boiler. Does the phrase "at a pressure" apply to the pressure at the feedwater pump outlet or to the pressure in the boiler drum?

Reply (1): The feedwater pressure requirements in PG-61.1 apply to pressures in the boiler drum, not to the pressure at the feedwater pump outlet.

Question (2): Is the total capacity of the feedwater source based on the maximum process steam requirements, or on the maximum boiler evaporation?

Reply (2): Section I rules do not address the capacity requirements for the boiler feedwater source.

3. The above Interpretation states that the FW pressure requirements are at the drum and that the delivered capacity at 3% overpressure is not addressed. Therefore, any discussion of flow losses in the NBIC is encroaching into construction code requirements that are beyond the scope of the NBIC.
4. Finally, a better solution to the inquirer's comment is to open a new item to completely review Section 2.5.1.3 including the table.

Brian W. Moore
Brian W. Moore
01/20/2015

Include these as additions to Part 1 for the agenda. Request for code addition.

Gary L. Scribner

From: "Nelson, Mike D." <mnelson@cabq.gov>

To: "'gscribner@nationalboard.org'" <gscribner@nationalboard.org>,

Date: 12/19/2014 10:09 AM

Subject:NBIC PART 1

Good morning. Per our conversation yesterday, I thought I would e-mail you, and bring up 2 areas I have found that need clarification.

NB15-1301

In NBIC part 1, section 3 (3.8.1.4) it states that “each automatically fired steam boiler shall be protected from overpressure be two pressure-operated controls.” My question is why isn’t this requirement also in section 2 for power boilers? It is a requirement in CSD-1(CW-310), but not found in NBIC part 1.

NB15-1302

The second question is regarding NBIC part 1 section 3(3.8.1.5-c). Two low water cutoffs are required on steam boilers and (c) states “a secondary low water cutoff with manual reset shall be provided on each automatically fired steam or vaporsystem boiler.” In section 2 (2.8.1) it states that “each automatically fired steam boiler shall be equipped with at least two low-water cutoffs.” My question is why is a manual reset required on the second LWCO in section 3 but not in section 2 for power boilers? This is required in CSD-1(CW-140) but not found in NBIC part 1.

Thank you and have a great weekend.

Michael Nelson
Boiler inspector
City of Albuquerque, Planning Dapartment
Building Safety Division
600 2nd ST NW
Albuquerque ,NM 87102
(505)924-3328
(505)924-3970 Fax
mnelson@cabq.gov

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:

c) The opening or connection between the boiler and the safety or safety relief valve shall have at least the area of the valve inlet and the inlet pipe to the pressure relief valve shall be no longer than the face to face dimension of the corresponding tee fitting of the same diameter and pressure class. When a discharge pipe is used, the cross-sectional area shall not be less than the full area of the valve outlet or of the total of the areas of the valve outlets discharging there into and shall be as short and straight as possible and arranged to avoid undue stresses on the valve or valves.

b) Statement of Need

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

Although the existing text is similar to ASME Section I PG-71.2, the face-to-face linear dimension of the tee is not well defined.

PG-71.2 The pressure relief valve or valves shall be connected to the boiler independent of any other connection, and attached as close as possible to the boiler or the normal steam flow path, without any unnecessary intervening pipe or fitting. Such intervening pipe or fitting shall be not longer than the face-to-face dimension of the corresponding tee fitting of the same diameter and pressure under the applicable ASME Standard listed in PG-42 and shall also comply with PG-8 and PG-39. Every pressure relief valve shall be connected so as to stand in an upright position, with spindle vertical. On high-temperature water boilers of the watertube forced-circulation type, the valve shall be located at the boiler outlet.

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.

This also potentially impacts Part 1 Section 2.9.1.2 c) which has a nearly duplicate requirement. Both locations need to clarified.

d) TG Assigned

Project Manager:	Brian W. Moore, P.E.
Members:	Todd Creacy and Stan Konopacki

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:

The following table is a guideline for estimating feed pump differential:

Table 2.5.1.3
Guide for Feedpump Differential

Boiler Pressure		Boiler Feedwater Pump Discharge Pressure	
psig	(MPa)	psig	(MPa)
200	(1.4)	250	(1.7)
400	(2.8)	475	(3.3)
800	(5.5)	925	(6.4)
1,200	(8.3)	1,350	(9.3)

b) Statement of Need

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

Remove the last sentence of Part 1. Pumps 2.5.1.3 a) “The following table is a guideline for estimating feed pump differential:” and Table in whole.

The table does not take into account all of the design variables of the various installations and systems and can result in providing incorrect guidance. In addition an oversized pump will in most cases not perform properly in normal operating conditions which are typically lower operating pressures than the highest setting of the safety relief valve on a power boiler.

NB15-0104

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

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:

Not addressed

b) Statement of Need

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

The issue is what type of materials are acceptable in the installation of PRD discharge piping for heating and hot-water supply boilers? B31.9 or other codes may allow non-metallic material and questions have arisen from the field and from Jurisdictions.

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.

B31.9 and other ASME Codes will be reviewed.

d) TG Assigned

Project Manager:	Melissa Wadkinson
Members:	Donald Patten, Ken Watson, Stanley Konopacki, Brian Moore, Edward Wiggins

National Board Inspection Code Action item NB13-1002- Revision Dated 1/20/15

NB13-1002 - Part 2, SG Insp. Spec. – Review inspection requirements for B31.1 Power Piping. A Task Group consisting of Mike Schwartzwalder (Lead), Joe Frey, Venus Newton, Mark Mooney, Marshall Clark, Domenic Canonico, Mark Horbaczewski and Robbie Dobbins were assigned.

For Discussion, I propose the following additions to the Part 2- Inspection, 2013 edition Section 1.3 add paragraph 1.3(v) ASME B31.1, Power Piping, Chapter VII, Operation and Maintenance.

Add to Part 2- Section 9 Inspection, Glossary of Terms Definitions; 9.1 Definitions; **Covered piping systems (CPS):** These are piping systems on which condition assessments ~~are to~~ should be conducted. As a minimum for piping designed to B31.1, the CPS are to include NPS 4 and larger of the main steam, hot reheat, cold reheat steam and boiler feedwater systems. In addition to the above, CPS also includes NPS 4 and larger piping in other systems that operate above 750° F (400° C) or above 1025 psi (7100 kPa). The owner-user may include other piping systems.

Insert new Section 2.4.8 –Covered Piping Systems (CPS)

Covered piping systems are piping systems, designed to B31.1, on which conditions assessments ~~are to~~ should be conducted. It is recognized that all of the documentation, data and records listed in the following may not be available for a specific plant, particularly older plants. In these cases, the owner or user should ensure to the extent possible that Covered Piping Systems do not represent unnecessary safety risks.

a) In addition to boiler external piping, which is addressed under the original construction codes, the owner or user should consider establishing operation and maintenance procedures for ~~Covered Piping Systems~~ CPS which could fail as a result of creep, fatigue, wall thinning, corrosion fatigue and graphitization. The consequences of failure of CPS could pose a safety risk to personnel and equipment ~~result in death, injury and loss of property~~. The following guidance is provided as examples of written operation and maintenance procedures that owners or users prepare to ensure safe operation of these components;

1) Operation of piping systems within design limits,

2) Documentation of actual operating temperatures,

3) Documentation of significant system transients or excursions including thermal hydraulic events,

4) Documentation of alterations and repairs,

5) Documentation of maintenance of pipe supports for piping operating within the creep regime,

6) Documentation of maintenance of piping system elements such as vents, drains, relief valves, desuperheaters, and instrumentation necessary for safe operation,

7) Assessment of degradation mechanisms, including but not limited to creep, fatigue, graphitization, corrosion, erosion, and flow accelerated corrosion,

8) Quality of flow medium,

9) Documentation of the condition assessment, and

10) Other required maintenance

b) A condition assessment program should be established to provide assessment and documentation of the condition of all CPS. This program should contain (but not limited to) as many of the following elements as appropriate;

1) System name,

2) Listing of original material specifications and their editions,

3) Design diameters and wall thicknesses,

4) Design temperature and pressure,

5) Normal operating temperatures and pressures,

6) Operating hours, both cumulative and since last assessment,

7) Actual modes of operation since last condition assessment (such as number of hot, warm, and cold starts),

8) Pipe support hot and cold walkdown readings and conditions since last conditions assessment for piping systems that are operated within the creep regime,

9) Alterations and repairs since last condition assessment,

10) Description and list of any dynamic events, since last condition assessment,

11) Actual pipe wall thickness and outside diameter measurements since last condition assessment,

12) Summary of pipe system inspection findings including areas of concern, and

13) Recommendations for re-inspection interval.

c) Record of CPS should be maintained for the life of the piping system and should include those items listed in items a and b, applicable to the component, in addition to original as-built drawings, and repaired piping drawings.

d) It is also recommended that the owner or user should have a program, which documents pipe support readings, piping system displacements and modifications, which are taken during hot and cold walk downs. The owner or user should evaluate the effects of unexpected piping position changes, significant vibrations, and malfunctioning supports on the piping system's integrity and safety and record results and or corrective action taken in accordance with c).

~~d)~~e) Records of repairs or alterations to ~~Covered Piping Systems (CPS)~~ CPS shall be ~~recorded~~ documented on the applicable R form, if required, or another suitable document.

This action item is a result of PRC PR13-0209 from Francis Brown. His comment stated, " The NBIC is supposed to be a safety Code so why is a "good practice" only a "good practice" if required by a Jurisdiction. For example 2.2.10 6a) is or is not that paragraph a "good practice" mandatory, but without the Jurisdictional requirement a good practice is optional with the owner/user. This section should be revised to indicate "good practices" should be complied with but are mandatory when required by the Jurisdiction.

Instructions: If unable to submit electronically, please print this form and fax or mail. Print or type clearly.

Date: 12/10/12

Commenter Name: Francis Brown

Commenter Address: 1055 Crupper Avenue

Columbus, OH 43229

Commenter Phone: 614-431-3226

Commenter Fax: 614-431-3208

Commenter Email: fbrown@nationalboard.org

Section/Subsection Referenced: Part 2: 2.2.10.6

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

The NBIC is supposed to be a safety Code so why is a "good practice" only a "good practice" if required by a jurisdiction. For example: 2.2.10.6a) Is or is not that paragraph a good practice? A jurisdiction only makes a "good practice" mandatory, but without the jurisdictional requirement a good practice is optional with the owner/user. This section should be revised to indicate "good practices" should be complied with but are mandatory when required by the jurisdiction.

4.4.2 GENERAL REQUIREMENTS

a) Organizations or qualified individuals with experience in inspection, design, construction, repairs, or failure analysis of pressure-retaining items should be consulted to assist in identifying damage mechanisms, and to evaluate condition assessment results of pressure-retaining items. Documentation and inspection data used for fitness for service assessment should be evaluated for compliance, with codes, industry standards/ experience or good engineering practices, and shall be acceptable to the Jurisdiction. Understanding the operation of equipment or systems and interaction with their internal or external service environment is necessary to correctly identify damage mechanisms.

Response:
Section 2.2.10.6(a) does not appear to have a reference to “good practice” or “good engineering practice”. Several sections in the Code refer to “good engineering practice” as something that should be used. (see section 4.4.2) In these cases, it is ultimately up to the Jurisdiction to determine if they choose to make it a requirement / mandatory. No change is necessary.

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

4.6 CALCULATIONS

This Section describes review by the Inspector 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 ENGINEER EXPERIENCE

For quantitative engineering 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 3.2.4, 3.2.5, and 3.2.6 for design and calculations requirements for repairs and alterations.

4.6.1.2 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 inspector shall 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).

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

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 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 algorithm.

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.

SX.3 CHECKLIST

The following presents 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
b) The type of analysis (i.e. stress, static, dynamic, elastic, plastic, small or large deformations, heat transfer, etc.)
c) The modelling approach that will be used (solids, shells, simplification of geometry, mesh generation, solver technique, division into elements and element size, boundary restraints, etc.)
d) The geometries to be modeled (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 (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 (h, p , 2D, 3D), shape, and order (2^{nd} 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 the modulus was set to 1000 psi so that the component would not influence the mechanical model. Or, above 1200F 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, 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 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
d) ASME/API-579
e) Drawings
f) UDS
g) ASCE ~~7-05~~

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 liquefied gases. Owner-users should inspect static cryogenic vacuum-insulated storage tanks to ensure that the equipment is in safe serviceable condition.

Definition: 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:

Check that the following conditions or safe guards 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.
- 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) Comment: NFPA 55 already establishes requirements for the tank to be a set distance from openings and air intakes. These distances ensure ample time for spilled product to evaporate and dilute in the air. Containment walls are rarely used.
- 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.
- Protection is in place for the external vessel supports from leaking cryogenic fluid Comment: Proper drainage is the only protection afforded against leaking cryogenic fluid. No other protections are in place for most systems.
- Any gas from pressure relief devices or vents is discharged to a safe place.
- There is sufficient ventilation to avoid the formation of explosive gas-air mixtures or an oxygen deficient/enriched atmosphere.

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 nozzle attachments
- Check the vessel supports to make sure there is no 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, piping and accessories
- Check for abnormal frosting on outer vessel surface. Under normal usage, frost and ice will develop around pipes, valves, controls and vaporizers. Inspect the outer skin of the outer vessel for any new or abnormal signs of excessive frosting.

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. Comment: It is the position of the Compressed Gas Association that periodic pressure tests are not required for vacuum-jacketed cryogenic vessels. This is due to non-corrosive service, the performance history of existing tanks, and the excellent fracture toughness of the inner vessel material at cryogenic temperature. Please refer to CGA Position Statement PS-4. As for periodic vacuum tests; it is unwise to ever test vacuum once a tank is in service. Loss of vacuum is easily detected by observing frost forming on the outer vessel, or by the relief actuating. Testing vacuum is the most frequent cause of vacuum problems. So, vacuum tests are only performed when loss of vacuum is suspected, or when a vessel is being refurbished.

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 (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 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.

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) 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;

- Water leaks
- Ash Leaks
- Condition of insulation and lagging.
- Casing leaks or cracks
- Check 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 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.

Action Item Request Form

EXISTING LANGUAGE in 2013 NBIC Part 2

5.2 REPLACEMENT OF STAMPED DATA DURING INSERVICE INSPECTION

5.2.1 AUTHORIZATION

a) When the stamping on a pressure-retaining item becomes indistinct or the nameplate is lost, illegible, or detached, but traceability to the original pressure-retaining item is still possible, the Inspector shall instruct the owner or user to have the stamped data replaced. All re-stamping shall be done in accordance with the original code of construction, except as modified herein. Requests for permission to re-stamp or replace nameplates shall be made to the Jurisdiction in which the pressure-retaining item is installed. Application must be made on the ***Replacement of Stamped Data Form***, NB-136 (see NBIC Part 2, 5.3.2). Proof of the original stamping and other such data, as is available, shall be furnished with the request. Permission from the Jurisdiction is not required for the reattachment of nameplates that are partially attached. When traceability cannot be established, the Jurisdiction shall be contacted.

b) When there is no Jurisdiction, the replacement of stamped data shall be authorized and witnessed by a National Board Commissioned Inspector and the completed Form NB-136 shall be submitted to the National Board.

I propose the following revisions **to NBIC Part 2 paragraphs 5.2.1 (a) and 5.2.2 a)**

Stamped Data Form, NB-136 (see NBIC Part 2, 5.3.2). Proof of the original stamping and other such data, as is available, shall be furnished with the request. Permission from the Jurisdiction is not required for the reattachment of duplicate nameplates or nameplates that are partially attached. When traceability cannot be established, the Jurisdiction shall be contacted.

5.2.2 REPLACEMENT OF STAMPED DATA

a) The re-stamping or replacement of data shall be witnessed by a National Board Commissioned Inspector and shall be identical to the original stamping. The requirement to witness replacement of a duplicate nameplate may be waived if acceptable to the Jurisdiction.

JUSTIFICATION FOR CODE REVISION:

The NBIC does not seem to address replacement of "Duplicate" nameplates where the original nameplate is intact and attached to an inner vessel and may or may not be visible such as on a cryogenic vessel that has an inner and outer shell, the inner vessel being the actual pressure retaining item. It seems reasonable that since the AI is not required to witness a duplicate nameplate as addressed in ASME Section VIII Div 1 UG 119 (f), the AI should not be required to witness the replacement of a "Duplicate" nameplate or request permission from the Jurisdiction.

James P. Larson

OneCIS Insurance Co.

Remove 6.1 SCOPE

PART 2, SECTION 6
INSPECTION — SUPPLEMENTS

~~**6.1 SCOPE**~~

~~a) This Section contains detailed inspection requirements for specific pressure retaining items identified as Supplements.~~

~~b) Inspection of items described in these Supplements may include application of additional inspection requirements contained in other sections of NBIC Part 2.~~

~~c) Each Supplement is numbered in sequential order and follows the same numbering system used for the main text preceded by the letter "S." Each page of the Supplement will identify the Supplement name and number in the top heading.~~

In the roman numeral section of the NBIC it states:

Supplements
Supplements are contained in each Part of the NBIC to designate information pertaining only to a specific type of pressure-retaining item (e.g., Locomotive Boilers, Historical Boilers, Graphite Pressure Vessels.) Supplements follow the same numbering system used for the main text, preceded by the letter "S." Each page of the Supplement will identify the Supplement number and name in the top heading.

PROPOSED CHANGES – NBIC Part 2, SECTION 5 5.2 – 5.3.1

5.2 REPLACEMENT OF STAMPING OR NAMEPLATE ~~DURING INSERVICE INSPECTION~~

5.2.1 AUTHORIZATION

a) When the stamping on a pressure-retaining item becomes indistinct or the nameplate is lost, illegible, or detached, but traceability to the original pressure-retaining item is still possible, the Inspector shall instruct the owner or user to have the nameplate or stamped data replaced. All re-stamping shall be done in accordance with the original code of construction, except as modified herein. Requests for permission to re-stamp or replace nameplates shall be made to the Jurisdiction in which the ~~pressure-retaining item is installed.~~ nameplate or stamping is re-applied. Application must be made on the Replacement of Stamped Data Form, NB-136 (see 5.3.2). Proof of traceability to the original nameplate or stamping, and other such data~~,~~ as is available, shall be furnished with the request. Permission from the Jurisdiction is not required for the reattachment of nameplates that are partially attached. When traceability cannot be established, the Jurisdiction shall be contacted. The completed Form NB-136 (see 5.3.2) shall be submitted to the National Board.

b) When there is no Jurisdiction, the traceability shall be accepted and the replacement of the nameplate or stamped data shall be authorized and witnessed by a National Board Commissioned Inspector. ~~and t~~The completed Form NB-136 (see 5.3.2) shall be submitted to the National Board.

5.2.2 REPLACEMENT OF NAMEPLATE OR STAMPED DATA

a) The re-stamping or replacement of data shall be witnessed by a National Board Commissioned Inspector. ~~and shall be identical to the original stamping.~~

b) The Re-stamping or replacement of a code symbol stamp shall be performed only as permitted by the governing code of construction.

c) Replacement nameplates shall be clearly marked “replacement”.

5.2.3 REPORTING

Form NB-136 shall be filed with the Jurisdiction by the owner or user (if required) ~~or~~ and ~~t~~The National Board by the “R” Stamp Holder ~~owner or user together with~~ bearing a facsimile of the replacement stamping or nameplate, as applied, and shall also bear the signature of the “R” Stamp holder that performed the replacement and the National Board Commissioned Inspector who authorized and witnessed the replacement.

5.3 NATIONAL BOARD INSPECTION FORMS

5.3.1 SCOPE

The following forms (5.3.2 through 5.3.7.1) may be used for documenting specific requirements as indicated on the top of each form.

Note: Jurisdictions may have adopted other forms and may not accept these forms.

PROPOSED CHANGES TO FORM NB-136

REPLACEMENT OF STAMPED DATA FORM, NB-136

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

Submitted to:

_____
(name of jurisdiction)

_____
(address)

_____

_____
(telephone no)

Submitted by:

_____
(name of owner, user, or certificate holder)

_____
(address)

_____

_____
(telephone no)

1. Manufactured by _____
(name and address)
2. Manufactured for _____
(name and address)
3. Location of Installation _____
(address)
4. Date Installed _____
5. Previously installed at _____
6. Manufacturer's Data Report Attached ☐No ☐Yes
7. Item registered with National Board ☐No ☐Yes, NB Number _____
8. Item identification Year built _____

   Type _____ Dimensions _____

   Mfg. Serial no. _____ Jurisdiction no. _____

   MAWP _____psi Safety relief valve set at _____psi
9. Complete the reverse side of this report with a true facsimile of the legible portion of the nameplate or:
10. If nameplate is lost or illegible, traceability documentation, verified by the Inspector, shall be attached to this report. ~~identifying the object. to the Manufacturer's Data referenced on this form.~~

11. I request authorization to replace the stamped data and/or nameplate on the above described pressure-retaining item in accordance with the rules of the *National Board Inspection Code* (NBIC).

    ~~Owner or User's Organization Name~~
    "R" Certificate Holder's Name: _____ Number _____

    Signature _____ Date _____

    Title _____

    Verification of Traceability _____ NB Commission _____
    (Name of inspector)

12. Authorization is granted to replace the stamped data or to replace the nameplate of the above described pressure-retaining item.

    Signature _____ Date _____
    (chief inspector or authorized representative)

    Jurisdiction (if available) or NB Commission number _____

The following is a true facsimile of the legible portion of the item's original nameplate, (if available). Please print. Where possible, also attach a rubbing or picture of the nameplate.

The following is a true facsimile of the item's replacement stamping or nameplate

ADDED

I certify that to the best of my knowledge and belief, the statements in this report are correct, and that the replacement information, data, and identification numbers are correct and in accordance with provisions of the *National Board Inspection code*. ~~Attached is a facsimile or rubbing of the stamping or nameplate.~~

~~Name of Owner or User~~
"R" Certificate Holder _____ Number _____

Signature _____ Date _____
(Authorized representative)

Witnessed by _____ Employer _____
(Name of inspector)

Signature _____ Date _____ NB Commission _____
(Name of inspector)

(Back)

National Board of Boiler and Pressure Vessel Inspectors
National Board Inspection Code
Submission of Public Review Comment
2015 Draft Edition

PLEASE SUBMIT ONLY ONE COMMENT/RECOMMENDATION PER PAGE
Make additional copies as needed

Comments Must be Received No Later Than: October 13, 2014

Instructions: If unable to submit electronically, please print this form and fax or mail. Print or type clearly.

Date: October 7, 2014

Commenter Name: Nathan Carter

Commenter Address: HSB Global Standards, One State Street, PO Box 299
Hartford, CT 06141-0299

Commenter Phone: 860-722-5750

Commenter Fax:

Commenter Email: nathan_carter@hsbct.com

Section/Subsection Referenced: Part 2, S7.10 h)

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

Since a nameplate is required with a "R" stamp for the underground service change, was the requirement for an R-1/R-2 to be completed intentionally left off? Would it not be prudent for an Inspector to verify that the seal welding or flush patch welds comply at least visually comply with code? A "R" Certificate Holder is already required. Why not include an Inspector to verify the weld is acceptable and require a signed R-1/R-2 form, which is to be filed with the NB. There is a risk to life/property if a seal weld or flush patch on a LPG storage vessel is not completed in accordance with code requirements. Paragraph e) also introduces additional welding, which should be verified.

Also please consider a new item for Part 3, which would refer the reader to this Supplement for a Change of Service.

Source: ☒ Own Experience/Idea □ Other Source/Article/Code/Standard

Submit Form To: Robin Hough, Secretary, NBIC Committee, The National Board of Boiler & Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, OH 43229, fax 614-847-1828, email, rhough@nationalboard.org

NB Use Only

Commenter No. Issued: PR15-01

Comment No. Issued: 42

Project Committee Referred To: SC Inspection

National Board of Boiler and Pressure Vessel Inspectors
National Board Inspection Code
Submission of Public Review Comment
2015 Draft Edition

PLEASE SUBMIT ONLY ONE COMMENT/RECOMMENDATION PER PAGE
Make additional copies as needed

Comments Must be Received No Later Than: October 13, 2014

Instructions: If unable to submit electronically, please print this form and fax or mail. Print or type clearly.

Date: October 7, 2014

Commenter Name: Nathan Carter

Commenter Address: HSB Global Standards, One State Street, PO Box 299
Hartford, CT 06141-0299

Commenter Phone: 860-722-5750

Commenter Fax:

Commenter Email: nathan_carter@hsbct.com

Section/Subsection Referenced: Part 2, S7.10 k)

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

Part k) is silent concerning qualified welders. I don't believe the intent is for unqualified welders to be seal welding or welding flush patches to close off unused connections (d)) as well as welding the nameplate, especially since a qualified WPS is required. Consider requiring that the welder be qualified as specified in NBIC Part 3 2.2.3. Also, Consider providing more guidance to "stamp holder using a qualified welding procedure" by pointing the reader to Part 3. Consider changing this to "stamp holder using a qualified WPS or SWPS as specified in NBIC Part 3 2.2.1 and 2.2.2 respectfully."

Source: ☒ Own Experience/Idea □ Other Source/Article/Code/Standard

Submit Form To: Robin Hough, Secretary, NBIC Committee, The National Board of Boiler & Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, OH 43229, fax 614-847-1828, email, rhough@nationalboard.org

NB Use Only

Commenter No. Issued: PR15-01

Comment No. Issued: 43

Project Committee Referred To: SC Inspection

National Board of Boiler and Pressure Vessel Inspectors
National Board Inspection Code
Submission of Public Review Comment
2015 Draft Edition

PLEASE SUBMIT ONLY ONE COMMENT/RECOMMENDATION PER PAGE
Make additional copies as needed

Comments Must be Received No Later Than: October 13, 2014

Instructions: If unable to submit electronically, please print this form and fax or mail. Print or type clearly.

Date: October 7, 2014

Commenter Name: Nathan Carter

Commenter Address: HSB Global Standards, One State Street, PO Box 299
Hartford, CT 06141-0299

Commenter Phone: 860-722-5750

Commenter Fax:

Commenter Email: nathan_carter@hsbct.com

Section/Subsection Referenced: Part 2, S11.6, S11.7, S11.9

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

The Term "Examination" is used throughout S11.6, S11.7, and S11.9. Was this intended to ~~read "Inspection" instead, which is a duty of the Inspector?~~

S11.7. Should there be a Visual Acuity requirement?

Source: ☒ Own Experience/Idea □ Other Source/Article/Code/Standard

Submit Form To: Robin Hough, Secretary, NBIC Committee, The National Board of Boiler & Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, OH 43229, fax 614-847-1828, email, rhough@nationalboard.org

NB Use Only

Commenter No. Issued: PR15-07 Project Committee Referred To:

Comment No. Issued: 04 SC Inspection

National Board of Boiler and Pressure Vessel Inspectors
National Board Inspection Code
Submission of Public Review Comment
2015 Draft Edition

PLEASE SUBMIT ONLY ONE COMMENT/RECOMMENDATION PER PAGE
Make additional copies as needed

Comments Must be Received No Later Than: October 13, 2014

Instructions: If unable to submit electronically, please print this form and fax or mail. Print or type clearly.

Date: October 7, 2014

Commenter Name: Nathan Carter

Commenter Address: HSB Global Standards, One State Street, PO Box 299
Hartford, CT 06141-0299

Commenter Phone: 860-722-5750

Commenter Fax:

Commenter Email: nathan_carter@hsbct.com

Section/Subsection Referenced: Part 2, S11.10.2 another

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

S11.10 specifies very complex, details throughout. Would it not be prudent for the ~~Examiner to prepare a written procedure capturing all of the requirements in S11.10~~ as well as addressing all of the requirements in ASME Section V, Article 11? Would it also be prudent to require this procedure to be demonstrated to the Inspector also or at a minimum require that the procedure be available for review by the Inspector during his/her inspection cycle?

Source: ☒ Own Experience/Idea □ Other Source/Article/Code/Standard

Submit Form To: Robin Hough, Secretary, NBIC Committee, The National Board of Boiler & Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, OH 43229, fax 614-847-1828, email, rhough@nationalboard.org

NB Use Only

Commenter No. Issued: PR15-07

Comment No. Issued: 01

Project Committee Referred To: SC Inspection

National Board of Boiler and Pressure Vessel Inspectors
National Board Inspection Code
Submission of Public Review Comment
2015 Draft Edition

PLEASE SUBMIT ONLY ONE COMMENT/RECOMMENDATION PER PAGE
Make additional copies as needed

Comments Must be Received No Later Than: October 13, 2014

Instructions: If unable to submit electronically, please print this form and fax or mail. Print or type clearly.

Date: October 7, 2014

Commenter Name: Nathan Carter

Commenter Address: HSB Global Standards, One State Street, PO Box 299
Hartford, CT 06141-0299

Commenter Phone: 860-722-5750

Commenter Fax:

Commenter Email: nathan_carter@hsbct.com

Section/Subsection Referenced: Part 2, S11.10.2 and S11.10.6

Comment/Recommendation: *Proposed Solution:* □ New Text □X Revise Text □ Delete Text

The Title "Test Procedure" is used in both Sections S11.10.2 and S11.10.6 under S11.10 ~~Acoustic Emission Examination. Was it the intent to have "Test Procedure" listed twice~~ for Acoustic Emission. If not, suggest that these two paragraphs be consolidated. The latter is more detailed than the former.

Source: □X Own Experience/Idea □ Other Source/Article/Code/Standard

Submit Form To: Robin Hough, Secretary, NBIC Committee, The National Board of Boiler & Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, OH 43229, fax 614-847-1828, email, rhough@nationalboard.org

NB Use Only

Commenter No. Issued: PR15-07

Comment No. Issued: 02

Project Committee Referred To: SC Inspection

National Board of Boiler and Pressure Vessel Inspectors
National Board Inspection Code
Submission of Public Review Comment
2015 Draft Edition

PLEASE SUBMIT ONLY ONE COMMENT/RECOMMENDATION PER PAGE
Make additional copies as needed

Comments Must be Received No Later Than: October 13, 2014

Instructions: If unable to submit electronically, please print this form and fax or mail. Print or type clearly.

Date: October 7, 2014

Commenter Name: Nathan Carter

Commenter Address: HSB Global Standards, One State Street, PO Box 299
Hartford, CT 06141-0299

Commenter Phone: 860-722-5750

Commenter Fax:

Commenter Email: nathan_carter@hsbct.com

Section/Subsection Referenced: Part 2, S11.10.3

Comment/Recommendation: *Proposed Solution:* □ New Text □X Revise Text □ Delete Text

Which Edition of SNT-TC-1A and CP-189? Is any acceptable that addresses Acoustic ~~Emission Examination?~~

Last Sentence. How is the training and experience quantified? To whose satisfaction? How is this training and experience documented? I assume that the intent is that considerable training and experience be performed and not a 5 minute training session and ~~one examination interval be performed. Without quantifying this, what is there to~~ prevent this from occurring?

Source: □X Own Experience/Idea □ Other Source/Article/Code/Standard

Submit Form To: Robin Hough, Secretary, NBIC Committee, The National Board of Boiler & Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, OH 43229, fax 614-847-1828, email, rhough@nationalboard.org

NB Use Only

Commenter No. Issued: PR15-07

Comment No. Issued: 03

Project Committee Referred To: SC Inspection

National Board of Boiler and Pressure Vessel Inspectors
National Board Inspection Code
Submission of Public Review Comment
2015 Draft Edition

PLEASE SUBMIT ONLY ONE COMMENT/RECOMMENDATION PER PAGE
Make additional copies as needed

Comments Must be Received No Later Than: October 13, 2014

Instructions: If unable to submit electronically, please print this form and fax or mail. Print or type clearly.

Date: **10/04/2014**

Commenter Name: **Brian W. Moore, P.E.**

Commenter Address: **Hartford Steam Boiler**
One State St, P.O. Box 5024, Hartford, CT 06102

Commenter Phone: **860-722-5657**

Commenter Fax: **860-722-5530**

Commenter Email: **brian_moore@hsb.com**

Section/Subsection Referenced: **Part 2 Section 2.3.6.8**

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

Do not incorporate the proposed change – Establishing a mandatory (shall) inspection requirement based on another inspection code is beyond the scope of the NBIC. To my knowledge, no other inspection code has ever been made mandatory under the NBIC. If inspection requirements are needed then one of two things should be done: 1) let individual jurisdictions set the requirements, or 2) within the NBIC include specific inspection requirements consistent with pressure vessels constructed to ASME Section VIII and ASME PVHO-1. An alternative to including specific requirements within the NBIC would be to change the text to: "Inspections may be conducted using ASME PVHO-2 for reference." It must be clear that the requirements of PVHO-2 are not a mandatory part of an NBIC inspection. See for example, PVHO-2 Section 4.0. None of the responsibilities listed include a commissioned boiler inspector. Even Section 7 states that there are various types of inspections. "Operational Inspections" are definitely beyond the scope and capabilities of a commissioned inspector.

Source: ☒ Own Experience/Idea ☐ Other Source/Article/Code/Standard

Submit Form To: Robin Hough, Secretary, NBIC Committee, The National Board of Boiler & Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, OH 43229, fax 614-847-1828, email, rhough@nationalboard.org

NB Use Only

Commenter No. Issued: PR15-02

Comment No. Issued: 04

Project Committee Referred To: SC on Inspection

National Board of Boiler and Pressure Vessel Inspectors
National Board Inspection Code
Submission of Public Review Comment
2015 Draft Edition

PLEASE SUBMIT ONLY ONE COMMENT/RECOMMENDATION PER PAGE
Make additional copies as needed

Comments Must be Received No Later Than: October 13, 2014

Instructions: If unable to submit electronically, please print this form and fax or mail. Print or type clearly.

Date: **October 13, 2014**

Commenter Name: **Kenneth A. Stoller - American Insurance Association (AIA)**

Commenter Address: **2101 L Street NW, Suite 400**

Washington, DC 20037

Commenter Phone: **202-828-7167**

Commenter Fax: **202-495-7866**

Commenter Email: **kstoller@aiadc.org**

Section/Subsection Referenced: **Part 2, Section 2.3.6.8**

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

While AIA supports the concepts underlying PVHO-2, we oppose its adoption as an in-service inspection standard. The requirements of PVHO-2 are addressed to owner/operators, not inspectors, and go well 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. Accordingly, we recommend leaving this section unamended.

Source: ☒ Own Experience/Idea ☐ Other Source/Article/Code/Standard _____

Submit Form To: Robin Hough, Secretary, NBIC Committee, The National Board of Boiler & Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, OH 43229, fax 614-847-1828, email, rhough@nationalboard.org

NB Use Only

Commenter No. Issued: PR15-06 Project Committee Referred To:

Comment No. Issued: 01 SC Inspection

National Board of Boiler and Pressure Vessel Inspectors
National Board Inspection Code
Submission of Public Review Comment
2015 Draft Edition

PLEASE SUBMIT ONLY ONE COMMENT/RECOMMENDATION PER PAGE
Make additional copies as needed

Comments Must be Received No Later Than: October 13, 2014

Instructions: If unable to submit electronically, please print this form and fax or mail. Print or type clearly.

Date: **October 13, 2014**

Commenter Name: **Robert Wielgoszinski**

Commenter Address: **HSB Global Standards**

One State Street, Hartford, CT 06060

Commenter Phone: **860-722-5064**

Commenter Fax: **860-722-5505**

Commenter Email: **Robert_wielgoszinski@hsbct.com**

Section/Subsection Referenced: **Part 2, paragraph 2.3.6.8**

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

Inspections that are specified by the NBIC should be performed in accordance with the NBIC, and not be performed to other Codes or Standards. The specific details for inspection should be extracted from the standard and written into the NBIC. This places the NBIC in control of which inspections they need performed. This paragraph should be withheld from publication in the NBIC until revised to specify the inspections needed.

Source: ☒ Own Experience/Idea ☐ Other Source/Article/Code/Standard _____

Submit Form To: Robin Hough, Secretary, NBIC Committee, The National Board of Boiler & Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, OH 43229, fax 614-847-1828, email, rhough@nationalboard.org

NB Use Only

Commenter No. Issued:PR15-04 _____ Project Committee Referred To:

Comment No. Issued: **01** **SC Inspection**

National Board of Boiler and Pressure Vessel Inspectors
National Board Inspection Code
Submission of Public Review Comment
2015 Draft Edition

PLEASE SUBMIT ONLY ONE COMMENT/RECOMMENDATION PER PAGE
Make additional copies as needed

Comments Must be Received No Later Than: October 13, 2014

Instructions: If unable to submit electronically, please print this form and fax or mail. Print or type clearly.

Date: **October 13, 2014**

Commenter Name: **Kenneth A. Stoller - American Insurance Association (AIA)**

Commenter Address: **2101 L Street NW, Suite 400**

Washington, DC 20037

Commenter Phone: **202-828-7167**

Commenter Fax: **202-495-7866**

Commenter Email: **kstoller@aiadc.org**

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.

Source: ☒ Own Experience/Idea ☐ Other Source/Article/Code/Standard _____

Submit Form To: Robin Hough, Secretary, NBIC Committee, The National Board of Boiler & Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, OH 43229, fax 614-847-1828, email, rhough@nationalboard.org

NB Use Only

Commenter No. Issued: PR15-06 Project Committee Referred To:

Comment No. Issued: 02 SC Inspection

National Board of Boiler and Pressure Vessel Inspectors
National Board Inspection Code
Submission of Public Review Comment
2015 Draft Edition

PLEASE SUBMIT ONLY ONE COMMENT/RECOMMENDATION PER PAGE
Make additional copies as needed

Comments Must be Received No Later Than: October 13, 2014

Instructions: If unable to submit electronically, please print this form and fax or mail. Print or type clearly.

Date: **10/04/2014**

Commenter Name: **Brian W. Moore, P.E.**

Commenter Address: **Hartford Steam Boiler**
One State St, P.O. Box 5024, Hartford, CT 06102

Commenter Phone: **860-722-5657**

Commenter Fax: **860-722-5530**

Commenter Email: **brian_moore@hsb.com**

Section/Subsection Referenced: **Part 2 Supplemnt 10 S10.3 a)**

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

Delete S10.2 a) This is unenforceable language and beyond the scope of knowledge of a National Board Commissioned inspector. The word "permanent" is undefined and beyond the knowledge of a commissioned inspector to determine. There can be no uniform and consistant interpretation of "permanent."

Source: ☒ Own Experience/Idea ☐ Other Source/Article/Code/Standard _____

Submit Form To: Robin Hough, Secretary, NBIC Committee, The National Board of Boiler & Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, OH 43229, fax 614-847-1828, email, rhough@nationalboard.org

NB Use Only

Commenter No. Issued: PR15-02 Project Committee Referred To:

Comment No. Issued: **05** SC Inspection

National Board of Boiler and Pressure Vessel Inspectors
National Board Inspection Code
Submission of Public Review Comment
2015 Draft Edition

PLEASE SUBMIT ONLY ONE COMMENT/RECOMMENDATION PER PAGE
Make additional copies as needed

Comments Must be Received No Later Than: October 13, 2014

Instructions: If unable to submit electronically, please print this form and fax or mail. Print or type clearly.

Date: **10/04/2014**

Commenter Name: **Brian W. Moore, P.E.**

Commenter Address: **Hartford Steam Boiler**
One State St, P.O. Box 5024, Hartford, CT 06102

Commenter Phone: **860-722-5657**

Commenter Fax: **860-722-5530**

Commenter Email: **brian_moore@hsb.com**

Section/Subsection Referenced: **Part 2 Supplemnt 10 S10.2 d)**

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

Delete S10.2 d) This is unenforceable language and beyond the scope of knowledge of a National Board Commissioned inspector. The expression "safely supported" is undefined and beyond the knowledge of a commissioned inspector to determine. If "safely supported" means chained to the wall with a lock, then this subparagraph should so state, otherwise there can be no uniform and consistant interpretation of "safety supported".

Source: ☒ Own Experience/Idea ☐ Other Source/Article/Code/Standard _____

Submit Form To: Robin Hough, Secretary, NBIC Committee, The National Board of Boiler & Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, OH 43229, fax 614-847-1828, email, rhough@nationalboard.org

NB Use Only

Commenter No. Issued: PR15-02 Project Committee Referred To:

Comment No. Issued: **06** **SC Inspection**

National Board of Boiler and Pressure Vessel Inspectors
National Board Inspection Code
Submission of Public Review Comment
2015 Draft Edition

PLEASE SUBMIT ONLY ONE COMMENT/RECOMMENDATION PER PAGE
Make additional copies as needed

Comments Must be Received No Later Than: October 13, 2014

Instructions: If unable to submit electronically, please print this form and fax or mail. Print or type clearly.

Date: **10/04/2014**

Commenter Name: **Brian W. Moore, P.E.**

Commenter Address: **Hartford Steam Boiler**
One State St, P.O. Box 5024, Hartford, CT 06102

Commenter Phone: **860-722-5657**

Commenter Fax: **860-722-5530**

Commenter Email: **brian_moore@hsb.com**

Section/Subsection Referenced: **Part 2 Supplemnt 10 S10.2 f)**

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

Delete S10.2 f) This is unenforceable language and beyond the scope of knowledge of a National Board Commissioned inspector. The word "guarded" is undefined and beyond the knowledge of a commissioned inspector to determine. If "guarded" means a 6" diameter steel pipe, filled with concrete, and buried 3' onto the ground, then this subparagraph should so state, otherwise there can be no uniform and consistant interpretation of "guarded".

Source: ☒ Own Experience/Idea ☐ Other Source/Article/Code/Standard _____

Submit Form To: Robin Hough, Secretary, NBIC Committee, The National Board of Boiler & Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, OH 43229, fax 614-847-1828, email, rhough@nationalboard.org

NB Use Only

Commenter No. Issued: PR15-02 Project Committee Referred To:

Comment No. Issued: **07** **SC Inspection**

National Board of Boiler and Pressure Vessel Inspectors
National Board Inspection Code
Submission of Public Review Comment
2015 Draft Edition

PLEASE SUBMIT ONLY ONE COMMENT/RECOMMENDATION PER PAGE
Make additional copies as needed

Comments Must be Received No Later Than: October 13, 2014

Instructions: If unable to submit electronically, please print this form and fax or mail. Print or type clearly.

Date: **10/04/2014**

Commenter Name: **Brian W. Moore, P.E.**

Commenter Address: **Hartford Steam Boiler**
One State St, P.O. Box 5024, Hartford, CT 06102

Commenter Phone: **860-722-5657**

Commenter Fax: **860-722-5530**

Commenter Email: **brian_moore@hsb.com**

Section/Subsection Referenced: **Part 2 Supplemnt 10 S10.3 a)**

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

Delete S10.2 a) This is unenforceable language and beyond the scope of knowledge of a National Board Commissioned inspector. The word "permanent" is undefined and beyond the knowledge of a commissioned inspector to determine. There can be no uniform and consistant interpretation of "permanent."

Source: ☒ Own Experience/Idea ☐ Other Source/Article/Code/Standard

Submit Form To: Robin Hough, Secretary, NBIC Committee, The National Board of Boiler & Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, OH 43229, fax 614-847-1828, email, rhough@nationalboard.org

NB Use Only

Commenter No. Issued: PR15-02 Project Committee Referred To:

Comment No. Issued: 08 SC Inspection

National Board of Boiler and Pressure Vessel Inspectors
National Board Inspection Code
Submission of Public Review Comment
2015 Draft Edition

PLEASE SUBMIT ONLY ONE COMMENT/RECOMMENDATION PER PAGE
Make additional copies as needed

Comments Must be Received No Later Than: October 13, 2014

Instructions: If unable to submit electronically, please print this form and fax or mail. Print or type clearly.

Date: **10/04/2014**

Commenter Name: **Brian W. Moore, P.E.**

Commenter Address: **Hartford Steam Boiler**
One State St, P.O. Box 5024, Hartford, CT 06102

Commenter Phone: **860-722-5657**

Commenter Fax: **860-722-5530**

Commenter Email: **brian_moore@hsb.com**

Section/Subsection Referenced: **S10.5 Gas Detection Systems**

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

National Board Commissioned inspectors do not inspect to NIOSH or ACGIH documents. It is not appropriate to cite these as mandatory, which is how this subparagraph will be interpreted. Commissioned inspectors are not qualified to determine whether a detector is set to alarm at any particular concentration.

Source: ☒ Own Experience/Idea ☐ Other Source/Article/Code/Standard _____

Submit Form To: Robin Hough, Secretary, NBIC Committee, The National Board of Boiler & Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, OH 43229, fax 614-847-1828, email, rhough@nationalboard.org

NB Use Only

Commenter No. Issued: PR15-02 Project Committee Referred To:

Comment No. Issued: **09** **SC Inspecction**

National Board of Boiler and Pressure Vessel Inspectors
National Board Inspection Code
Submission of Public Review Comment
2015 Draft Edition

PLEASE SUBMIT ONLY ONE COMMENT/RECOMMENDATION PER PAGE
Make additional copies as needed

Comments Must be Received No Later Than: October 13, 2014

Instructions: If unable to submit electronically, please print this form and fax or mail. Print or type clearly.

Date: **10/04/2014**

Commenter Name: **Brian W. Moore, P.E.**

Commenter Address: **Hartford Steam Boiler**
One State St, P.O. Box 5024, Hartford, CT 06102

Commenter Phone: **860-722-5657**

Commenter Fax: **860-722-5530**

Commenter Email: **brian_moore@hsb.com**

Section/Subsection Referenced: **Part 2 Supplemnt 10 S10.6**

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

Delete S10.6. Verifying signage is beyond what in-service commissioned inspectors are chartered to do. Such signage is within the purview of OSHA for a safe work environment for employees. Commissioned in-service inspectors do inspect to any requirements of OSHA. In addition, the in-service inspectors are not qualified to determine the setpoint of any alarms. This entire section should be deleted.

Source: ☒ Own Experience/Idea ☐ Other Source/Article/Code/Standard _____

Submit Form To: Robin Hough, Secretary, NBIC Committee, The National Board of Boiler & Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, OH 43229, fax 614-847-1828, email, rhough@nationalboard.org

NB Use Only

Commenter No. Issued: PR15-02 Project Committee Referred To:

Comment No. Issued: **10** SC Inspection

National Board of Boiler and Pressure Vessel Inspectors
National Board Inspection Code
Submission of Public Review Comment
2015 Draft Edition

PLEASE SUBMIT ONLY ONE COMMENT/RECOMMENDATION PER PAGE
Make additional copies as needed

Comments Must be Received No Later Than: October 13, 2014

Instructions: If unable to submit electronically, please print this form and fax or mail. Print or type clearly.

Date: **10/04/2014**

Commenter Name: **Brian W. Moore, P.E.**

Commenter Address: **Hartford Steam Boiler**

One State St, P.O. Box 5024, Hartford, CT 06102

Commenter Phone: **860-722-5657**

Commenter Fax: **860-722-5530**

Commenter Email: **brian_moore@hsb.com**

Section/Subsection Referenced: **Part 2 Supplemnt 10 S10.7**

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

Delete S10.7. The materials specifications are beyond what a commissioned in-service can verify. Valves, piping, tubing, and fittings may not be visibly marked for such verification. Further, the inspector cannot verify S10.7 a)3) "…the working pressure of the applicable circuit in the system…" The caution is not enforceable language for an inspector: "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." In S10.7 d) the length of a vent line cannot be reasonable determined by an in-service inspect. Tracing a line with a tape measure to determine its length is not practical or reasonable. Finally, the tables reference a "Fire Flow Rate" which is a manufacturer/user determined rating under Section VIII. This entire section, including the tables, should be deleted.

Source: ☒ Own Experience/Idea ☐ Other Source/Article/Code/Standard _____

Submit Form To: Robin Hough, Secretary, NBIC Committee, The National Board of Boiler & Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, OH 43229, fax 614-847-1828, email, rhough@nationalboard.org

NB Use Only

Commenter No. Issued: ____PR15-02_____ Project Committee Referred To:

Comment No. Issued: **11** _____ **SC Inspection**

National Board of Boiler and Pressure Vessel Inspectors
National Board Inspection Code
Submission of Public Review Comment
2015 Draft Edition

PLEASE SUBMIT ONLY ONE COMMENT/RECOMMENDATION PER PAGE
Make additional copies as needed

Comments Must be Received No Later Than: October 13, 2014

Instructions: If unable to submit electronically, please print this form and fax or mail. Print or type clearly.

Date: **October 13, 2014**

Commenter Name: **Robert Wielgoszinski**

Commenter Address: **HSB Global Standards**

One State Street, Hartford, CT 06060

Commenter Phone: **860-722-5064**

Commenter Fax: **860-722-5505**

Commenter Email: **Robert_wielgoszinski@hsbct.com**

Section/Subsection Referenced: **Part 2, Supplement 10**

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

Much of Supplement 10 contains requirements for inspection of equipment or systems that are outside the scope of the insurance policies that insurance companies issue. If these inspections are mandated by the Jurisdiction, then the inspectors employed by these insurance companies will be forced to make inspections in where they have no business interest. Further, this puts indefensible liability on the Inspector and his/her employer. I recommend either deleting this Supplement from the 2015 edition and rework it to be more guidance related then requirement based, or add a suitable disclaimer in the Scope paragraph, S10.1, that would exempt Inspector conformance to this supplement if carbon dioxside systems or parts thereof, are not within the employer's scope of activity.

Source: ☒ Own Experience/Idea ☐ Other Source/Article/Code/Standard _____

Submit Form To: Robin Hough, Secretary, NBIC Committee, The National Board of Boiler & Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, OH 43229, fax 614-847-1828, email, rhough@nationalboard.org

NB Use Only

Commenter No. Issued: PR15-04 Project Committee Referred To:

Comment No. Issued: 02 Inspection

Action Item NB15-1405 from Request for Interpretation

Robert V. Wielgoszinski
Hartford Steam Boiler of CT

Item	NB15-1405 *(was IN 14-0401)*
Purpose	Code Interpretation & possible revision to present Code rules
Scope:	Repairs and alterations to vessels constructed of ferritic materials with tensile properties enhanced by heat treatment, i.e. Part UHT material.
Background	During the construction of liquid propane vessels it is typical to use SA-517 Gr. E (P-No. 11B) for use as heads and shells for propane transport tanks. The ASME Code requires the base materials, welding materials, and the WPS's to be qualified with impact tests. Also, the Code requires production impact testing to be performed. This is where the actual vessel material, actual filler materials, are welded with the actual WPS to be used in production, and the weld coupon is impact tested to meet the specified results of Section VIII. To do so, the Manufacturer of the vessel is sure to purchase enough extra base and filler material to perform these tests. When repairs / alterations are made to these vessels the NBIC requires the rules of the original construction Code to be followed. As such, any new material to be added to a vessel or any WPS's used or any filler metal used for the repair must then be impact tested and meet the results stated in Section VIII. Also, production impacts must therefore be made since this is a mandatory Section VIII requirement. This is usually accomplished by making a weld coupon out of existing material cut from the vessel and welding it to the new material to be added to the vessel, and then impact testing specimens from that coupon. But, not all repairs / alterations lend themselves the ability to take existing material from the vessel. If a small nozzle is added to the vessel, only a few inches of material is taken from the vessel. Or say a crack is to be weld repaired or there is weld metal build up to be made on some worn or wasted area. Then there is no extra material to be taken away from the vessel to run coupons for production impacts. Strict interpretation of the ASME Code would now require a piece of steel to be removed to run production impacts and then a flush patch installed over the area removed. Some individuals look at the words in NBIC, Part 3, Section 1, paragraph 1.2, where it says, "...the standard governing the original construction shall conform, insofar as possible..." gives one the leeway to not require production impacts because it's not possible. Others indicated that it is possible but not practical to cut perfectly good material out of a vessel when there is no need to. And others will say that the ASME clearly requires existing material to be removed to run impact tests. One thing is clear though, and that is there is lack of uniformity in applying these rules. So we are looking to the NBIC to provide some guidance in this matter. The

	Jurisdiction in this case is the US DOT, and 49CFR Chapter 1 § 180.413(a)(1) states that the NBIC is to be followed for repairs and modifications. DOT is also looking to the NBIC for clarification. Depending on the responses to the inquiry it may be prudent revise the Code to be more specific in this area of UHT materials.
Proposed Questions	**Question 1:** The NBIC Part 3 paragraph 1.2 states that a repair shall be carried out "insofar as possible to the section and edition of the ASME code most applicable to the work planned." If a vessel is constructed using SA-517-E (P-11B) material to ASME Section VIII Div. 1, where production and weld procedure impact tests were required during construction, would a repair to a crack in the shell require production and weld procedure impact testing under the NBIC? **Proposed Reply 1:** Yes. **Question 2:** If the answer to Question 1 is yes and there was no SA-517-E material from the original lot available, would the repair require the addition of new base material (e.g. a flush patch around the area of the crack) so that production impact tests could be performed with the original base metal to the new base metal? **Proposed Reply 1:** Yes. **Question 3:** If the vessel described in Question 1 was to be altered by adding an SA-675 (P-1) pump flange to the shell, would production and weld procedure impact tests be required using the same lot P-1 and P-11B base materials as used in the alteration? **Proposed Reply 1:** Yes.

NBIC Interpretation Final 1/22/2015

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, Postweld Heat Treatment of a Vessel

Committee Question 1

An R-Certificate holder decides to perform postweld 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.

NB15-0101
Seal Welding Handholes & Plugs

Subject: Seal welding of handhole covers NBIC, Part 3, Paragraph 3.3.2 (e)?

Question: Is seal welding of inspection opening covers, such as handhole plates or plugs, considered a routine repair?

Reply: No.

NBIC Subcommittee R&A Action Block

Subject	Gasketed Plate Heat Exchangers		
File Number	NB12-0801	**Prop. on Pg.**	1 thru 9
Proposed Revision	Add examples of routine repairs, repairs, and alterations for gasketed plate heat exchangers and revise R-1 form to include gasketed PHEs.		
Statement of Need	Because of the unique design of the PHE, the current ASME Pressure Vessel and NBIC Codes do not specific ally address the design of PHE's, nor the potential r epairs or alterati ons. This is intended to provide guidance to the industry and the Jurisdictions.		
Project Manager	Ed Ortman		

SubGroup	R&A Specific		
SubGroup Negatives		**SG Meeting Date**	July 16, 2013

SubCommittee Negatives		**SC Meeting Date**	July 17, 2013

3.2.5 CALCULATIONS

For alterations, calculations shall be completed prior to the start of any physical work. All design calculations shall be completed by an organization experienced in the design portion of the standard used for construction of the item. All calculations shall be made available for review by the Inspector accepting the design.

3.2.6 REFERENCE TO OTHER CODES AND STANDARDS

Other codes, standards, and practices pertaining to the repair and alteration of pressure retaining items can provide useful guidance. Use of these codes, standards and practices is subject to review and acceptance by the Inspector, and when required, by the Jurisdiction. The user is cautioned that the referenced codes, standards and practices may address methods categorized as repairs; however, some of these methods are considered alterations by the NBIC.

In the event of a conflict with the requirements of the NBIC, the requirements of the NBIC take precedence. Some examples are as follows:

(a) National Board *Bulletin* - National Board Classic Articles Series;

(b) ASME PCC-1, Guidelines for Pressure Boundary Bolted Flange Joint Assembly;

(c) ASME PCC-2, Repair of Pressure Equipment and Piping.

3.3 REPAIRS TO PRESSURE-RETAINING ITEMS

3.3.1 DEFECT REPAIRS

Before a repair is made to a defect in a welded joint or base metal, care should be taken to investigate its cause and to determine its extent and likelihood of recurrence.

3.3.2 ROUTINE REPAIRS

a) Routine repairs are repairs for which the requirements for in-process involvement by the Inspector and stamping by the "R" Certificate Holder may be waived as determined appropriate by the Jurisdiction and the Inspector. All other applicable requirements of this Code shall be met. Prior to performing routine repairs, the "R" Certificate Holder should determine that routine repairs are acceptable to the Jurisdiction where the pressure-retaining item is installed;

b) The Inspector, with the knowledge and understanding of jurisdictional requirements, shall be responsible for meeting jurisdictional requirements and the requirements of this Code;

c) The "R" Certificate Holder's Quality System Program shall describe the process for identifying, controlling, and implementing routine repairs. Routine repairs shall be documented on Form R-1 with this statement in the Remarks section: "Routine Repair.";

d) Repairs falling within one or more of the following categories may be considered routine:

1) Welded repairs or replacements of valves, fittings, tubes, or pipes NPS 5 (DN 125) in diameter and smaller, or sections thereof, where neither postweld heat treatment nor NDE other than visual is re-

5) The following on gasketed plate heat exchangers:
   i) Removal and replacement of heat transfer plates identical to those listed on the Manufacturer's Data Report;
   ii) In kind replacement of tightening bolts;
   iii) A change in welded attachments (e.g. welded feet).

3) Weld buildup of wasted areas in heads and shells not exceeding an area of 100 sq. inches (64,520 sq. mm) or a thickness of 25% of nominal wall thickness or ½ inch (13 mm), whichever is less; A11

4) Corrosion resistance weld overlay not exceeding 100 sq. in. (64,520 sq. mm).

3.3.3 EXAMPLES OF REPAIRS

a) Weld repairs or replacement of pressure parts or attachments that have failed in a weld or in the base material;

b) The addition of welded attachments to pressure parts, such as:

   1) Studs for insulation or refractory lining;

   2) Hex steel or expanded metal for refractory lining;

   3) Ladder clips;

   4) Brackets having loadings that do not affect the design of the pressure-retaining item to which they are attached; and

   5) Tray support rings.

c) Corrosion resistant strip lining, or weld overlay;

d) Weld buildup of wasted areas;

e) Replacement of heat exchanger tubesheets in accordance with the original design;

f) Replacement of boiler and heat exchanger tubes where welding is involved;

g) In a boiler, a change in the arrangement of tubes in furnace walls, economizers, or super heater sections;

h) Replacement of pressure-retaining parts identical to those existing on the pressure-retaining item and described on the original *Manufacturer's Data Report*. For example:

   1) Replacement of furnace floor tubes and/or sidewall tubes in a boiler;

   2) Replacement of a shell or head in accordance with the original design;

   3) Rewelding a circumferential or longitudinal seam in a shell or head;

   4) Replacement of nozzles of a size where reinforcement is not a consideration;

i) Installation of new nozzles or openings of such a size and connection type that reinforcement and strength calculations are not a consideration required by the original code of construction;

j) The addition of a nozzle where reinforcement is a consideration may be considered to be a repair, provided the nozzle is identical to one in the original design, located in a similar part of the vessel, and not closer than three times its diameter from another nozzle. The addition of such a nozzle shall be restricted by any service requirements;

k) The installation of a flush patch to a pressure-retaining item;

l) The replacement of a shell course in a cylindrical pressure vessel;

m) Welding of gage holes;

n) Welding of wasted or distorted flange faces;

o) Replacement of slip-on flanges with weld neck flanges or vice versa;

p) Seal welding of buttstraps and rivets;

q) Subject to the administrative procedures of the Jurisdiction and approval of the Inspector, the replacement of a riveted section or part by welding;

r) The repair or replacement of a pressure part with a code-accepted material that has a nominal composition and strength that is equivalent to the original material, and is suitable for the intended service; and

s) Replacement of a pressure-retaining part with a material of different nominal composition, 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.*

t) The replacement of a Pressure Relieving Device (PRD) attached by welding, provided the replacement device's relieving capacity is equal to or greater than the PRD-capacity required by the original code of construction.

3.3.4 REPAIR METHODS

u) In a gasketed plate heat exchanger:
1) Weld repair of any pressure part (e.g. nozzle repair or in kind replacement of nozzle);
2) In kind replacement of frame or pressure plates.

Except as provided in NBIC Part 3, 3.3.4.8, a repair or a defect in a welded joint or base material shall not be made until the defect has been removed. A suitable Nondestructive Examination (NDE) method, such as Magnetic Particle (MT) or Liquid Penetrant (PT), may be necessary to ensure complete removal of the defect. If the defect penetrates the full thickness of the material, the repair shall be made with a full penetration weld such as a double buttweld or single buttweld with or without backing. Where circumstances indicate that the defect is likely to recur, consideration should be given to removing the defective area and installing a flush patch or taking other corrective measures acceptable to the Inspector, and when required, by the Jurisdiction.

3.4 ALTERATIONS

3.4.1 RE-RATING[10]

Re-rating of a pressure-retaining item by increasing the maximum allowable working pressure (internal or external) or temperature or decreasing the minimum design metal temperature below which notch toughness testing is required by the original code of construction, shall be done only after the following requirements have been met to the satisfaction of the Jurisdiction at the location of the installation:

a) Revised calculations verifying the new service conditions shall be prepared in accordance with the "R" Certificate Holder's Quality Control System. Establishing a higher joint efficiency to re-rate a pressure-retaining item is not permitted;

b) All re-ratings shall be established in accordance with the requirements of the construction standard to which the pressure-retaining item was built;

c) Current inspection records verify that the pressure-retaining item is satisfactory for the proposed service conditions;

d) The pressure-retaining item has been pressure tested, as required, for the new service conditions. Any insulation, coatings, or coverings that may inhibit or compromise a meaningful pressure test shall be removed, to the extent identified by the Inspector;

e) In lieu of pressure testing, alternative methods can be used to ensure the structural integrity of the re-rated pressure-retaining item. The alternative methods shall be documented and subject to review and approval by the Jurisdiction.

3.4.2 ALTERATIONS BASED ON ALLOWABLE STRESS VALUES

For re-rating or re-calculating a new minimum wall thickness for a pressure-retaining item using a later edition/addenda of the original code of construction or selected construction standard or code that permits use of higher allowable material stress values than were used in the original construction, the following requirements shall apply:

a) The "R" Certificate Holder shall verify, by calculations and other means, that the re-rated item can be satisfactorily operated at the new service condition (e.g., stiffness, buckling, external mechanical loadings);

b) The pressure-retaining item shall not be used in lethal service;

c) The pressure-retaining item shall not be used in high-cycle operation or fatigue service (i.e., loadings other than primary membrane stress are controlling design considerations) unless the pressure-retaining item was originally designed for fatigue service and a fatigue analysis is performed;

d) The pressure-retaining item shall have been constructed to the 1968 edition or later edition/addenda of the original code of construction;

e) The pressure-retaining item shall be shown to comply with all relevant requirements of the edition/addenda of the code of construction, which permits the higher allowable stress values (e.g., reinforcement, toughness, examination, pressure testing);

10 Re-rating: Except as provided for Yankee Dryers in Supplement 5, this code does not provide rules for de-rating boilers or pressure vessels; however, when the MAWP and/or allowable temperature of a boiler or pressure vessel is reduced, the Jurisdiction where the object is installed should be contacted to determine if specific procedures should be followed.

f) The pressure-retaining item shall have a satisfactory operating history and current inspection of the pressure-retaining item shall verify the item exhibits no unrepaired damage (e.g., cracks, corrosion, erosion). Areas of corrosion or erosion may be left in place provided the remaining wall thickness is greater than the minimum thickness for the new design conditions;

g) The re-rating shall be acceptable to the Inspector and, where required, the Jurisdiction;

h) All other requirements of Part 3, as applicable, and jurisdictional requirements shall be met;

i) Use of this paragraph shall be documented in the Remarks section of Form R-2.

3.4.3 EXAMPLES OF ALTERATIONS

a) An increase in the maximum allowable working pressure (internal or external) or temperature of a pressure-retaining item regardless of whether or not a physical change was made to the pressure-retaining item;

b) A decrease in the minimum temperature;

c) The addition of new nozzles or openings in a boiler or pressure vessel except those classified as repairs;

d) A change in the dimensions or contour of a pressure-retaining item;

e) In a boiler, an increase in the heating surface or steaming capacity as described on the original Manufacture's Data Report;

f) The addition of a pressurized jacket to a pressure vessel;

g) Except as permitted in NBIC, Part 3, 3.3.3 s);

h) Replacement of a pressure-retaining part in a pressure-retaining item with a material of different allowable stress or nominal composition from that used in the original design; and

i) The addition of a bracket or an increase in loading on an existing bracket that affects the design of the pressure-retaining item to which it is attached.

j) The replacement of a Pressure Relieving Device (PRD) as a result of work completed on a Pressure-Retaining Item (PRI) that changes the resultant capacity to exceed the Minimum Required Relieving Capacity (MRRC) required by the original code of construction as described on the original Manufacturer's Data Report.

3.4.4 ALTERATION OF ASME CODE SECTION VIII, DIVISION 2 OR 3, PRESSURE VESSELS

k) The following on gasketed plate heat exchangers:
   a) A change in heat transfer plate material;
   b) A change in thickness of heat transfer plates;
   c) A change in tightening bolt material or grade;
   d) A change in tightening bolt diameter
   e) A change in the material or thickness of the frame plate of pressure plates.

The alteration plan shall be reviewed and certified by an Engineer meeting the criteria of ASME Section VIII, Division 2 or 3, as applicable, for an Engineer signing and certifying a Manufacturer's Design Report. The review and certification shall be such as to ensure the work involved in the alteration is compatible with the user's design specification and the Manufacturer's Design Report.

5.13.1 FORM R-1, REPORT OF REPAIR

FORM R-1 REPORT OF REPAIR
in accordance with provisions of the *National Board Inspection Code*

1. Work performed by (1) (name of repair organization) (2) (Form Registration No.)
   (53) (PO No., Job No., etc.)
2. Owner (3) (name)
   (address)
3. Location of installation (4) (name)
   (address)
4. Item identification (5) (boiler, pressure vessel or piping) Name of original manufacturer (6)
5. Identifying nos.: (7) (mfg. serial no.) (8) (National Board No.) (8) (Jurisdiction No.) (8) (other) (9) (year built)
6. NBIC Edition/Addenda: (10) (edition) (10) (addenda)
   Original Code of Construction for Item: (11) (name/section/division) (11) (edition/addenda)
   Construction Code Used for Repair Performed: (11) (name/section/division) (11) (edition/addenda)
7. Repair Type: (55) ☐ Welded ☐ Graphite Pressure Equipment ☐ FRP Pressure Equipment
8. Description of work: (12) ☐ Form R-4, Report Supplementary Sheet is attached ☐ FFSA Form (NB-403) is attached
   (use Form R-4, if necessary)

   _____ Pressure Test, if applied (13) _____ psi MAWP (54) _____ psi
9. Replacement Parts. Attached are Manufacturer's Partial Data Reports or Form R-3s properly completed for the following items of this report:
   (14) (name of part, item number, data report type or Certificate of Compliance, mfg. name, and identifying stamp)
10. Remarks: (15)

Note to Editor: Add as part of line 7

☐ Gasketed Plate Heat Exchanger

SECTION 5

CERTIFICATE OF COMPLIANCE

I, (16), certify that to the best of my knowledge and belief the statements in this report are correct and that all material, construction, and workmanship on this Repair conforms to the *National Board Inspection Code*.
National Board "R" Certificate of Authorization No. (17) expires on (18), _____
Date (19), _____ (20) (name of repair organization) Signed (21) (authorized representative)

CERTIFICATE OF INSPECTION

I, (22), holding a valid Commission issued by The National Board of Boiler and Pressure Vessel Inspectors and certificate of competency, where required, issued by the Jurisdiction of (23)
and employed by (24) of (25)
have inspected the work described in this report on (26), _____ and state that to the best of my knowledge and belief this work complies with the applicable requirements of the *National Board Inspection Code*.
By signing this certicate, neither the undersigned nor my employer makes any warranty, expressed or implied, concerning the work described in this report. Furthermore, neither the undersigned nor my employer shall be liable in any manner for any personal injury, property damage or loss of any kind arising from or connected with this inspection.
Date (19), _____ Signed (27) (Inspector) Commissions (28) (National Board and Jurisdiction No.)

This form may be obtained from The National Board of Boiler and Pressure Vessel Inspectors, 1055 Crupper Ave., Columbus, OH 43229 NB-66 Rev. 12

5.13.4.1 INSTRUCTIONS FOR COMPLETING NATIONAL BOARD FORM "R" REPORTS A11

These instructions are to be used when completing the National Board Form "R" Reports. When computer generated, the format of the form shall replicate the type and relative location of the information depicted on the Form "R" Reports shown in NBIC Part 3, 5.13.1 through 5.13.4.

1. The name and address of the "R" Certificate Holder performing the work as it appears on the "Certificate of Authorization". On a Form R-2, the organization that performed the design work will complete sheet 1 of 2, and the organization completing the construction activities will complete sheet 2 of 2. A11

2. When registering a Form "R" Report with the National Board, this line is solely designated for a unique sequential number assigned by the "R" Certificate Holder. When the "R" Form is not to be registered, indicate so by "N/A". As described in NBIC Part 3,5.6, a log shall be maintained identifying sequentially, any Form "R" registered with the National Board. For re-rating only, the Design Organization registers the Form R-2. Where physical work is also performed, the Construction Organization registers the Form R-2. A11

3. Name and address of the Owner of the pressure-retaining item.

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

5. Description of the pressure-retaining item, such as boiler or pressure vessel, or piping. Include the applicable unit identification. A11

6. Name of the original manufacturer of the pressure-retaining item. If the original manufacturer is unknown, indicate by, "unknown". A11

7. Document the serial number of the pressure-retaining item if assigned by the original manufacturer. If there is no serial number assigned or is unknown, indicate "unknown". A11

8. When the pressure-retaining item is registered with the National Board, document the applicable registration number. If the pressure-retaining item is installed in Canada, indicate the Canadian design registration number (CRN), and list the drawing number under "other." If the item is not registered, indicate, "none". A11

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

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

11. Indicate the name, section, division, edition, and addenda of the original code of construction for the pressure-retaining item. Also indicate the name, section, division, edition, and addenda of the construction code used for the work being performed. If code cases are used, they shall be identified in the "Remarks" section.

12. Provide a summary describing the exact scope of work that was completed to a Pressure-Retaining Item (PRI). The information to be included when describing the scope of work shall consider items such as, the nature of the repair or alteration characterized by the listed examples, the specific location of the work performed to the PRI, the method of repair used to include as applicable, the steps taken to remove a defect or as allowed by NBIC Part 3, 3.3.4.8 to remain in place, the welding process and procedure when used, any special processes required such as PWHT, noting the soak time and temperatures recorded, and any acceptable in-process and final NDE-examinations or tests performed. When additional space is needed to fully describe the scope of work, a Form R-4 shall be used and attached.. A11

13. Indicate test pressure applied.

A11 14. As applicable, identify what parts manufactured by welding or bonding were introduced as needed to complete the scope of work. Indicate part, item number, manufacturer's name, stamped identification, and data report type or Certificate of Compliance.

15. Indicate any additional information pertaining to the work involved (e.g., routine repairs, code cases). For Form R-3, the part manufacturer is to indicate the extent he has performed any or all of the design function. If only a portion of the design, state which portion.

A11 16. Type or print name of authorized representative of the "R" Certificate Holder attesting to accuracy of the work described.

17. Indicate National Board "R" *Certificate or Authorization* number.

18. Indicate month, day, and year that the "R" certificate expires.

19. Enter date certified.

A11 20. Record name of "R" Certificate Holder who performed the described work, using full name as shown on the *Certificate of Authorization* or an abbreviation acceptable to the National Board.

21. Signature of authorized representative.

22. Type or print name of Inspector.

23. Indicate Inspector's Jurisdiction.

24. Indicate Inspector's employer.

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

26. Indicate month, day, and year of inspection by Inspector. In case of Routine Repairs this shall be the month, day, and year the Inspector reviews the completed Routine Repair package.

27. Signature of Inspector.

28. National Board commission number of Inspector, and when required by the Jurisdiction, the applicable State or Provincial numbers.

A11 29. Document name and address of organization that purchased the parts for incorporation into the repair or alteration. If the part's origin is unknown or the part was built for stock, so state.

A11 30. Document name of organization responsible for specifying the code design conditions, if known. If origin of design conditions are unknown, state "unknown".

A11 31. Document name of organization responsible for performing the code design, if known. If code design organization is unknown, state "unknown".

A11 32. Name, section, and division of the design code, if known. If the design is unknown, state "unknown"

33. Indicate code edition year used for fabrication.

34. Indicate code addenda date used for fabrication.

35. Indicate the code paragraph reference for formula used to establish the MAWP, if known. If the code reference of the formula is unknown, state "unknown". A11

36. If available, identify component by part's original name, function, or use the original equipment manufacturer's "mark or item number." A11

37. Indicate quantity of named parts.

38. Match line number references for identification of parts and description of parts.

39. Indicate manufacturer's serial number for the named part.

40. Indicate drawing number for the named part.

41. Indicate Maximum Allowable Working Pressure for the part, if known.

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

43. Indicate the complete material specification number and grade.

44. Indicate nominal thickness of plate and minimum thickness after forming.

45. Indicate shape as flat, dished, ellipsoidal, or hemispherical.

46. Indicate minimum thickness after forming.

47. Indicate outside diameter.

48. Indicate minimum thickness of tubes.

49. Complete information identical to that shown on the Form R to which this sheet is supplementary.

50. Indicate the Form R type. Example: Form R-1, Form R-2, Form R-3.

51. Indicate the reference line number from the Form R to which this sheet is supplementary.

52. Complete information for which there was insufficient space on the reference Form R.

53. If applicable, document the unique purchase order, job, or tracking number, assigned by organization performing work. A11

54. Indicate the maximum allowable working pressure of the pressure-retaining item.

55. Indicate the type of repair, e.g., welded, graphite pressure equipment, or fiber-reinforced plastic pressure equipment, or gasketed plate heat exchanger.

1.5 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 by, 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.

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], as defined in Part 3, Section 9, may audit the Quality System and activities of an organization upon a valid request from 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.~~

~~2 Jurisdiction: The National Board member jurisdiction where the organization is located. Alternatively, where the Jurisdiction elects not to 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.~~

~~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.

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**

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.

Item NB14-0301

3.3.3 EXAMPLE OF REPAIRS

u) The installation of a welded leak box.

3.3.9 ENCAPSULATION

Encapsulation is a repair method to restore the pressure retaining capability of an item by building a new pressure containing boundary over the item in the form of a welded leak box.

a) Welded Leak Box

1) Welded leak box design consists of a pressure retaining enclosure used to seal off leaking components or reinforce damaged or thinned components. The use of a leak box~~-~~ is subject to~~and may be used with~~ concurrence of the inspector and, when applicable, the jurisdiction.

a. A leak box can take a variety of shapes (e.g., cylindrical, rectangular, with either flat or formed heads), often following the contour of the component being encapsulated. Leak boxes may be fabricated by welding split pipe, pipe caps, or plates to encapsulate a pressure retaining item. Consideration should be given to add centering guides to aid with the installation. An example of a Welded Leak Box is shown in NBIC Part 3, Figure 3.3.9.

b. The annular space between the leak box and the component may be filled with an inert material (i.e., epoxy, sealant, fiber, refractory, etc.) which will support the effectiveness of the repair under pressure.

2) A welded leak box shall not be used to encapsulate a crack.

3) A Fitness for Service Assessment (FFSA) shall have been performed on the part being encapsulated in accordance with NBIC, Part 2, 4.4.1, supporting the continued service of the item. The leak box shall not remain in place beyond the calculated life of the pressure retaining item.

4) Design of the box and fabrication welds shall be in accordance with the original code of construction for the pressure retaining item being encapsulated, using original design conditions, taking into account current operating and shutdown conditions. Corrosion resistance, and mechanical properties of the leak box shall be taken into account.

a. The leak box design shall consider the potential introduction of new failure modes including that of the encapsulated component (i.e., encapsulated parts, expansion joints, pressure thrust, temperature differential, differential expansion, additional weight, sealant seepage, etc.).

5) The following are requirements for the leak box design;

a. The welded leak box assembly should be designed with vents and drains to permit venting the leak during assembly.

b. The leak box shall fully encapsulate the ~~thinned~~thinned or leaking area to a distance where sound metal is achieved.

1. The encapsulated component shall be ultrasonically scanned to ensure sufficient wall thickness at the weld locations.

c. When sealant is injected between the leak box and the component, consideration shall be given to off-gassing of sealant compounds as they cure.

~~5~~)6)The WPS followed shall be qualified in accordance with ASME Section IX. When the code of construction requires post weld heat treatment (PWHT) or the encapsulated component required PWHT, the WPS followed shall be qualified with PWHT. As an alternative and with concurrence of the inspector an alternate welding method may be used in accordance with NBIC Part 3, 2.5.3.

a. The nominal chemical composition of the deposited weld metal shall be compatible with the materials of construction. In addition, the nominal tensile strength of the deposited weld metal shall be equal to or exceed the encapsulated component's specified minimum tensile strength and shall be based on the requirements of the welding consumable.

b. When pressure retaining butt welds of the encapsulated component will be welded over, they shall be ground flush and volumetrically examined in accordance with the code of construction to ensure the existing weld is free from defects.

c. Longitudinal weld seams of the leak box components shall be staggered at a distance of at least five (5) times the thickness of the thicker component.

d. When welding to a component that is under pressure, the following shall be considered in developing the WPS: ppreheat temperature, the effect of process fluid flow on weld cooling rate, the effect of the weldinggg temperature on the strength of the metal under service conditions and the risk of burn through. When possible, consideration should be given to stopping leak to be encapsulated, prior to welding.

6)7)Welds shall be subjected to the nondestructive examination method used in the original code of construction or an alternative acceptable to the inspector. In addition, all full penetration longitudinal leak box welds shall be volumetrically examined and evaluated in accordance with the code of construction.

a. When pressure testing of the leak box is performed, the external pressure collapse of the encapsulated component during the test should be considered when determining the test pressure.

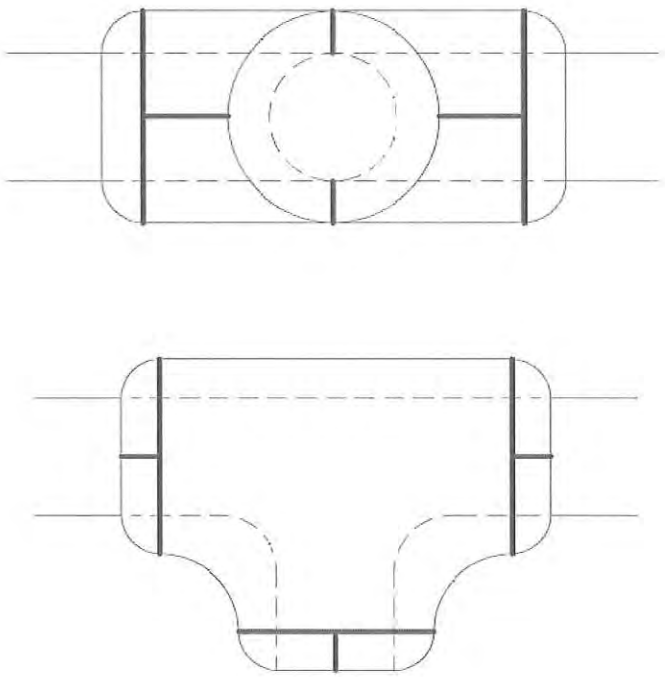
7)8)The "R" Stamp Holder performing the alterationrepair shall provide detailed information on the Form R-21, describing the extent of the alterationrepair and include the specific location the work was performed on the item. When a FFSA has been performed as described in NBIC, Part 2, 4.4.1, the remaining life of the item shall be documented on the Report of FFSA Form and in the Remarks section for the Form R-2. The Report of FFSA Form shall be affixed to the Form R-2.

a. The remaining life of the encapsulated pressure retaining item shall be documented on the Report of FFSA in the Remarks section. The Report of FFSA Form shall be affixed to the Form R-1.

DEFINITIONS

Encapsulation – to enclose, seal off or reinforce a component.

FIGURE 3.3.4
Welded Leak Box



NB 14-0302

5.13.1 FORM R-1, REPORT OF REPAIR

FORM R-1 REPORT OF REPAIR

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

1. Work performed by (1) _____ (2) _____ (Form Registration No.)
   (name of repair organization)
   _____ (53) _____ (PO No., Job No., etc.)
2. Owner (3) _____ (name)
   _____ (address)
3. Location of installation (4) Greville (name) USA, Canada, Mexico (address)
4. Item identification (5) _____ (boiler, pressure vessel or piping) Name of original manufacturer (6) _____
5. Identifying nos.: (7) _____ (mfg. serial no.) (8) _____ (National Board No.) (8) _____ (Jurisdiction No.) (8) _____ (other) (9) _____ (year built)
6. NBIC Edition/Addenda: (10) _____ (edition) (10) _____ (addenda)
   Original Code of Construction for Item: (11) _____ (name/section/division) (11) _____ (edition/addenda)
   Construction Code Used for Repair Performed: (11) _____ (name/section/division) (11) _____ (edition/addenda)
7. Repair Type: (55) ☐ Welded ☒ Graphite Pressure Equipment ☐ FRP Pressure Equipment
8. Description of work: (12) ☐ Form R-4, Report Supplementary Sheet is attached ☐ FFSA Form (NB-403) is attached
   (use Form R-4, if necessary)
   _____ Pressure Test, if applied (13) _____ psi MAWP (54) _____ psi
9. Replacement Parts. Attached are Manufacturer's Partial Data Reports or Form R-3s properly completed for the following items of this report:
   (14) _____ (name of part, item number, data report type or Certificate of Compliance, mfg. name, and identifying stamp)
10. Remarks: (15) _____

CERTIFICATE OF COMPLIANCE

I, (16) _____, certify that to the best of my knowledge and belief the statements in this report are correct and that all material, construction, and workmanship on this Repair conforms to the *National Board Inspection Code*. National Board "R" Certificate of Authorization No. (17) _____ expires on (18) _____, _____
Date (19) _____, _____ (20) _____ (name of repair organization) Signed (21) _____ (authorized representative)

CERTIFICATE OF INSPECTION

I, (22) _____, holding a valid Commission issued by The National Board of Boiler and Pressure Vessel Inspectors and certificate of competency, where required, issued by the Jurisdiction of (23) _____ and employed by (24) _____ of (25) _____ have inspected the work described in this report on (26) _____, _____ and state that to the best of my knowledge and belief this work complies with the applicable requirements of the *National Board Inspection Code*. By signing this certicate, neither the undersigned nor my employer makes any warranty, expressed or implied, concerning the work described in this report. Furthermore, neither the undersigned nor my employer shall be liable in any manner for any personal injury, property damage or loss of any kind arising from or connected with this inspection.
Date (19) _____, _____ Signed (27) _____ (inspector) Commissions (28) _____ (National Board and Jurisdiction No.)

This form may be obtained from The National Board of Boiler and Pressure Vessel Inspectors, 1055 Crupper Ave., Columbus, OH 43229 NB-66 Rev. 12

SECTION 5

A13 ~~5.13.2~~ FORM R-2, REPORT OF ALTERATION

Form R-2 Report of Alteration

in accordance with provisions of the National Board Inspection Code

(Form "R" Registration no.)

(P.O. No., Job No., etc.)

1a. Design performed by: _____
(name of "R" organization responsible for design)

(address)

1b. Construction performed by: _____
(name of "R" organization responsible for construction)

(address)

2. Owner of Pressure Retaining Item: _____
(name)

(address)

3. Location of Installation: Service _____
(name) (USA, Canada, Mexico, etc...)

(address)

4. Item identification: _____ Name of original manufacturer: _____
(boiler, pressure vessel, or piping)

5. Identifying nos: _____ _____ _____ _____ _____
(mfg. serial no.) (National Board No.) (Jurisdiction No.) (other) (year built)

6. NBIC Edition / ~~Addenda~~: _____ _____
(edition) (addenda)

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

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

7a. Description of Design Scope: _____

☐ Form R -4, Report Supplementary Sheet is attached

7b. Description of Construction Scope: _____

☐ Form R -4, Report Supplementary Sheet is attached

Pressure Test, if applied _____ psi MAWP _____ psi

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

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

FORM R-2 BACK

A13

9. Remarks: _____

DESIGN CERTIFICATION

I, _____, certify that to the best of my knowledge and belief the statements in this report are correct and that the Design Change described in this report conforms to the *National Board Inspection Code*.

National Board "R" Certificate of Authorization No. _____ expires on _____

Date _____ _____ Signed _____

(name of design organization) (authorized representative)

CERTIFICATE OF DESIGN CHANGE REVIEW

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

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

Date _____ Signed _____ Commissions _____

(inspector) (National Board and jurisdiction no.)

CONSTRUCTION CERTIFICATION

I, _____, certify that to the best of my knowledge and belief the statements in this report are correct and that all material, construction, and workmanship on this Alteration conforms to the National Board Inspection Code.

National Board "R" Certificate of Authorization No. _____ expires on _____

Date _____ _____ Signed _____

(name of alteration organization) (authorized representative)

CERTIFICATE OF INSPECTION

I, _____,holding a valid Commission issued by The National Board of Boiler and Pressure Vessel Inspectors and certificate of competency, where required, issued by the jurisdiction of _____ and employed by _____ of _____ have inspected the work described in this report on _____ and state that to the best of my knowledge and belief this work complies with the applicable requirements of the National Board Inspection Code.

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

Date _____ Signed _____ Commissions _____

(inspector) (National Board and jurisdiction no.)

5.13.3 FORM R-3, REPORT OF FABRICATED PARTS

FORM R-3 REPORT OF PARTS FABRICATED BY WELDING

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

1. Manufactured by (1) _____ (2) _____
   _____ (53) _____
2. Manufactured for (29) _____
   _____
3. Design Condition specified by (30) _____ Code design by (31) _____
4. Design Code (32) _____ (33) _____ (34) _____ (35) _____
5. Identification of Parts

Name of Part (36)	Qty. (37)	Line No. (38)	Manufacturer's Identifying No. (39)	Manufacturer's Drawing No. (40)	MAWP (41)	Shop Hydro PSI (13)	Year Built (9)

6. Description of Parts

	(a) Connections other than tubes			Heads or Ends			(b) Tubes		
Line No. (38)	Size and Shape (42)	Material Spec. No. (43)	Thickness (in.) (44)	Shape (45)	Thickness (in.) (46)	Material Spec. No. (43)	Diameter (in.) (47)	Thickness (in.) (48)	Material Spec. No. (43)

7. Remarks (15) _____

This form may be obtained from The National Board of Boiler and Pressure Vessel Inspectors, 1055 Crupper Ave., Columbus, OH 43229 NB-230 Rev. 2

Form R-3 (back)

(2) _____
(Form "R" No.)

CERTIFICATE OF COMPLIANCE

I, (16) _____, certify that to the best of my knowledge and belief the statements in this report are correct and that all material, fabrication, construction, and workmanship of the described parts conforms to the *National Board Inspection Code* and standards of construction cited.

National Board "R" Certificate of Authorization No. (17) _____ expires on (18) _____, _____

Date (19) _____, _____ (20) _____ Signed (21) _____
(name of "R" Certificate Holder) (authorized representative)

CERTIFICATE OF INSPECTION

I, (22) _____, holding a valid Commission issued by The National Board of Boiler and Pressure Vessel Inspectors and certificate of competency issued by the jurisdiction of (23) _____ and employed by (24) _____ of (25) _____ have inspected the parts described in this report on (26) _____, _____ and state that to the best of my knowledge and belief the parts comply with the applicable requirements of the *National Board Inspection Code*.

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

Date (26) _____, _____ Signed (27) _____ Commissions (28) _____
(inspector) (National Board and Jurisdiction No.)

~~5.13.4~~ FORM R-4, REPORT SUPPLEMENTARY SHEET

FORM R-4 REPORT SUPPLEMENTARY SHEET

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

1. Work performed by (1) (49) (name) — (2) (49) (Form "R" referenced)

(address) — (53) (49) (PO No., Job No., etc.)

2. Owner (3 or 29) (49) (name)

(address)

3. Location of installation (name)

(address)

Reference Line No. (51) — Continued from Form R– (50)

(52)

Date (19) , Signed (21) (authorized representative) Name (20) (49) (Name of "R" Certificate Holder)

Date (19) , Signed (27) (inspector) Commissions (28) (National Board and Jurisdiction No)

This form may be obtained from The National Board of Boiler and Pressure Vessel Inspectors, 1055 Crupper Ave., Columbus, OH 43229 NB-231 Rev. 2

5.13.4.1 INSTRUCTIONS FOR COMPLETING NATIONAL BOARD FORM "R" REPORTS

These instructions are to be used when completing the National Board Form "R" Reports. When computer generated, the format of the form shall replicate the type and relative location of the information depicted on the Form "R" Reports shown in NBIC Part 3, 5.13.1 through 5.13.4. [OR NEW S 6.19.4]

1. The name and address of the "R" Certificate Holder performing the work as it appears on the "Certificate of Authorization". On a Form R-2, the organization that performed the design work will complete line 1b) and the organization completing the construction activities will complete line 1a).

2. When registering a Form "R" Report with the National Board, this line is solely designated for a unique sequential number assigned by the "R" Certificate Holder. When the "R" Form is not to be registered, indicate so by "N/A". As described in NBIC Part 3, 5.6, a log shall be maintained identifying sequentially, any Form "R" registered with the National Board. For re-rating only, the Design Organization registers the Form R-2. Where physical work is also performed, the Construction Organization registers the Form R-2.

3. Name and address of the Owner of the pressure-retaining item.

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

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

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

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

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

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

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

11. Indicate the name, section, division, edition, and addenda of the original code of construction for the pressure-retaining item. Also indicate the name, section, division, edition, and addenda of the construction code used for the work being performed. If code cases are used, they shall be identified in the "Remarks" section.

12. Provide a detailed summary describing the scope of work that was completed to a Pressure Retaining Item (PRI). The information to be considered when describing the scope of work should include such items as, the nature of the repair or alteration (i.e. welding, bonding, cementing), the specific location of the work performed to the PRI, the steps taken to remove a defect or as allowed by 3.3.4.8 to remain in place, the method of repair or alteration described as listed in the examples of Part 3, Section 3 or supplemental section if applicable, and the acceptance testing and or examination method used in accordance with the NBIC. When additional space is needed to describe the scope of work, a Form R-4 shall be used and attached. Information determined to be of a proprietary nature need not be included , but shall be stated on the Form. A13

13. Indicate test pressure applied.

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

15. Indicate any additional information pertaining to the work involved (e.g., routine repairs, code cases). For Form R-3, the part manufacturer is to indicate the extent he has performed any or all of the design function. If only a portion of the design, state which portion.

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

17. Indicate National Board "R" Certificate or Authorization number.

18. Indicate month, day, and year that the "R" certificate expires.

19. Enter date certified.

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

21. Signature of authorized representative.

22. Type or print name of Inspector.

23. Indicate Inspector's Jurisdiction. (US or Canadian)

24. Indicate Inspector's employer.

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

26. Indicate month, day, and year of inspection by Inspector. In case of Routine Repairs this shall be the month, day, and year the Inspector reviews the completed Routine Repair package.

27. Signature of Inspector.

28. National Board commission number of Inspector, and when required by the Jurisdiction, the applicable State or Provincial numbers.
Registration

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

30. Document name of organization responsible for specifying the code design conditions, if known. If origin of design conditions are unknown, state "unknown".

31. Document name of organization responsible for performing the code design, if known. If code design organization is unknown, state "unknown".

32. Name, section, and division of the design code, if known. If the design is unknown, state "unknown"

33. Indicate code edition year used for fabrication.

34. Indicate code addenda date used for fabrication.

35. Indicate the code paragraph reference for formula used to establish the MAWP, if known. If the code reference of the formula is unknown, state "unknown".

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

37. Indicate quantity of named parts.

38. Match line number references for identification of parts and description of parts.

39. Indicate manufacturer's serial number for the named part.

40. Indicate drawing number for the named part.

41. Indicate Maximum Allowable Working Pressure for the part, if known.

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

43. Indicate the complete material specification number and grade.

44. Indicate nominal thickness of plate and minimum thickness after forming.

45. Indicate shape as flat, dished, ellipsoidal, or hemispherical.

46. Indicate minimum thickness after forming.

47. Indicate outside diameter.

48. Indicate minimum thickness of tubes.

49. Complete information identical to that shown on the Form R to which this sheet is supplementary.

50. Indicate the Form R type. Example: Form R-1, Form R-2, Form R-3.

51. Indicate the reference line number from the Form R to which this sheet is supplementary.

52. Complete information for which there was insufficient space on the reference Form R.

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

54. Indicate the maximum allowable working pressure of the pressure-retaining item.

55. Indicate the type of repair, e.g., welded, graphite pressure equipment, or fiber-reinforced plastic pressure equipment.

NB-14-0701

Attachment 2
In addition propose revised words in the code, additional a new second paragraph to be **added** to 3.2.2 c).

ASME stamping and completion of an ASME Manufacturer's Partial Data Report is not required for components 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.

	Comment	
Canonico	I disapprove of this action because I do not agree that R Stamp holders should be fabricating pressure parts. Pressure parts should be fabricated by an accredited ASME Stamp holder. Furthermore, this action is in direct conflict with what is currently in 3-3.2.2 (c).	This is why the change is being proposed. The intent is not to fabricate complete items, but only to fabricate assemblies that he would use in his repair or alteration.
Reetz	I reaffirm my disapproval of this action and for the same reasons given by myself earlier and by many others who have disappoved for the same reasons.	See response to Bob Reetz below
Riley	Reaffirm Disapproval after initial balloting. The proposed addition to 3.2.2c) to allow R-stamp part manufacture contradicts the first paragraph requireing ASME CoA and Partial Data Report. The reliance on 'controls described in the QC system' as a catch-all for replacement of stamping and data reports is too open ended.	See response to Dr Canonaco. Re: "controls" there are established criteria in ASME Code for similar actions.
Galanes	I disapprove of the proposed code change after giving this item considerable thought. ASME parts should be supplied by an ASME Certificate holder, and not an R-Certificate holder.	See response to Dr Canonico
Edwards	This revision would reverse a long-standing requirement of the NBIC which I believe needs further consideration prior to being adopted. Backgound on the code and/or industry changes warranting revision of our requirements for fabrication of ASME parts needs to be provided.	See response to Dr Canonico
Schulte	The verbiage proposed for section 3.2.2 provides additional clarification. The AI must accept these parts fabricated by the R Certificate holder, just as he as is	Thanks for your comment

	the case with any other parts or materials utilized.	
Richards	There should be either 1) a limit on a 'part' or 2) allowing the A/I to accept a 'part' for use based on a recognized industry standard/definition.	1) This sounds like a definition for part. See response to Mr Reetz 2) This is ok as long as it's covered in the QC Manual
Riley	Agree with comments from Mrs. Reetz, Webb, and Scribner. (1)The part wording may be similar to the following to address limitation of scope:'A part that is a portion, division, piece, or limited segment of the whole' may be fabricated by the R-Stamp holder (2) Agree with requiring the R-Stamp QC system to include description and controls (3) The R-1 should list the parts fabricated in the description or attach a description so they are clear for future inspectors (4) 3.2.2 should be changed to include the new allowance to make it clear.	
Reetz	My comment is that this new paragraph contradicts what presently is in 3.2.2. I do not approve of this change. If various small parts only are to be included I would not object. A definition of "parts" is clearly needed.	My opinion – defining parts will not only be difficult to do, it will cause more problems than it solves.

NB14-2401

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:

S6.5 Replacement Parts
d) When the original code of construction is other than ASME, replacement parts subject to internal or external pressure fabricated by welding shall be manufactured by an organization certified as required by the original code of construction. The item shall be inspected and stamped as required by the original code of construction. Certification to the original code of construction as required by the original code of construction or equivalent shall be supplied with the item. When this is not possible or practicable the organization fabricating the part may have a National Board *Certificate* of *Authorization.* Replacement parts shall be documented on Form TR-1 and the 'TR" Stamp applied as described in NBIC Part 3, S6.14.

b) Statement of Need

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

The need is to be consistent with NBIC part 3 for replacement parts fabricated by a TR stamp holder. The parts should be documented on a separate form similar to the one for an R stamp holder completes. The form referenced on the last line should be a TR-3 not 1.

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.

Throughout Supplement 6 the work that is done is documented on one form (TR-1). This can be a repair or alteration or modification. To develop a form to also address replacement parts is extremely difficult.

Paragraph S6.5 would be affected.

NB14-2402

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:

S6.3 ACCREDITATION
Organizations performing repairs, alterations, or modifications shall be accredited as in accordance with the National Board "TR" Program.

b) Statement of Need

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

The need is to discuss in text the accreditation process for a TR program in the supplement.

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.

S6.3 ACCREDITATION

Organizations performing repairs, alterations, or modifications shall be accredited as in accordance with **NBIC Part 3, Accreditation, Section 1; Major Section 1.5 and Section 1.5.1.** ~~the National Board "TR" Program.~~

NB15-0507

National Board of Boiler and Pressure Vessel Inspectors
National Board Inspection Code
Submission of Public Review Comment
2015 Draft Edition

PLEASE SUBMIT ONLY ONE COMMENT/RECOMMENDATION PER PAGE
Make additional copies as needed

Comments Must be Received No Later Than: October 13, 2014

Instructions: If unable to submit electronically, please print this form and fax or mail. Print or type clearly.

Date: October 1, 2014

Commenter Name: Nathan Carter

Commenter Address: HSB Global Standards, One State Street, PO Box 299
Hartford, CT 06141-0299

Commenter Phone: 860-722-5750

Commenter Fax: _____

Commenter Email: nathan_carter@hsbct.com

Section/Subsection Referenced: Part 3, 1.2 (f)

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

It is recognized that "DOT" is the US Department of Transportation. "DOT", however, is used throughout, but is not defined in Part 3. Since the NBIC is an International Standard, in my opinion this should be defined. As this section is the first occurrence of "DOT" in Part 3, this could be handled by the following change, which would also inherently limit the text to the DOT by the inclusion of "i.e.". Part 3, 1.2 (f):

"the Competent Authority, i.e. the US Department of Transportation (DOT), shall..."

Source: ☒ Own Experience/Idea ☐ Other Source/Article/Code/Standard

Submit Form To: Robin Hough, Secretary, NBIC Committee, The National Board of Boiler & Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, OH 43229, fax 614-847-1828, email, rhough@nationalboard.org

NB Use Only

Commenter No. Issued: PR15-01

Comment No. Issued: 04

Project Committee Referred To: SC Repairs and Alterations

NB15-0507; PR15-0104

NBIC Part 3 paragraph: 1.2 f)

f) For Transport Tanks, the Competent Authority, i.e. The US Department of Transportation (DOT), shall be consulted for any requirements which it has established since they take precedence for repairs,

National Board of Boiler and Pressure Vessel Inspectors
National Board Inspection Code
Submission of Public Review Comment
2015 Draft Edition

PLEASE SUBMIT ONLY ONE COMMENT/RECOMMENDATION PER PAGE
Make additional copies as needed

Comments Must be Received No Later Than: October 13, 2014

Instructions: If unable to submit electronically, please print this form and fax or mail. Print or type clearly.

Date: October 1, 2014

Commenter Name: Nathan Carter

Commenter Address: HSB Global Standards, One State Street, PO Box 299
Hartford, CT 06141-0299

Commenter Phone: 860-722-5750

Commenter Fax: _____

Commenter Email: nathan_carter@hsbct.com

Section/Subsection Referenced: Part 3, 1.8.7.2 n)2)f)

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

The personnel qualification programs and documents listed do not comply with 2013 Edition Section XI. Only CP-189 and the ACCP Certification program is listed in IWA-2310, with the exception of SNT-TC-1A, which is valid only until recertification is required, which is a 5 year recommended maximum per SNT-TC-1A 2006. As a result, I interpret IWA-2310 to mean SNT-TC-1A is being discontinued and is no longer valid for new Certifications. Also, the ASNT NDT Level II and III programs are not recognized as acceptable for stand alone use by any current ASME BPV Construction Code, but historically, it may have been. I am assuming that is what is inferred by the term "ASNT".

Source: ☒ Own Experience/Idea ☐ Other Source/Article/Code/Standard

Submit Form To: Robin Hough, Secretary, NBIC Committee, The National Board of Boiler & Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, OH 43229, fax 614-847-1828, email, rhough@nationalboard.org

NB Use Only

Commenter No. Issued: PR15-01

Comment No. Issued: 25

Project Committee Referred To: SC Repair and Alteration

NB15-1407; PR15-0126 Rev 0

NBIC Part 3

1.8.8.2 QUALITY PROGRAM ELEMENTS

j) Examinations, Tests and Inspections

A repair / replacement plan shall address all required information for performing examinations, tests and inspections including but not limited to:

- Establishing hold points
- Identifying procedures, methods, acceptance criteria
- Defects identified, removal methods, welding, brazing, fusing, and material requirements, reference points used for identification
- Evaluations of results

National Board of Boiler and Pressure Vessel Inspectors
National Board Inspection Code
Submission of Public Review Comment
2015 Draft Edition

PLEASE SUBMIT ONLY ONE COMMENT/RECOMMENDATION PER PAGE
Make additional copies as needed

Comments Must be Received No Later Than: October 13, 2014

Instructions: If unable to submit electronically, please print this form and fax or mail. Print or type clearly.

Date: October 1, 2014

Commenter Name: Nathan Carter

Commenter Address: HSB Global Standards, One State Street, PO Box 299
Hartford, CT 06141-0299

Commenter Phone: 860-722-5750

Commenter Fax:

Commenter Email: nathan_carter@hsbct.com

Section/Subsection Referenced: Part 3, 1.8.8.2 j)

Comment/Recommendation: *Proposed Solution:* ☐ New Text ☒ Revise Text ☐ Delete Text
In the third bullet, consider adding "brazing and fusing" in addition to welding.

Source: ☒ Own Experience/Idea ☐ Other Source/Article/Code/Standard

Submit Form To: Robin Hough, Secretary, NBIC Committee, The National Board of Boiler & Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, OH 43229, fax 614-847-1828, email, rhough@nationalboard.org

NB Use Only

Commenter No. Issued: PR15-01

Comment No. Issued: 26

Project Committee Referred To:
SC Repair and Alteration

NB15-1408; PR15-0127

NBIC Part 3 paragraph: 1.8.7.2 n) 2) f)

f) Nondestructive examination reports, including results of examinations, shall identify the ASNT, SNT-TC-1A, CP-189, or ACCP certification level of personnel interpreting the examination results. Final radiographs shall be included where radiography has been performed. Radiographs may be microfilmed or digitally reproduced in accordance with the requirements listed in ASME Section V, Article 2, Mandatory Appendix VI. The accuracy of the reproduction process shall be verified and monitored for legibility, storage, retrievability and reproduction quality;

NB15-0508

National Board of Boiler and Pressure Vessel Inspectors
National Board Inspection Code
Submission of Public Review Comment
2015 Draft Edition

PLEASE SUBMIT ONLY ONE COMMENT/RECOMMENDATION PER PAGE
Make additional copies as needed

Comments Must be Received No Later Than: October 13, 2014

Instructions: If unable to submit electronically, please print this form and fax or mail. Print or type clearly.

Date: October 1, 2014

Commenter Name: Nathan Carter

Commenter Address: HSB Global Standards, One State Street, PO Box 299
Hartford, CT 06141-0299

Commenter Phone: 860-722-5750

Commenter Fax: _____

Commenter Email: nathan_carter@hsbct.com

Section/Subsection Referenced: Part 3, 1.8.7.2 n)2)f) another

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

Fourth line down. "Radiographs may be microfilmed or digitally reproduced". Consider making the following addition at the end of the sentence, "in accordance with the requirements listed in the latest Edition of ASME Section V, Article 2, Mandatory Appendix VI." This Mandatory Appendix is titled, "MANDATORY APPENDIX VI DIGITAL IMAGE ACQUISITION, DISPLAY, INTERPRETATION, AND STORAGE OF RADIOGRAPHS FOR NUCLEAR APPLICATIONS." It provides rules for the proper considerations in digitizing analog radiographs and storage requirements, etc.

Source: ☒ Own Experience/Idea ☐ Other Source/Article/Code/Standard _____

Submit Form To: Robin Hough, Secretary, NBIC Committee, The National Board of Boiler & Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, OH 43229, fax 614-847-1828, email, rhough@nationalboard.org

NB Use Only

Commenter No. Issued: PR15-01

Comment No. Issued: 27

Project Committee Referred To: SC Repair and Alteration

NB15-1409; PR15-0130

NBIC Part 3 paragraph: 1.8.7.2 g)

~~When the Owner performs repair/replacement activities, p~~Purchase of materials and small products shall meet the requirements specified in ASME Section XI, IWA 4142. Measures shall be established to ensure that purchased material, items, and services conform to the Owner's requirements and applicable edition and addenda of the Code of Construction and ASME Section XI. These measures shall include identification for material traceability. Provisions shall be identified for source evaluation and objective evidence shall be provided evidencing quality standards for material examination upon receipt.

NB15-0508

National Board of Boiler and Pressure Vessel Inspectors
National Board Inspection Code
Submission of Public Review Comment
2015 Draft Edition

PLEASE SUBMIT ONLY ONE COMMENT/RECOMMENDATION PER PAGE
Make additional copies as needed

Comments Must be Received No Later Than: October 13, 2014

Instructions: If unable to submit electronically, please print this form and fax or mail. Print or type clearly.

Date: October 1, 2014

Commenter Name: Nathan Carter

Commenter Address: HSB Global Standards, One State Street, PO Box 299
Hartford, CT 06141-0299

Commenter Phone: 860-722-5750

Commenter Fax: _____

Commenter Email: nathan_carter@hsbct.com

Section/Subsection Referenced: Part 3, 1.8.7.2 g)

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

This section does not address the situation when the Owner subcontracts the repair/replacement for Category 2, only when the Owner performs the repair/replacement activities.

Source: ☒ Own Experience/Idea ☐ Other Source/Article/Code/Standard _____

Submit Form To: Robin Hough, Secretary, NBIC Committee, The National Board of Boiler & Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, OH 43229, fax 614-847-1828, email, rhough@nationalboard.org

NB Use Only

Commenter No. Issued: PR15-01

Comment No. Issued: 30

Project Committee Referred To: SC Repair and Alteration

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).

NB15-0509

National Board of Boiler and Pressure Vessel Inspectors
National Board Inspection Code
Submission of Public Review Comment
2015 Draft Edition

PLEASE SUBMIT ONLY ONE COMMENT/RECOMMENDATION PER PAGE
Make additional copies as needed

Comments Must be Received No Later Than: October 13, 2014

Instructions: If unable to submit electronically, please print this form and fax or mail. Print or type clearly.

Date: October 7, 2014

Commenter Name: Nathan Carter

Commenter Address: HSB Global Standards, One State Street, PO Box 299
Hartford, CT 06141-0299

Commenter Phone: 860-722-5750

Commenter Fax: _____

Commenter Email: nathan_carter@hsbct.com

Section/Subsection Referenced: Part 3, 2.5.3.6 5) d)

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

Filler Metal 82, Inconel Welding Electrode 182, and INCO-WELD A are all Brand names for ~~consumables sold by Special Metals. EPRI P87 is a Brand name, I believe licensed~~ to be sold by Metrode at least. Why are the consumable classifications and Code Cases by themselves not sufficient. Without an "e.g." in the parenthesis after each classification, it can be read that these Brand names are required, which would restrict trade by not allowing other manufacturers from supplying consumables to those ~~classifications and Code Cases.~~

Source: ☒ Own Experience/Idea ☐ Other Source/Article/Code/Standard

Submit Form To: Robin Hough, Secretary, NBIC Committee, The National Board of Boiler & Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, OH 43229, fax 614-847-1828, email, rhough@nationalboard.org

NB Use Only

Commenter No. Issued: PR15-01

Comment No. Issued: 56

Project Committee Referred To:
SC Repair and Alteration

NB15-0509

National Board of Boiler and Pressure Vessel Inspectors
National Board Inspection Code
Submission of Public Review Comment
2015 Draft Edition

PLEASE SUBMIT ONLY ONE COMMENT/RECOMMENDATION PER PAGE
Make additional copies as needed

Comments Must be Received No Later Than: October 13, 2014

Instructions: If unable to submit electronically, please print this form and fax or mail. Print or type clearly.

Date: 10/13/14

Commenter Name: Mark R. Kincs

Commenter Address: Xcel Energy Services Inc.
1518 Chestnut Ave., Minneapolis, MN 55403

Commenter Phone: (612) 630-4152

Commenter Fax: (612) 630-4367

Commenter Email: mark.r.kincs@xcelenergy.com

Section/Subsection Referenced: Part 3 - Section 2.5.3.6 d)
Comment/Recommendation: *Proposed Solution:* ☐ New Text ☒ Revise Text ☐ Delete Text

The proposed language references Code Case filler metals acceptable for consideration as F-No. 43 for welding performance qualifications only (ref. Code Cases 2733 & 2734). Also, the accepted F-No. 43 materials, as presented, allow supply by a single manufacturer only. The following alternative language is proposed.

"Filler metals shall be austenitic, nickel-based consumables limited to ASME Code Case 2733, Code Case 2734, or one of the following F-No. 43 materials listed in ASME Section IX: ERNiCr-3, ENiCrFe-2, or ENiCrFe-3."

Source: ☒ Own Experience/Idea ☒ Other Source/Article/Code/Standard ASME Sect. IX & CC 2733, 2734

Submit Form To: Robin Hough, Secretary, NBIC Committee, The National Board of Boiler & Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, OH 43229, fax 614-847-1828, email, rhough@nationalboard.org

NB Use Only
Commenter No. Issued: PR15-05
Comment No. Issued: 01
Project Committee Referred To: SC Repair and Alteration

NB15-1402
NB15-0509

National Board of Boiler and Pressure Vessel Inspectors
National Board Inspection Code
Submission of Public Review Comment
2015 Draft Edition

PLEASE SUBMIT ONLY ONE COMMENT/RECOMMENDATION PER PAGE
Make additional copies as needed

Comments Must be Received No Later Than: October 13, 2014

Instructions: If unable to submit electronically, please print this form and fax or mail. Print or type clearly.

Date: October 7, 2014

Commenter Name: Nathan Carter

Commenter Address: HSB Global Standards, One State Street, PO Box 299
Hartford, CT 06141-0299

Commenter Phone: 860-722-5750

Commenter Fax: _____

Commenter Email: nathan_carter@hsbct.com

Section/Subsection Referenced: Part 3, 2.5.3.6 c) another

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

Quantify humid environment. Humid is a relative term. What is Humid to an R-Certificate ~~Holder in North Dakota may not be to an R Certificate Holder in southern Georgia.~~ I understand the intent here, but really the R-Certificate holder needs to understand Relative Humidity vs. Dewpoint and the concern for Condensate forming on the post repaired "cold" tubes. Also, the repair may occur during the day when the humidity is acceptable, but during the night (potentially when the repair location is not being ~~manned), the temperature may approach the dewpoint resulting in condensation,~~ which may evaporate off of the tubes before the day shift resumes and nobody knows of the moisture contamination. If you state in the code that a Moisture Barrier Coating is required to be applied after the repair, this concern is mitigated.

Source: ☒ Own Experience/Idea ☐ Other Source/Article/Code/Standard

Submit Form To: Robin Hough, Secretary, NBIC Committee, The National Board of Boiler & Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, OH 43229, fax 614-847-1828, email, rhough@nationalboard.org

NB Use Only

Commenter No. Issued: PR15-01

Comment No. Issued: 57

Project Committee Referred To: SC Repair and Alteration

NB15-0509

National Board of Boiler and Pressure Vessel Inspectors
National Board Inspection Code
Submission of Public Review Comment
2015 Draft Edition

PLEASE SUBMIT ONLY ONE COMMENT/RECOMMENDATION PER PAGE
Make additional copies as needed

Comments Must be Received No Later Than: October 13, 2014

Instructions: If unable to submit electronically, please print this form and fax or mail. Print or type clearly.

Date: October 7, 2014

Commenter Name: Nathan Carter

Commenter Address: HSB Global Standards, One State Street, PO Box 299
Hartford, CT 06141-0299

Commenter Phone: 860-722-5750

Commenter Fax: _____

Commenter Email: nathan_carter@hsbct.com

Section/Subsection Referenced: Part 3, 2.5.3.6 c)

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

After the weld repair is completed and the R-1 signed, how is the requirement that the ~~repair region be kept from humid or moist environments to be verified, if for instance~~ there is a delay in the return to service after this specific repair? During consideration of this item, presentations discussed the use of Moisture Barrier Coatings as being adequate to protect the repair region. If this is an adequate solution, which reduces risk, why not list the use of a moisture barrier coating is recommended at the ~~very least, if not requiring its use?~~

Source: ☒ Own Experience/Idea ☐ Other Source/Article/Code/Standard

Submit Form To: Robin Hough, Secretary, NBIC Committee, The National Board of Boiler & Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, OH 43229, fax 614-847-1828, email, rhough@nationalboard.org

NB Use Only

Commenter No. Issued: PR15-01

Comment No. Issued: 58

Project Committee Referred To: SC Repair and Alteration

NB15-0510

National Board of Boiler and Pressure Vessel Inspectors
National Board Inspection Code
Submission of Public Review Comment
2015 Draft Edition

PLEASE SUBMIT ONLY ONE COMMENT/RECOMMENDATION PER PAGE
Make additional copies as needed

Comments Must be Received No Later Than: October 13, 2014

Instructions: If unable to submit electronically, please print this form and fax or mail. Print or type clearly.

Date: October 1, 2014

Commenter Name: Nathan Carter

Commenter Address: HSB Global Standards, One State Street, PO Box 299
Hartford, CT 06141-0299

Commenter Phone: 860-722-5750

Commenter Fax: _____

Commenter Email: nathan_carter@hsbct.com

Section/Subsection Referenced: Part 3, 3.3.4.9 b)

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

What about for a brazed boiler, should tube plugging by brazing be considered for inclusion? I have no knowledge of its use.

Source: ☒ Own Experience/Idea ☐ Other Source/Article/Code/Standard _____

Submit Form To: Robin Hough, Secretary, NBIC Committee, The National Board of Boiler & Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, OH 43229, fax 614-847-1828, email, rhough@nationalboard.org

NB Use Only

Commenter No. Issued: PR15-01

Comment No. Issued: 19

Project Committee Referred To: SC Repair and Alteration

NB15-0511

National Board of Boiler and Pressure Vessel Inspectors
National Board Inspection Code
Submission of Public Review Comment
2015 Draft Edition

PLEASE SUBMIT ONLY ONE COMMENT/RECOMMENDATION PER PAGE
Make additional copies as needed

Comments Must be Received No Later Than: October 13, 2014

Instructions: If unable to submit electronically, please print this form and fax or mail. Print or type clearly.

Date: October 1, 2014

Commenter Name: Nathan Carter

Commenter Address: HSB Global Standards, One State Street, PO Box 299
Hartford, CT 06141-0299

Commenter Phone: 860-722-5750

Commenter Fax: _____

Commenter Email: nathan_carter@hsbct.com

Section/Subsection Referenced: Part 3, 5.13.5.1 31.

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

What about Category 3 repairs/alterations, etc? What if it was performed to an International Code other than Section III or XI? Per the instruction, there isn't a way to address this situation.

Also, Hyphenate "rerating" to "re-rating" to be consistent with the NBIC.

Source: ☒ Own Experience/Idea ☐ Other Source/Article/Code/Standard

Submit Form To: Robin Hough, Secretary, NBIC Committee, The National Board of Boiler & Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, OH 43229, fax 614-847-1828, email, rhough@nationalboard.org

NB Use Only

Commenter No. Issued: PR15-01

Comment No. Issued: 20

Project Committee Referred To: SC Repair and Alteration

NB15-0512

National Board of Boiler and Pressure Vessel Inspectors
National Board Inspection Code
Submission of Public Review Comment
2015 Draft Edition

PLEASE SUBMIT ONLY ONE COMMENT/RECOMMENDATION PER PAGE
Make additional copies as needed

Comments Must be Received No Later Than: October 13, 2014

Instructions: If unable to submit electronically, please print this form and fax or mail. Print or type clearly.

Date: October 1, 2014

Commenter Name: Nathan Carter

Commenter Address: HSB Global Standards, One State Street, PO Box 299
Hartford, CT 06141-0299

Commenter Phone: 860-722-5750

Commenter Fax: _____

Commenter Email: nathan_carter@hsbct.com

Section/Subsection Referenced: Part 3, S3.5.5 b)

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

My comment refers to Section VIII, Division 1, Part UGI-79 and UGI-80 referenced on the last line. After reading these paragraphs in whole, I ~~do not understand why only some of the subsections are listed and not~~ the whole of UGI-79 and UGI-80. In my opinion, all of UGI-79 and UGI-80 should be included.

Source: ☒ Own Experience/Idea ☐ Other Source/Article/Code/Standard

Submit Form To: Robin Hough, Secretary, NBIC Committee, The National Board of Boiler & Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, OH 43229, fax 614-847-1828, email, rhough@nationalboard.org

NB Use Only

Commenter No. Issued: PR15-01

Comment No. Issued: 21

Project Committee Referred To:
SC Repair and Alteration

NB15-0513

National Board of Boiler and Pressure Vessel Inspectors
National Board Inspection Code
Submission of Public Review Comment
2015 Draft Edition

PLEASE SUBMIT ONLY ONE COMMENT/RECOMMENDATION PER PAGE
Make additional copies as needed

Comments Must be Received No Later Than: October 13, 2014

Instructions: If unable to submit electronically, please print this form and fax or mail. Print or type clearly.

Date: October 1, 2014

Commenter Name: Nathan Carter

Commenter Address: HSB Global Standards, One State Street, PO Box 299
Hartford, CT 06141-0299

Commenter Phone: 860-722-5750

Commenter Fax: _____

Commenter Email: nathan_carter@hsbct.com

Section/Subsection Referenced: Part 3, S6.14.1

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

Fifth line down. "Registered Inspector" is used but is not defined in Part 3. Use of the term "Inspector" and "Registered Inspector" is also ~~used interchangeably in the current published text not under review.~~ Consistency is needed in this Supplement.

Source: ☒ Own Experience/Idea ☐ Other Source/Article/Code/Standard _____

Submit Form To: Robin Hough, Secretary, NBIC Committee, The National Board of Boiler & Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, OH 43229, fax 614-847-1828, email, rhough@nationalboard.org

NB Use Only

Commenter No. Issued: PR15-01

Comment No. Issued: 36

Project Committee Referred To: SC Repair and Alteration

NB15-~~1410 0513;~~ PR15-0122

NBIC Part 3 paragraph: S6.14.1 f)

f) The non-embossed Code Symbol stamping, when directly applied on the item or when a nameplate is used shall be applied adjacent to the original manufacturer's stamping or nameplate. A single repair~~, alteration, or modification~~ stamping or nameplate may be used for more than one repair to a Transport Tank, provided the repair~~, alteration, or modification~~ activity is carried out by the same certificate holder;

NB15-0513

National Board of Boiler and Pressure Vessel Inspectors
National Board Inspection Code
Submission of Public Review Comment
2015 Draft Edition

PLEASE SUBMIT ONLY ONE COMMENT/RECOMMENDATION PER PAGE
Make additional copies as needed

Comments Must be Received No Later Than: October 13, 2014

Instructions: If unable to submit electronically, please print this form and fax or mail. Print or type clearly.

Date: October 1, 2014

Commenter Name: Nathan Carter

Commenter Address: HSB Global Standards, One State Street, PO Box 299
Hartford, CT 06141-0299

Commenter Phone: 860-722-5750

Commenter Fax: _____

Commenter Email: nathan_carter@hsbct.com

Section/Subsection Referenced: Part 3, S6.14.1 f)

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

I understand the intent for numerous repairs throughout the life of a Transport Tank using one nameplate under the conditions listed. Do you ~~really mean for infinite "alterations and modifications" to be allowed~~ under a single nameplate/stamping? Please reconsider this.

Source: ☒ Own Experience/Idea ☐ Other Source/Article/Code/Standard

Submit Form To: Robin Hough, Secretary, NBIC Committee, The National Board of Boiler & Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, OH 43229, fax 614-847-1828, email, rhough@nationalboard.org

NB Use Only

Commenter No. Issued: PR15-01

Comment No. Issued: 22

Project Committee Referred To: SC Repair and Alteration

NBIC Committee
Action Block

Subject	**Revision to Routine Repairs**		
File Number	NB14-0702	**Prop. on Pg.**	
Proposal	Part 3: Paragraph 3.2 e): Correct to limit the categories of routine repairs.		
Explanation	The lead-in sentence for routine repairs contains a clause that could be mis-read to mean that the four categories of routine repairs that are listed are only suggested rather than an all inclusive list of those repairs that are approved. The first sentence reads "Repairs falling within one or more of the following categories may be considered routine." The word "may" has many times caused concern and debate amongst R stamp holders, Owners, and Inspectors. Some that believe that since it says "may" that other repairs not falling into one of the four categories listed could be a routine repair. This is clearly not the case, nor is it the intention the NBIC. This provision has been in the NBIC for a long time. This proposal is to correct the reading in the first sentence to make it clear that routine repairs are limited to only those categories listed in the subparagraphs that follow. This was confirmed in interpretation NB 04-09: **INTERPRETATION 04-09** Subject: Part RC-2031, Flush Routine Repairs 2004 Edition with 2004 Addenda Question: May repairs that are not included in RC-2031(a) be performed and documented as routine repairs? Reply: No.		
Project Manager	Robert Wielgoszinski		
Task Group Negatives		**TG Meeting Date**	

Revision to Part 3 para 3.3.2(e)

The following repairs may be considered as routine repairs and shall be limited to these categories.

e) ~~Repairs falling within one or more of the following categories may be considered routine:~~

1) Welded repairs or replacements of valves, fittings, tubes, or pipes NPS 5 (DN 125) in diameter and smaller, or sections thereof, where neither postweld heat treatment nor NDE other than visual is required by the original code of construction. This includes their attachments such as clips, lugs, skirts, etc., but does not include nozzles to pressure-retaining items;

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

3) Weld buildup of wasted areas in heads, shells, flanges and fittings not exceeding an area of 100 sq. inches (64,520 sq. mm) or a thickness of 25% of nominal wall thickness or ½ inch (13 mm), whichever is less; A13

4) Corrosion resistance weld overlay not exceeding 100 sq. in. (64,520 sq. mm).

3.3.3 EXAMPLES OF REPAIRS

a) Weld repairs or replacement of pressure parts or attachments that have failed in a weld or in the base material;

b) The addition of welded attachments to pressure parts, such as:

1) Studs for insulation or refractory lining;

2) Hex steel or expanded metal for refractory lining;

3) Ladder clips;

4) Brackets having loadings that do not affect the design of the pressure-retaining item to which they are attached; and

5) Tray support rings.

c) Corrosion resistant strip lining, or weld overlay;

d) Weld buildup of wasted areas;

e) Replacement of heat exchanger tubesheets in accordance with the original design;

f) Replacement of boiler and heat exchanger tubes where welding is involved;

g) In a boiler, a change in the arrangement of tubes in furnace walls, economizers, or super heater sections;

h) Replacement of pressure-retaining parts identical to those existing on the pressure-retaining item and described on the original *Manufacturer's Data Report*. For example:

1) Replacement of furnace floor tubes and/or sidewall tubes in a boiler;

2) Replacement of a shell or head in accordance with the original design;

INTERPRETATION 04-09

Subject: Part RC-2031, Flush Routine Repairs
2004 Edition with 2004 Addenda

Question: May repairs that are not included in RC-2031(a) be performed and documented as routine repairs?
Reply: No.

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:

NBIC 2013, Part 3

3.3.4.3 WASTED AREAS

d) Tubes
1) Wasted areas on tubes may be repaired by welding, provided that, in the judgment of the Inspector the strength of the tube has not been impaired. Where deemed necessary, competent technical advice should be obtained from the manufacturer or from another qualified source. This may be necessary when considering such items as size limitations of repaired areas, minimum tube thickness to be repaired, tube environment, location of the tube in the boiler, and other similar conditions.

2) The WPS followed shall be qualified for weld metal buildup in accordance with ASME Section IX. When the code of construction required postweld heat treatment (PWHT) for butt welds, the WPS followed for the weld buildup, shall be qualified with PWHT.

b) Statement of Need

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

This Item opened to address a minimum wall thickness of base metal and welding processes prior to commencing build-up of wasted areas.
Reference National Boiler Service, Inc. report presented to Black Liquor Recovery Boiler Advisory Committee during October 2013 meeting.

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.

See attached report. (8 Pages)

From: Parrish, David [mailto:david.parrish@fmglobal.com]
Sent: Thursday, September 25, 2014 11:10 AM
To: George Galanes; jpillow@commonarc.com
Cc: bvallance@nationalboard.org; Martinez, David; Barker, Timothy
Subject: Weld Buildup Wasted Areas - Tubes

Thought your committee members might find attached interesting. It is extracted from the BLRBAC October 2013 meeting minutes (posted on the www.blrbac.org website). Wasted areas of tubes are frequently repaired by "pad" welding – even for leaks. A few operators do not permit pad weld repair if failure could admit water to furnace (smelt-water explosion potential). Some operators replace tube section at next maintenance outage. For remainder, the pad weld becomes a long-term solution that may again leak.

It might be helpful for this industry if a "Welding Method" could be developed for inclusion in Part 3.

Best Regards,

Dave P
Senior Staff Engineering Specialist
FM Global - Engineering Standards, Equipment Hazards
781-255-4734

NATIONAL BOILER SERVICE, INC.

Weld Build Up Research

This report contains the results of *Weld Build Ups* that were performed on the outside diameter of boiler tubes (approx.180 thick) that were turned down (milled) on a lathe to a thickness of .120", .100", .090", .080", .070" thick to simulate boiler tube thinning for this research.

Weld Build Up of Wasted Area is the correct term for this type of repair in the Boiler and Pressure Vessel industry. Other jargon or terms used to describe this type of repair are Pad Welding (which is most frequently used) and Weld Overlay.

The objective of this research is to identify and/or determine what the welding process is doing to the inside of the tubes after weld build up was performed and at what wall thicknesses the tubes were adversely affected.

The Following Welding Processes were used:

- GTAW (TIG) - 3/32" Filler Metal
- SMAW (Stick) - 3/32" Filler Metal
- GMAW (MIG) (Hard Wire) - .035" Bare Wire Filler Metal

Note: The tubes must be cleaned thoroughly before welding.

The Tube positions when the weld build up was performed was about 45° and Vertical positions to simulate different configurations in a boiler such as vertical (Water-wall Tubes), Flat (Floor or Roof Tubes) and approximately 45° (Arch or Sloped Floor Tubes etc.).

The following photos are of weld build up that were performed on tube specimens that were cut in half to view and inspect the inside of the tubes. A description of our findings is under each photo.

Welding Terms:

- Burn-thru – A hole is burned through the base metal.
- Melt-thru – The welding filler metal is melted through to the inside of the base metal (push-thru).
- Sugaring - Oxidation of the weld or base metal.

Base Metal Designations and Terms:

* P1 - Carbon Steel Tubes ,"SA 178, 210 etc."
* P3 - Carbon/Moly Steel Tubes, "SA 209 T1"
* P4 - 1.25% Chrom, Alloy Steel Tubes, "SA 213 T11"
* P5 - 2.25% Chrom, Alloy Steel Tubes , "SA 213 T22
* P8 – Stainless Steel Tubes, "SA 213 TP 304,308,316 etc."

Conclusion

From this research, It is our opinion, the GTAW (TIG) process, is not recommended to perform Weld Build Up on P1, P3, P4 or P5 base metals that are below .100" thick. Burn-thru and melt-thru is virtually inevitable.

The GMAW (MIG) process (downhill progression with .035 Wire Size) can be used to Perform Weld Build Up on Tubes as thin as .080" thick, with minimal melt-thru or burn thru.

For stainless base metals (P8), it is not good practice or recommended to perform Weld Build Up on base metals that are below .120" thick. Extreme oxidization (Sugaring) virtually cannot be avoided on the Inside diameter of the tube where no backing or shielding gas is utilized.

Steve Harville
Corporate Quality Control Manager

176 North Industrial Blvd. PO Box 279, Trenton, GA 30752 P:(706) 657-6200 F: (706) 657-4875
www.nationalboiler.com

OD: Carbon Steel (P1) ***SMAW (Stick) process with E 7018 - 3/32"*** was used on these samples. The Weld Progression was Uphill. On all 4 of these samples the Welder Burned-thru the base metal, as the samples got thinner, the Burn-thru was more frequent.

ID: Carbon Steel (P1) The Burn-thru that you see here is not "Melt-thru" it is "Burn-thru." Holes were actually burned in the base metal and filled back up with the SMAW process as the Welder was welding. Note: .070" sample was too thin to Weld.

OD: Carbon Steel (P1), ***GTAW (TIG) process with E 70 S2 - 3/32"*** was used on these samples. The Weld Progression was Uphill. On all 4 of these samples the Welder Melted-thru the base metal, as the samples got thinner, the Melt-thru was more frequent and excessive.

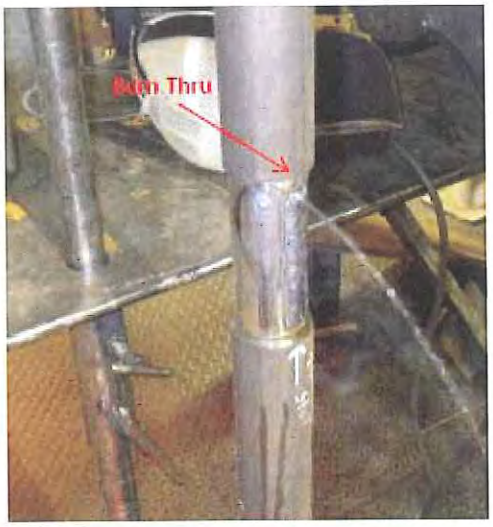
ID: The Melt-thru here is very excessive on the .090", .080" and .070" Samples

OD: Carbon Steel (P1), ***GMAW (MIG) process with E 70 S2 - .035"*** Wire was used on these samples. The Weld Progression was Downhill. Uphill is **not** recommended. On all of these samples the Welder had very minimal Melt-thru on all thicknesses of the base metal. The GMAW Process requires the base metal to be very clean. When applying Weld Build Up on Tubes of approximatly .120" and below, **GMAW (MIG) is the preferred method for Weld Build UP.**

ID: Notice the Melt-thru on the Tube ID is very minimal.

OD: Stainless: *GTAW (TIG) process with E 316L* - 3/32" was used on these samples. The Weld Progression was Uphill. On all 3 of these samples the Welder Melted-thru the base metal, as the samples got thinner, the Melt-thru was more frequent and excessive.

ID: Stainless: The Melt-thru on the .100" & .080" thick samples was excessive and "Sugared" (oxidized) the ID of the Tube. This is because the ID of the Tube is not accessible to use a Backing Gas such as Argon to shield the base metal or weld area.



OD: 1-1/4 Chrome (P4), SA 213 T11: *Superheat Tube Simulation* (with Water in the Tube). ***GTAW (TIG) process with ER 80S B3-*** 3/32" was used. The Weld Progression was Uphill. Welder Burned-thru the base metal once on the .090" sample and multiple times on the .070" sample.

ID: 1-1/4 Chrome (P4), SA 213 T11 *Superheat Tube Simulation* (with Water in the Tube). With water in the Tube, there is little to no indication it is about to burn though the base metal. With the .070" Tube we had to let it cool 3 to 5 minutes between weld passes or between half a weld pass.

EPRI | ELECTRIC POWER RESEARCH INSTITUTE

Weld Repair of Grade 91 Piping and Components Phase 3 Technology Transfer

Best Practice Guideline for Well-Engineered Weld Repair of Grade 91 Steel (3002003383)

John A. Siefert and Jonathan D. Parker
Program 87 Fossil Materials and Repair

National Board Inspection Code Part 3
January 20th, 2015

Program 87 Technology Transfer Week
Location: Brown Hotel, Denver, CO

Date	Subject	Who can attend
Jun 22 Jun 23 (8am-noon)	Weld Repair of Grade 91 Piping and Components – Technology Transfer (SPN 3002001569)	Supplemental Project Funders Only
Jun 23 (1pm-5pm)	**New Supplemental Program Launch:** *Application of Well-Engineered Weld Repairs for Grade 91 and other Creep Strength-Enhanced Ferritic (CSEF) Steels* (SPN 3002004332)	Open to Industry for Comment (future meetings for funders only)
Jun 23	Industry Reception	Open to industry
Jun 24	CSEF Interest Group Topic: Life Management of Gr. 91 Steel	Open to industry
Jun 25 Jun 26 (8am-noon)	EPRI Fossil Materials & Repair (P87) Technology Transfer	Program 87 Funders Only

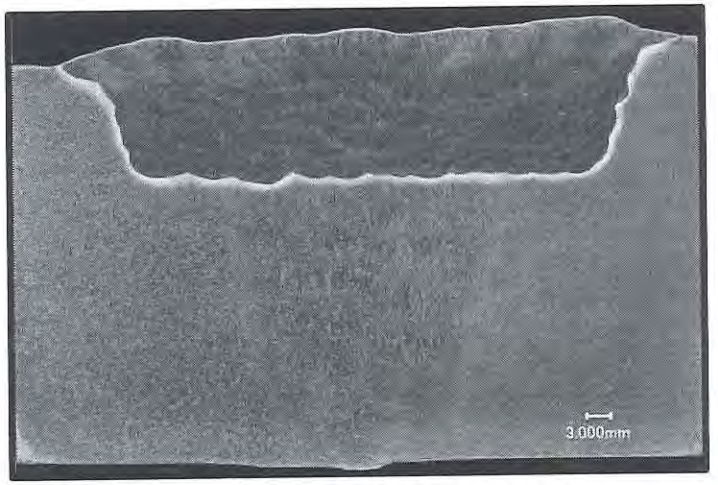
More details on P87 cockpit and EPRI calendar of events

EPRI | ELECTRIC POWER RESEARCH INSTITUTE

Application of Well Engineered Weld Repairs for Gr. 91 and other Creep Strength Enhanced Ferritic (CSEF) Steels

Objectives and Scope

- Develop and apply well-engineered weld repairs to:
  - Specific components
  - Specific damage mechanisms
  - Other CSEF steels such as Grades 23/24/92



Value

- Increased safety of weld repair through application of a damage tolerant weld design
- Increased inspectability using non destructive evaluation techniques
- Partners will hold one meeting per year to prioritize and agree on broader collaboration

Details and Contact

- The participant cost is $30k/year with a three years minimum commitment
- Qualifies for Tailored Collaboration (TC) and Self-Directed Funds (SDF)

John Siefert or Jonathan Parker

- jsiefert@epri.com; 704-595-2886
- jparker@epri.com; 704-595-2791

SPN Number: 3002004332

Effectively transfer welding and repair technology through targeted repairs for CSEF Steels

EPRI | ELECTRIC POWER RESEARCH INSTITUTE

Acknowledgements

- Aside from the principal investigators, there were numerous members and industry experts who contributed to the document:
  - Tim Bacha, Steve Brett, Mike Crichton, David Finch, Phil Flenner, George Galanes, Charles Henley Jeff Henry, Graham Holloway, Erick Liebl, Spencer Luke, Ken Mitchell, Bill Newell, Adam Storey, Bob Worthington

- Contributions from others are welcome and this is by no means an "invitation-only list"

EPRI | ELECTRIC POWER RESEARCH INSTITUTE

Introduction

- *Best Practice Guideline for Well-Engineered Weld Repair of Grade 91 Steel* (EPRI Report 3002003383) has been made publically available and is available:
  - http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000003002003833

- This guideline should be considered as a document which initiates a review process with the National Board for inclusion of material-specific repair methods into the NBIC not currently covered by Welding Method 6

Purpose

- This guideline describes **best practices** which should be used for fabrication of a **well-engineered weld repair** using **alternative** strategies for ***post-construction*** mitigation of damaged Grade 91 steel components.
  - Although emphasis is on alternative weld repair techniques, the guidance can be utilized to assist in the development of welding procedures where "traditional" PWHT is required

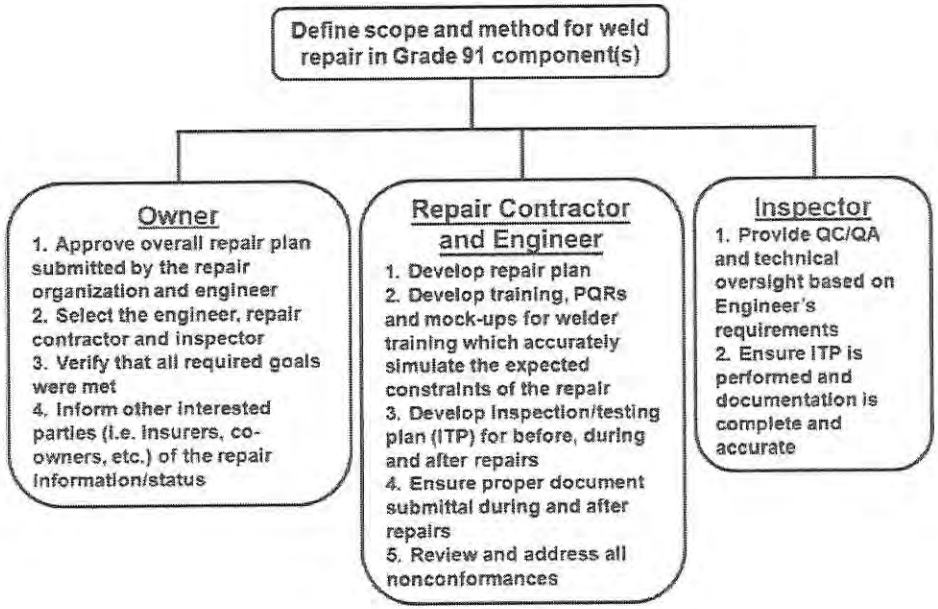
Sections

- Introduction
- Responsibilities
- Acceptable weld repair methods
- General guidelines
- Qualification
- Training and familiarization
- Repair roadmap
- Root cause analysis
- Assessment of base metal
- Selection of welding procedure
- Excavation of defects
- Geometry of weld repair
- Fill technique
- PWHT guidance (where applicable)
- NDE of weld repair
- Post-repair testing
- Post-repair inspection intervals
- Avoidance of stress corrosion cracking
- Conclusions
- References
- 9 Appendices

EPRI | ELECTRIC POWER RESEARCH INSTITUTE

Responsibilities

- Responsibilities and expectations must be defined for each stakeholder in the repair process:
  - Owner/User
  - Responsible Engineer
  - Repair Contractor
  - Repair Contract Inspector
  - Verification Inspector (or Owner's Inspector)
  - Inspector
  - Quality Assurance
  - Quality Control



EPRI | ELECTRIC POWER RESEARCH INSTITUTE

Acceptable Weld Repair Methods

Filler	Method	PWHT	Filler Metal AWS Classification	
Matching	Controlled Fill	1250°F (675°C)[1]	SMAW	E9015-B9[A]
			FCAW	E91T1-B9[A]
			GTAW	ER90S-B9[A]
9Cr-1Mo		None	SMAW	E8015-B8
			FCAW	E81T1-B8
			GTAW	ER80S-B8
Ni-base			SMAW	ENiFeCr-4[B], ENiCrFe-2[C], ENiCrFe-3[D]
			FCAW	None
			GTAW	ERNiCrFe-4[B], ERNiCr-3[E]

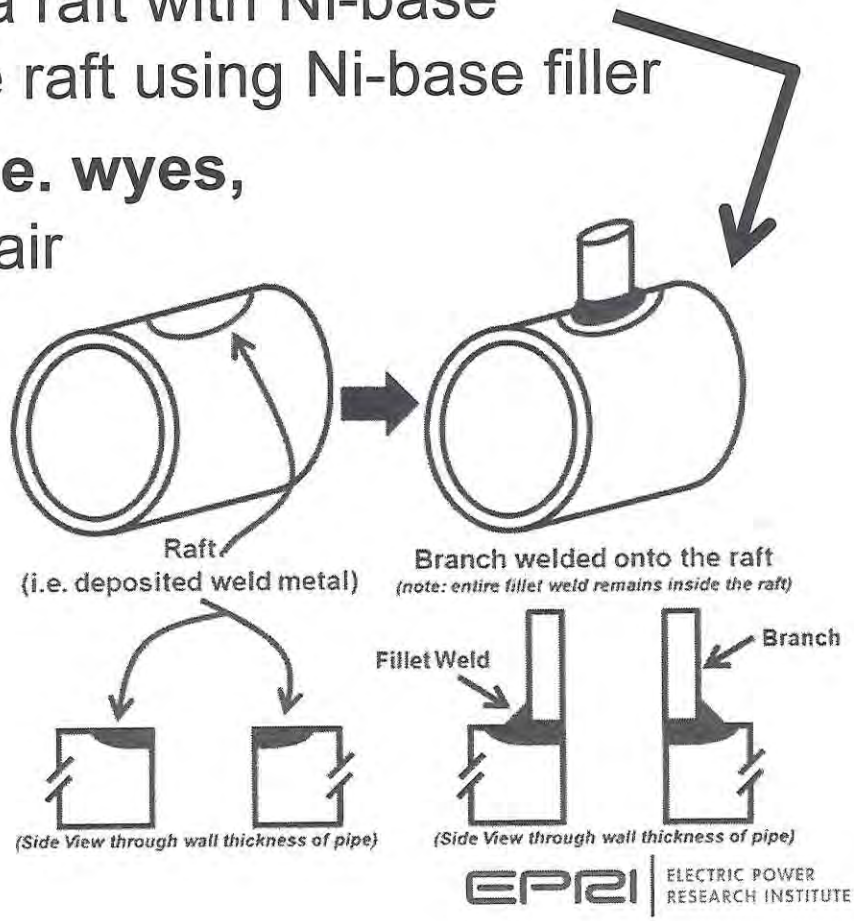
[1]Minimum time at PWHT temperature to be conducted to requirements in applied construction code
[A]B91 classification is pending for the various Grade 91 matching filler metal product forms
[B]Also known as EPRI P87 filler metal
[C]Also known as INCO-WELD A
[D]Also known as INCONEL 182
[E]Also known as Filler Metal 82

Note: *INCONEL and INCO-WELD are registered trademarks of the Special Metals Corporation family of companies*

EPRI | ELECTRIC POWER RESEARCH INSTITUTE

General Guidelines have been Provided for Each of the Three Welding Methods

- Selection, application and approach for excavation of a given weld repair method is a complex process
  - **For stub to header welds**, a raft with Ni-base filler and weld the stub to the raft using Ni-base filler
  - **For welded components (i.e. wyes, tees, branches)**, a local repair using E8015-B8 until the component can be replaced with a forging
  - **For through-thickness girth welds**, E9015-B9 with a step weld and low PWHT



How One Utility Classified Repair Procedures and the Issue of Permanent vs. Temporary

- "TVA employs two types of repair welding procedures. The first is the so-called "permanent repair", and the second "temporary repair." **These terms have little meaning in a literal sense. The choice of the terminology was made for the following reason: permanent repair includes stress-relief.** We use a welding electrode very compatible to the base material and apply a full stress-relief to alleviate the low ductility in the HAZ. We consider that a permanent repair."

From: "TVA's Experience with Casings." *Workshop Proceedings: Life Assessment and Repair of Steam Turbine Casings*. EPRI, Palo Alto, CA: CS-4676-SR. [July 1986]

EPRI | ELECTRIC POWER RESEARCH INSTITUTE

Permanent vs. Temporary Repair is not a Function of PWHT, but of Design, Damage and Welding Procedure

- "For temporary repairs, two different procedures are used – one with an Inconel electrode and another with a low-alloy electrode. These procedures do not include stress-relief. At some later date, we will remove that temporary repair and put in a permanent repair when we have time, when it is economical and feasible, and other conditions are met.
- **But temporary repairs sometimes run for 15 years, and permanent repairs sometimes crack again after three years. So one cannot call either one permanent or temporary – the quality of the repair seems to be a function of the stress and the thermal cycles for that particular part of the casing."**

From: "TVA's Experience with Casings." *Workshop Proceedings: Life Assessment and Repair of Steam Turbine Casings.* EPRI, Palo Alto, CA: CS-4676-SR. [July 1986]

EPRI | ELECTRIC POWER RESEARCH INSTITUTE

Qualification

- Where defects were not present in the as-deposited filler metal, there were no issues in qualifying:
  - E9015-B9 + Low PWHT
  - Ni-base + No PWHT
- The only issue arising in qualification was ensuring that E8015-B8 had sufficient ductility to pass the standard 2T side bend test
  - Documented elongation in the filler metal and in the as-welded condition is 14% (as opposed to minimum of 18% for SA-387 Grade 91)
  - **NBIC should consider relaxed qualification requirements for side bend testing of E8015-B8 repairs**
- Language/discussion added to invalidate requirements for QW-290 (i.e. "temper bead" rules)

EPRI | ELECTRIC POWER RESEARCH INSTITUTE

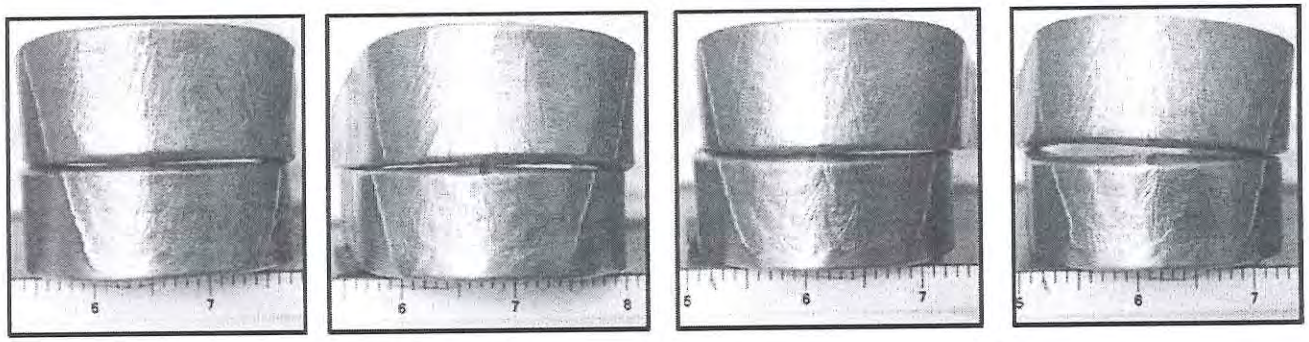
Example of an ASME B&PV Code Section IX PQR Results (Results shown for E9015-B9 + Low PWHT)

Sample	UTS[1]		Failure Location
	ksi	MPa	
RTT1a	100.6	693.8	Base
RTT1b	100.4	692.4	Base
RTT2a	100.8	695.2	Base
RTT2b	100.0	689.7	Base

[1]UTS = Ultimate Tensile Strength. The minimum UTS for SA-387 Grade 91 is 85 ksi

Bend[1,2]	Results	Comments
1a	Pass	No Cracks Observed
1b	Pass	No Cracks Observed
2a	Pass	<1/8" Crack Observed
2b	Pass	No Cracks Observed
3a	Pass	No Cracks Observed
3b	Pass	No Cracks Observed
4a	Pass	No Cracks Observed
4b	Pass	No Cracks Observed

[1]"a" are the "top" bend tests
[2]"b" are the "bottom" bend tests



EPRI ELECTRIC POWER RESEARCH INSTITUTE

Training and Familiarization

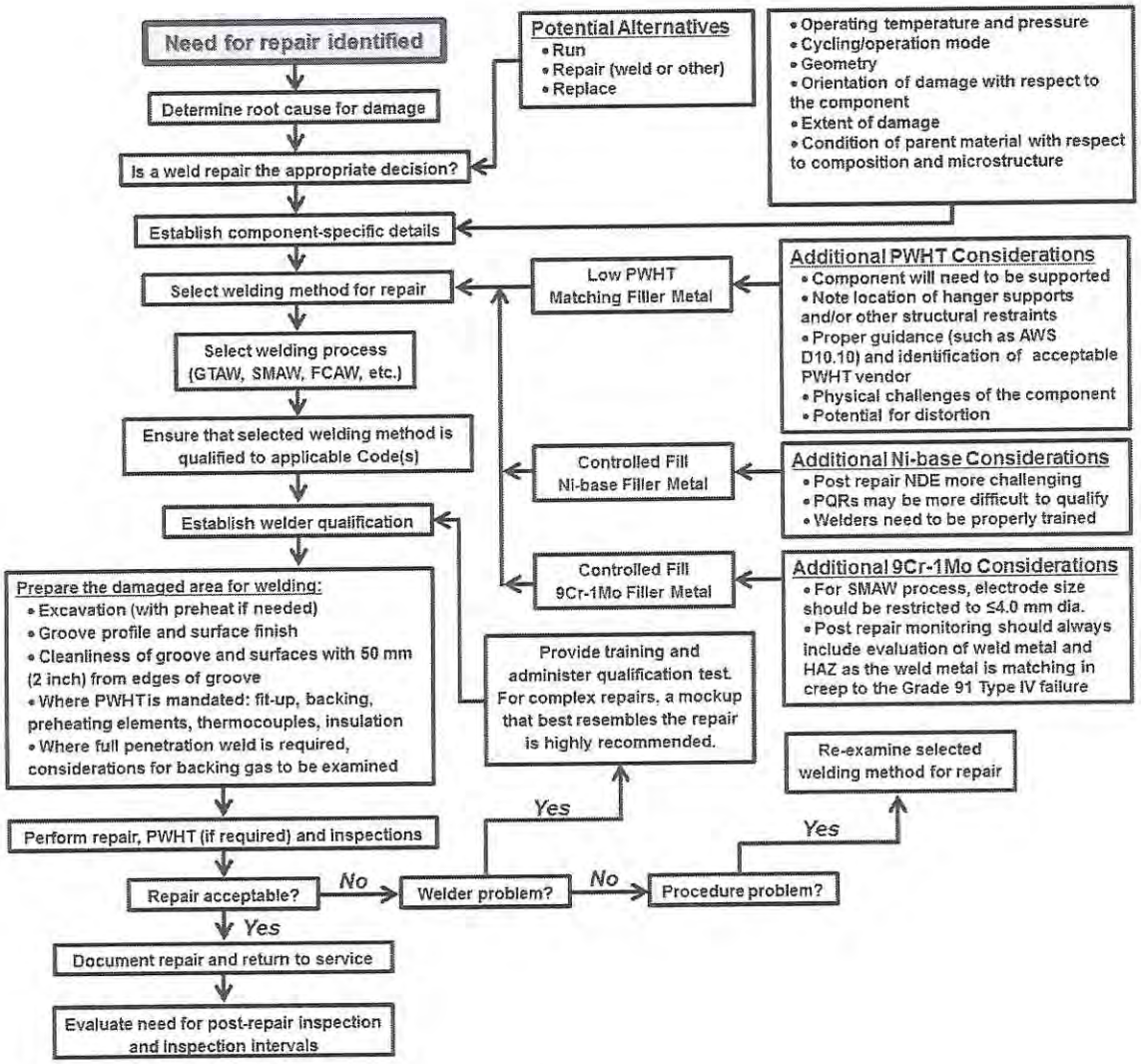
- Must be conscious of the craft labor (capabilities and nationalities)
  - Mock-ups
  - Ni-base versus Fe-base
  - Native language?
  - "TVA uses some special techniques on turbine casings. One is to run mock-up tests. For configurations that restrict access to the weld, it is often necessary to use mirror welding. In such a case, we use a mock-up test to familiarize the welders with the weld area."

From: "TVA's Experience with Casings." *Workshop Proceedings: Life Assessment and Repair of Steam Turbine Casings*. EPRI, Palo Alto, CA: CS-4676-SR. [July 1986]

The use of mock-up tests and careful screening will always be a necessity. The stakes for a weld repair are higher and there may be little margin for error

EPRI | ELECTRIC POWER RESEARCH INSTITUTE

Repair Roadmap



- This roadmap is not all-inclusive, but intended to be a starting point for the engineer and end-user to write a specification and identify critical steps in the repair process

EPRI ELECTRIC POWER RESEARCH INSTITUTE

Root Cause Analysis

- The type of damage
- Location/extent of damage
- And issues in design, operation, fabrication and construction are critical to outlining a well-engineered repair

Design

- Welded construction (i.e. flat end-caps, wyes, tees)
- System loads
- Cold spring
- DMWs
- WSRFs

Operation

- Temperatures above design
- High system loads
- Transients, cycling

Fabrication

- Composition of materials
- Lack of monitoring of preheat, interpass or PWHT
- Excessive PWHT
- Excessive tempering

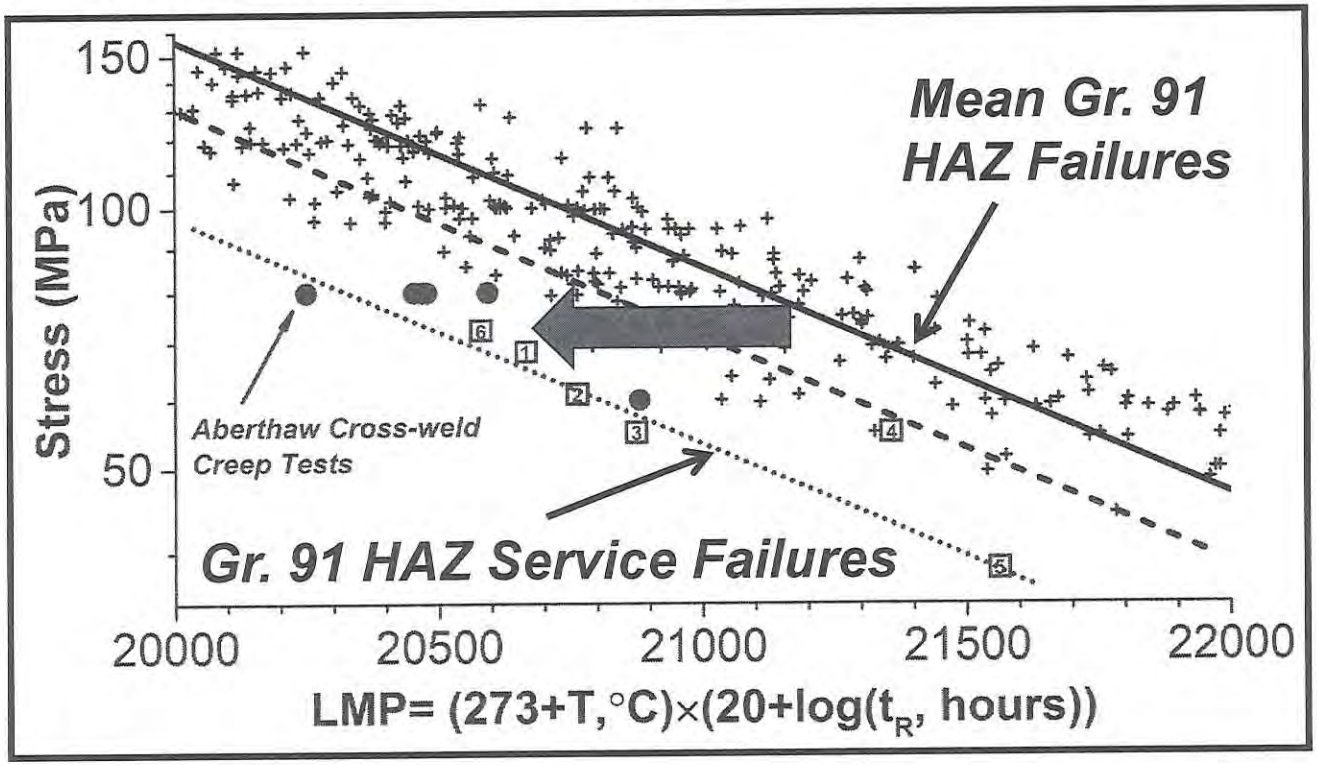
Construction

- Temporary weld attachments
- Lack of control of welding consumables
- Repair/remediation
- Quality assurance
- Documentation of work actually performed

EPRI | ELECTRIC POWER RESEARCH INSTITUTE

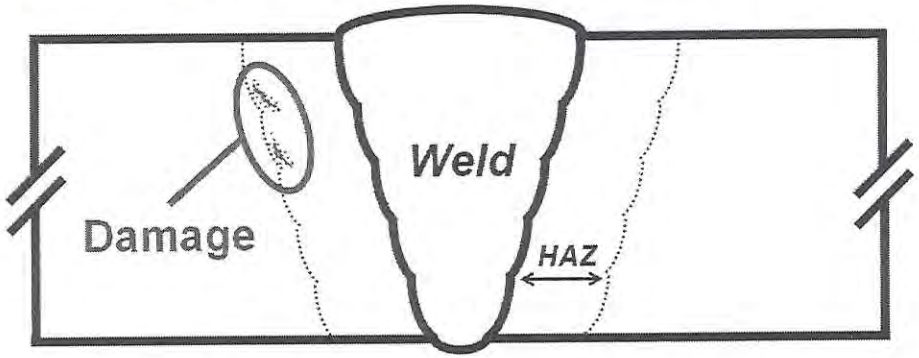
Assessment of Base Metal Condition

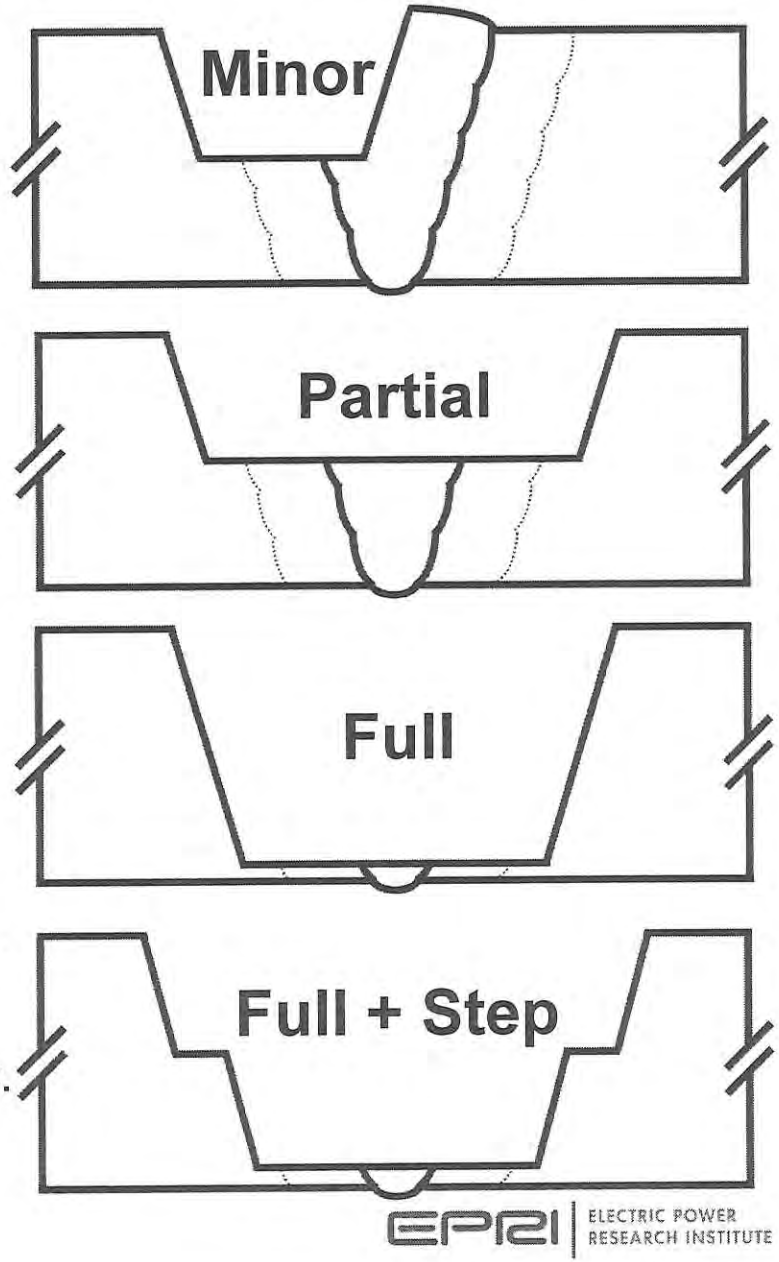
- This is a complex topic that warrants more detail and is the subject of on-going research in Program 87
- **Even a well-engineered weld repair in poorly performing material cannot improve the performance of this material**



EPRI ELECTRIC POWER RESEARCH INSTITUTE

Excavation of Damage Requires a Well-Engineered Approach



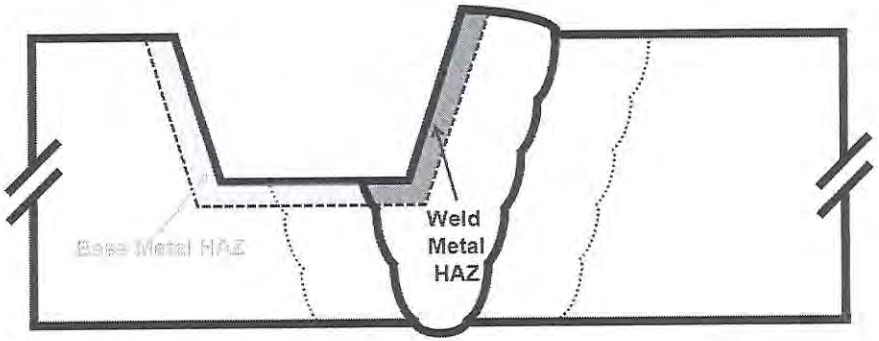


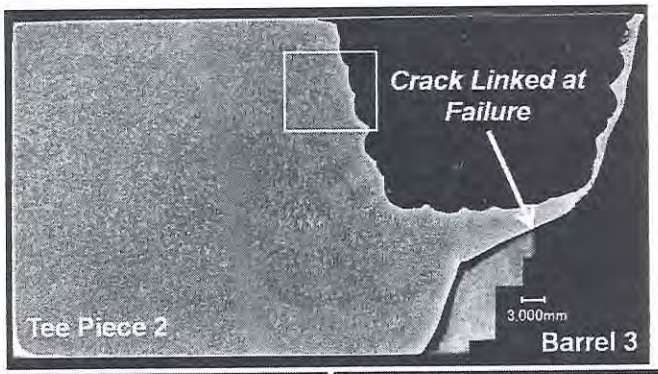
- Where damage is identified in a specific location, key questions arise:
  - Is the parent material identical on both sides of the weld? If not:
    - Composition vastly different?
    - Manufacturing route for material?
      - i.e. Pipe vs. forging vs. casting
  - Is damage expected to be isolated, or present through the thickness of the HAZ?
  - What is the geometry of the weldment?
    - i.e. compound bevel vs. single bevel etc.
  - Urgency of the repair and need for a permanent solution

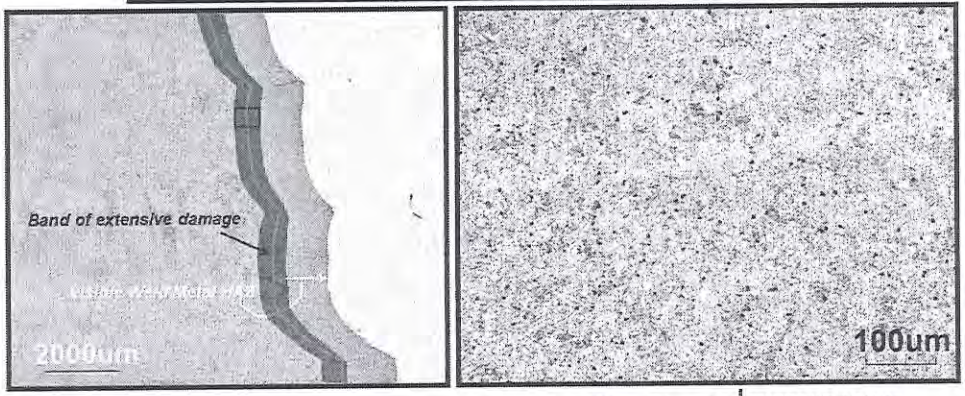
EPRI | ELECTRIC POWER RESEARCH INSTITUTE

Repair where the Damage is Excavated with a "Minor Repair" is not Optimal

- In this scenario, a weld metal HAZ is created in the as-deposited filler metal
  - In some cases, extensive damage has been documented in this scenario in EPRI testing
  - Furthermore, "**If weld repairs of CSEF steels are required, it is absolutely essential to avoid making HAZ formed in ex-service weld metal**"
    - From: Kubushiro et al. "Microstructure and Creep Property of Long-term Serviced Mod. 9Cr-1Mo Steels after Repair Welding." *2014 PVP Conference*.







EPRI ELECTRIC POWER RESEARCH INSTITUTE

Controlled Fill Technique – 6 Simple Rules

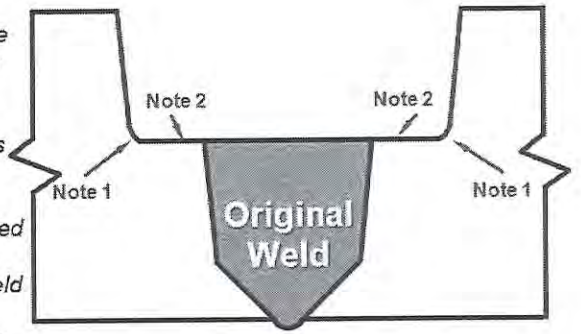
1. Weld starting on the bevel and working to the center of the excavation
2. 50% overlap bead to bead
3. Stringer beads only
4. 300°F (150°C) minimum preheat
5. 550°F (290°C) maximum interpass
6. Electrode diameter limitation
   - **Fe-base:** 2.5 mm (3/32 inch) or 3.2 mm (1/8 inch)
   - **Ni-base:** 3.2 mm (1/8 inch) for beads in contact with bevel and 3.2 mm (1/8 inch) or 4.0 mm (5/32 inch) for fill

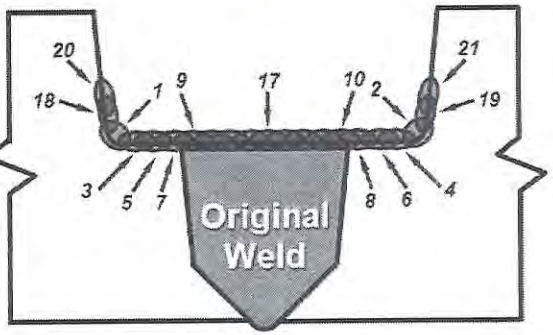
Notes:

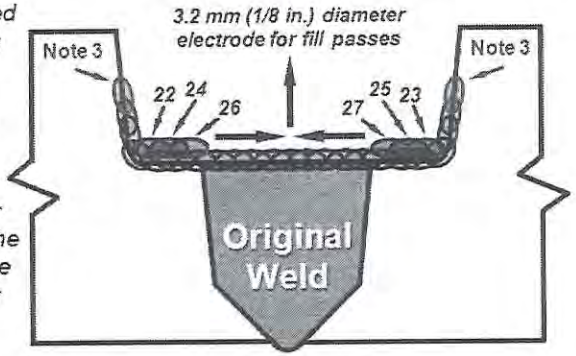
1. *The excavation should have rounded corners to prevent lack of fusion. It may be advisable to use a smaller diameter electrode (such as 2.5 mm or 3/32 in.) to ensure good tie in.*
2. *The step should be machined at least 10 mm beyond the fusion line of the original weld*
3. *The fill passes along 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*



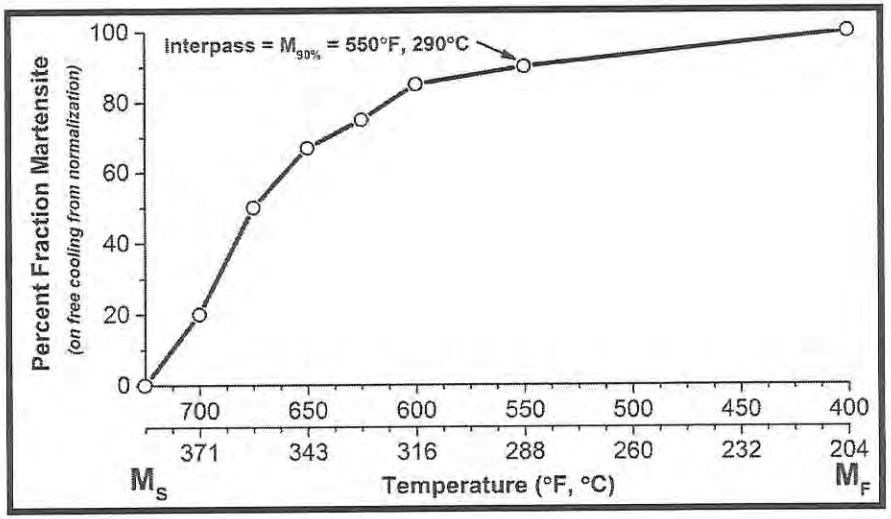


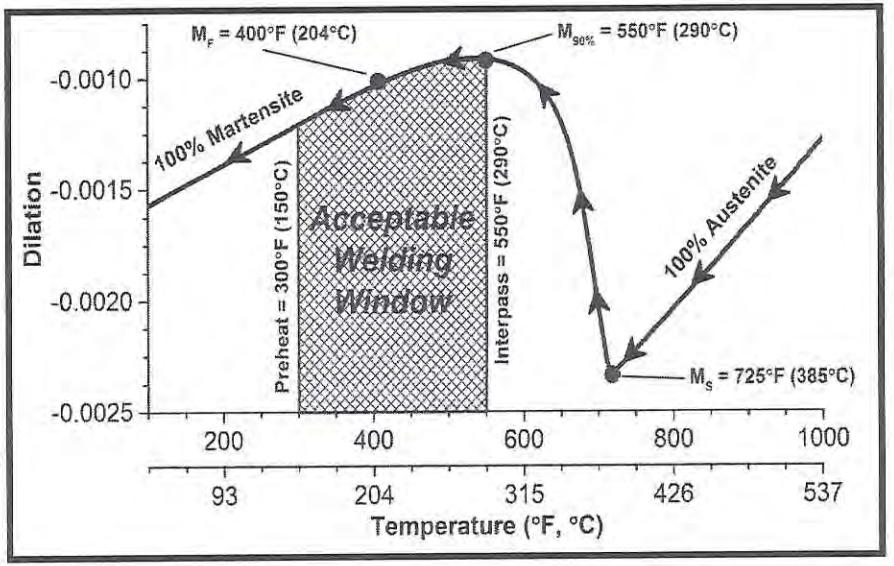


EPRI | ELECTRIC POWER RESEARCH INSTITUTE

Justification for Preheat and Interpass Recommendations

- The "acceptable welding window" has been defined by practical and scientific limits:
  - Preheat of 300°F (150°C) to avoid hydrogen induced cracking
  - Interpass of 550°F (290°C) to promote tempering within a layer (i.e. bead to bead)
  - This does not mandate a lower minimum preheat should an end-user wish to utilize a preheat of ~400°F (204°C) or if a construction code mandated it





EPRI ELECTRIC POWER RESEARCH INSTITUTE

Post Weld Heat Treatment (PWHT) Guidance is beyond that of AWS D10.10

- Pads must wrapped onto the parts without gaps and never overlap
- Minimize gaps between heating pads
- In addition to AWS D10.10, it is recommended to have at least one thermocouple installed under each pad
- Thermocouples under pads must be insulated
- A single control thermocouple should not control multiple heaters
- Monitoring or control thermocouples should be located underneath pads in the location of the expected highest temp.
- For thickness transitions, mandate multiple control zones
- Redundancy of control thermocouples
- If possible, ID should be monitored
- Single point monitoring is unacceptable
- Avoid excessively high ramp rates

EPRI | ELECTRIC POWER RESEARCH INSTITUTE

NDE and Post Repair Testing

- NBIC NB-23 requires that all repairs to pressure-retaining items shall be verified by examination or test. Liquid pressure testing, also known as hydro-testing, is widely used for this purpose.
  - 2013 Edition of the NBIC Part 3, Table 4.4.2
- The NBIC does not restrict post-repair testing to only liquid pressure tests; alternate testing methods are recognized in NBIC, Part 3, 4.4.1
  - Based on critical flaw size calculations, a minimum critical flaw size of ~0.10 inch (3 mm) should be detected by the selected NDE method.
- Post-repair inspection is not 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.

EPRI | ELECTRIC POWER RESEARCH INSTITUTE

Stress Corrosion Cracking – 3 Simple Rules

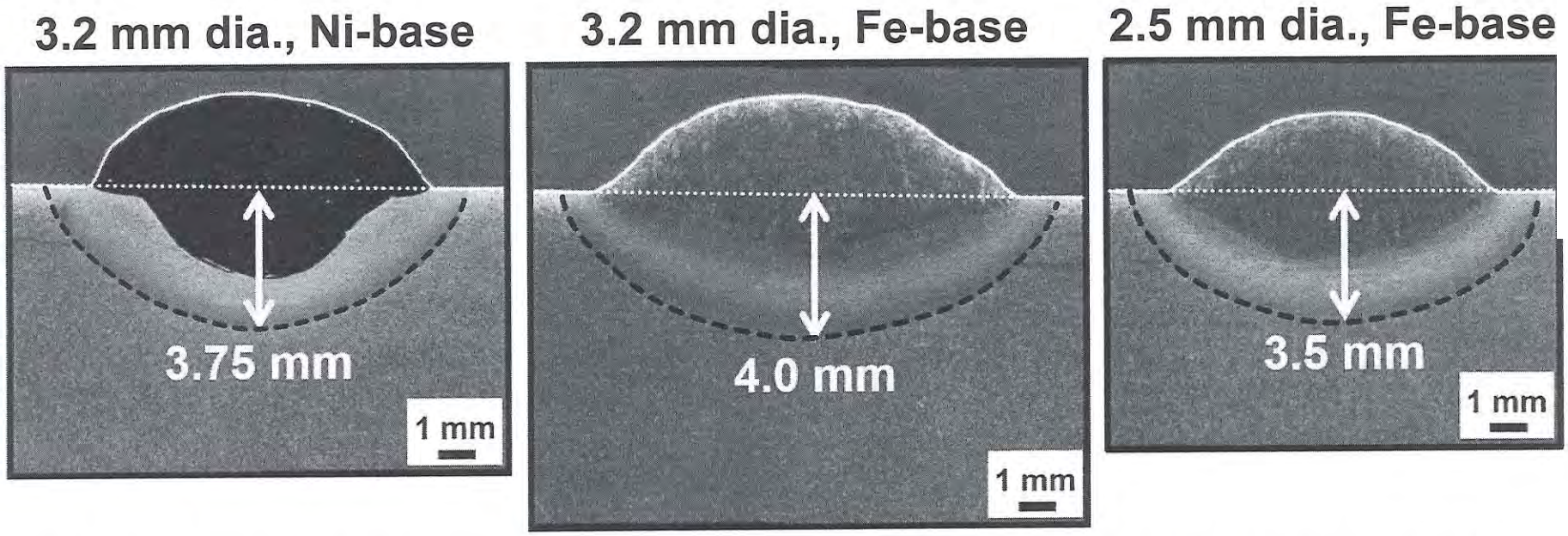
- ***Rule 1 – Apply and keep dry***
  - The outside diameter of the weld repair should be coated with a water-resistant coating including ~1 inch (25 mm) beyond the weld on either side of the fusion line
    - Vaseline, paint, WD-40, Crisco, etc.
  - The weldment be properly protected from all moisture or preserved "dry" prior to unit startup, especially where the piping is directly exposed to the environment, such as in some combined cycle power plants.

Stress Corrosion Cracking – 3 Simple Rules

- ***Rule 2 – Full penetration weld repairs should undergo a PWHT***
  - For weld repairs that must be made using a full penetration weld, it is recommended that the weldment be made using the matching -B9 consumables and a minimum PWHT of 675°C (1250°F)

Stress Corrosion Cracking – 3 Simple Rules

Bead on Plate Experiments – Depth of HAZ in Grade 91 Steel



- ***Rule 3 – When a land can be left for a full penetration weld, limit the diameter of the electrode in direct contact with the land to 2.5 mm (3/32 inch) or use controlled GTAW process***
  - For weld repairs where a land can be left in the weldment, it is recommended that the land be at least 0.20 inch (5 mm) thick to avoid creating an HAZ that is exposed to the ID surface.

EPRI | ELECTRIC POWER RESEARCH INSTITUTE

Appendices

More will be added as-required

- **A** – Filler Metal Compositions, as Listed in ASME B&PV Code Section IIC and Code Cases
- **B** – Common Base Metal Compositions for Grade 91 Product Forms as Listed in ASME B&PV Code Section IIA
- **C** – Exemplar Filler Metal Procurement Form
- **D** – Evaluation of Hardenability of Filler Metal E8015-B9 (9Cr-1Mo)
- **E** – Evaluation of Hardenability of Filler Metal E9015-B9 (9Cr-1Mo-VNbN) in the As-welded and Low PWHT Condition
- **F** – Performance of Through-thickness Weld Repairs in Grade 91 Steel
- **G** – Performance of Weld Repairs Using E8015-B8 Filler Metal and Importance of the Grade 91 Parent Metal Condition
- **H** – Effect of the Weld Repair Quality on Performance
- **I** – Effect of Geometry on the Performance of Weld Repairs in Grade 91 Steel

EPRI | ELECTRIC POWER RESEARCH INSTITUTE

Conclusions

- It is clear that the technical details for "best practice" regarding welding of low alloy bainitic steels do not apply directly to welding of tempered martensitic steel. Thus, repair techniques commonplace for "conventional" low-alloy steels are not directly relevant for repairs on Grade 91 steels.
  - **And the need for an NBIC supplement to address weld repair of Grade 91 steel not covered in Welding Method 6**
- Furthermore, technical definition of the best-option repair in Grade 91 steel components is not a one-size-fits-all approach

EPRI | ELECTRIC POWER RESEARCH INSTITUTE

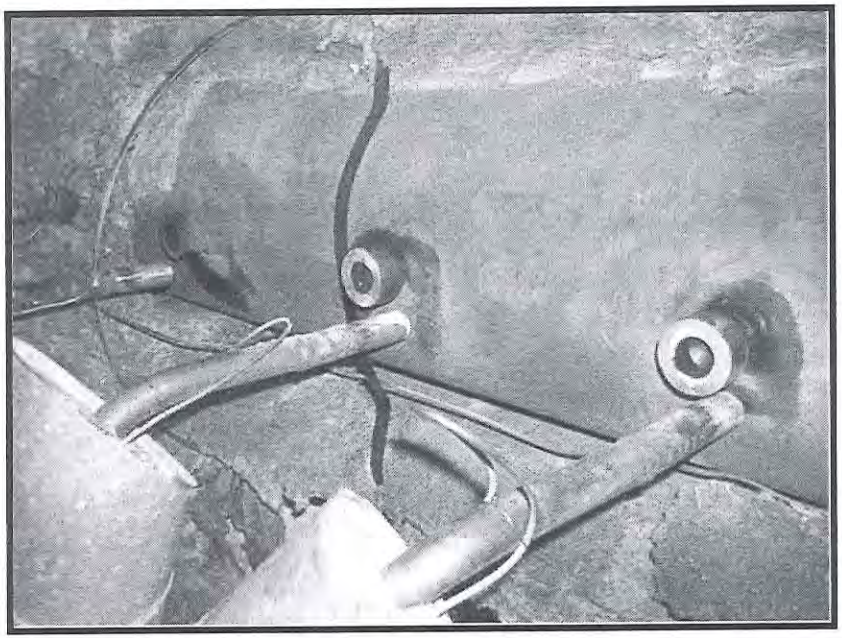
Proposed Path Forward

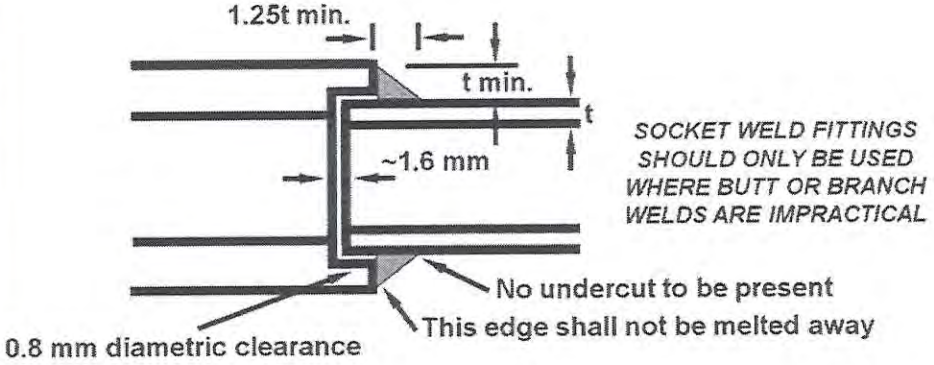
- NBIC committee members to review draft and provide feedback prior to July 2015 meeting
  - EPRI will address any issues, concerns, comments, etc.
- Draft NBIC Supplement covering the balance of repair scenarios for Grade 91 steel to be brought forward by end of 2015 for voting in 2016

EPRI | ELECTRIC POWER RESEARCH INSTITUTE

Weld Repair of Grade 91 Steel is being Performed or Planned Using Procedures without PWHT

- An HRSG unit was brought off load shortly before a planned outage as a result of a steam leak from a small diameter HP superheater outlet pressure impulse line (incorrect material). Temporary repairs to three lines were carried out using nickel-based GTAW socket welds to allow rapid return to service.





From: *Cold Weld Repair of Ferritic Components – Case Studies of UK Power Stations*. EPRI, Palo Alto, CA: 3002003362. 2014.

EPRI | ELECTRIC POWER RESEARCH INSTITUTE

EPRI | ELECTRIC POWER RESEARCH INSTITUTE

Together…Shaping the Future of Electricity

Post Weld Heat Treatment (PWHT) is Complicated

- Additional guidance is provided to supplement AWS D10.10
- Guidance below is for a pipe that is 14 inch OD (356 mm) X 1.25 inch (31.75 mm) wall thickness, horizontally aligned with no thickness transition

Scenario	AWS D10.10	Option 1[A]	Option 2[B]	
Control Band Width	3t	3t	12.8t	19.2t
Heated Band Width	20 inches (508 mm)	49 inches (1245 mm)	20 inches (508 mm)	28 inches (711 mm)
Gradient Control Band Width	30 inches (762 mm)	60 inches (1524 mm)	30 inches (762 mm)	38 inches (965 mm)
Reduction in through-wall temperature gradient	0% (52°F, 29°C)	40%	40% (~30°F, 17°C)	60%
[A]Increase the heated band width				
[B]Change from a soak band width scenario to a control band width scenario				

EPRI | ELECTRIC POWER RESEARCH INSTITUTE

General Guidelines – Considerations for Weld Method 1 (Matching + PWHT)

- Matching filler metal is used
- Electrode size restricted to ≤ 5/32 inch (4.0 mm) dia.
- Low PWHT decreases the potential for excessive tempering in the HAZ or base material
- Low PWHT will decrease risk of exceeding the AC_1 for Grade 91
- Low PWHT can be expected to relieve some or most of the welding residual stresses in the component
- Recommend minimum PWHT temperature (1250°F, 675°C) is below ASME B&PV Code minimum specified in Sec. I or B31.1
- Restraints and accommodation of thermal expansion stresses during PWHT need to be addressed
- Where charpy impact toughness tests are required, a low PWHT may not be sufficient to meet the specified requirements

EPRI | ELECTRIC POWER RESEARCH INSTITUTE

General Guidelines – Considerations for Weld Method 2 (9Cr-1Mo + No PWHT)

- Filler metal matches the creep strength of the Grade 91 HAZ
- Filler metal is less hardenable than matching filler metal and tempers more readily during welding and in service
- No concern for carbon migration as the Cr content is matching to Grade 91 steel
- Electrode size should always be restricted to ≤ 5/32 inch (4.0 mm) in diameter and more preferably to ≤ 1/8 inch (3.2 mm)
- Post-repair inspection and inspection intervals will need to include weld metal and HAZ
  - Depending on the creep strength of the base metal, damage may occur in either the HAZ or weld metal or both

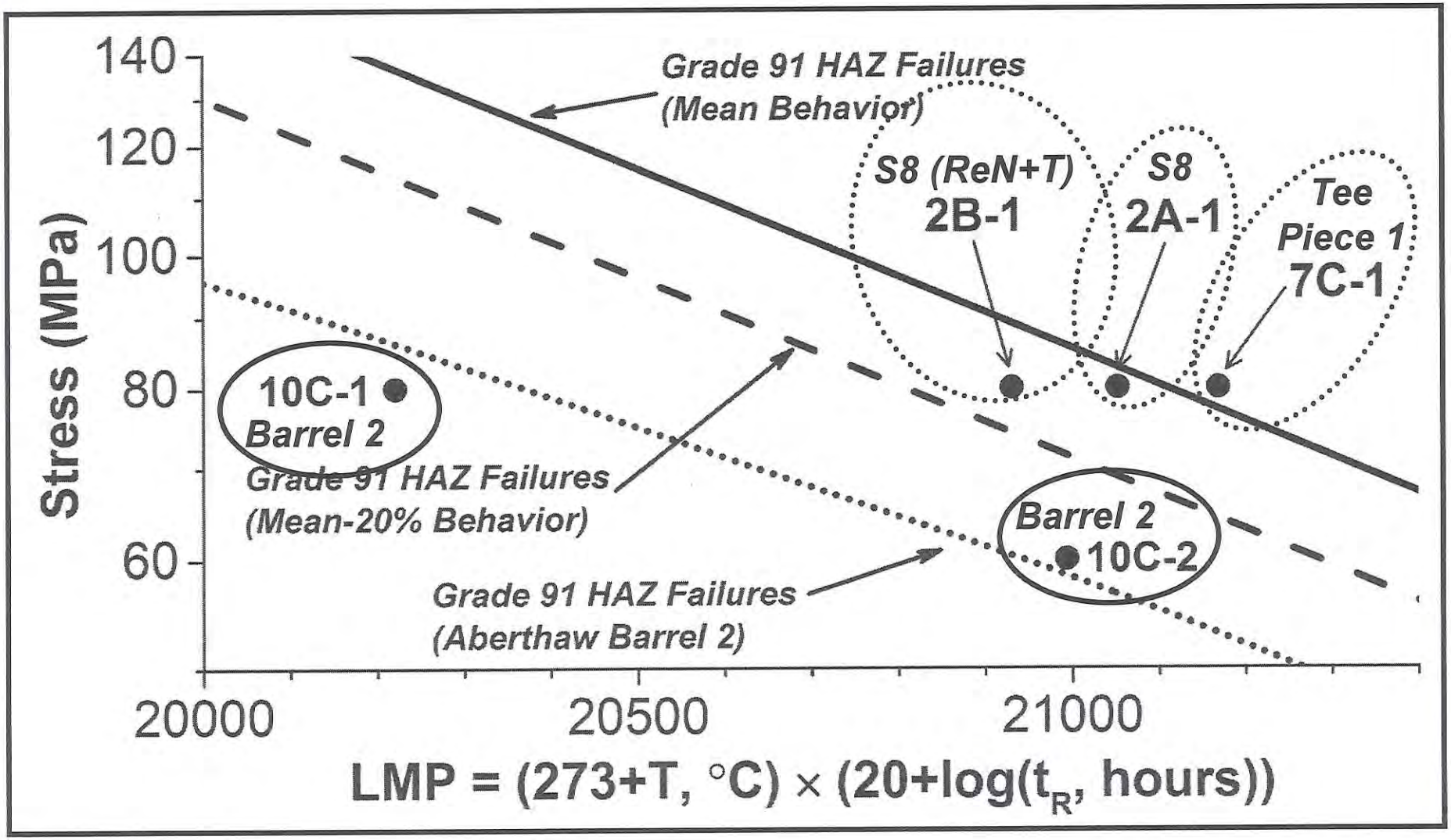
EPRI | ELECTRIC POWER RESEARCH INSTITUTE

General Guidelines – Considerations for Weld Method 3 (Ni-base+ No PWHT)

- The electrode size for fill passes against the bevel should be 1/8 inch (3.2 mm) diameter
- The electrode size for all fill passes can be 5/32 inch (4.0 mm) diameter
- Increased defect tolerance in weld metal
- NDE is more challenging during the repair and following repair
- Tendency to form microfissures and/or lack of fusion defects
  - The defects have not been shown to contribute to a reduction in performance
- The skill of the welder can be an important variable
- The temperature of the component as welding residual stresses may not relax rapidly at temperatures <550°C (1022°F)
- Post-repair inspection and inspection intervals will need to include fusion line and HAZ as there may be a risk for damage in both locations and consistent with reported DMW failures

EPRI | ELECTRIC POWER RESEARCH INSTITUTE

Results for Four Parent Metal Conditions and the Same Welding Procedure (E9015-B9 + Low PWHT)



EPRI ELECTRIC POWER RESEARCH INSTITUTE

Controlled Fill Technique Schematics

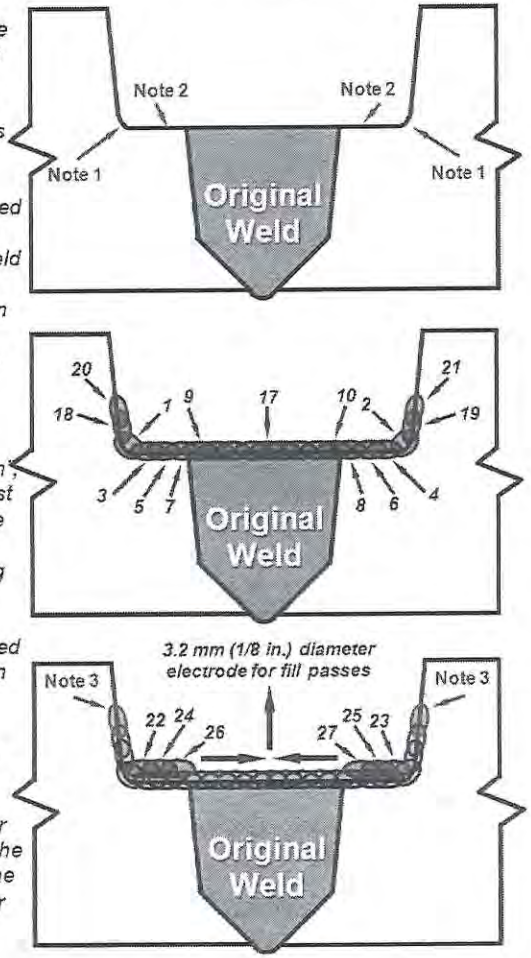
Partial Weld Repair

Notes:

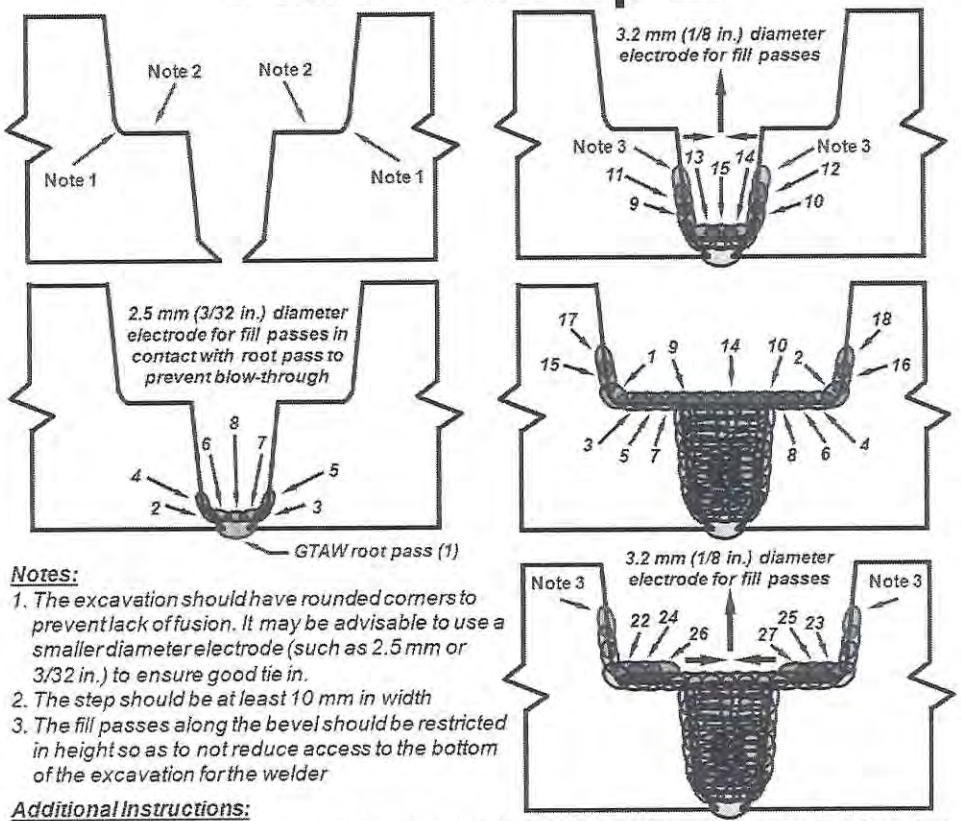
1. The excavation should have rounded corners to prevent lack of fusion. It may be advisable to use a smaller diameter electrode (such as 2.5 mm or 3/32 in.) to ensure good tie in.
2. The step should be machined at least 10 mm beyond the fusion line of the original weld
3. The fill passes along the bevel 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



Full Weld Repair



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 at least 10 mm in width
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

EPRI ELECTRIC POWER RESEARCH INSTITUTE

Action Item Request Form

NB15-1404

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:

Part 3
1.6.1
Materials

i) 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.

3.2.1 MATERIAL REQUIREMENTS FOR REPAIRS AND ALTERATIONS

a) The materials used in making repairs or alterations shall conform insofar as possible to the original code of construction or construction standard or code selected, including the material specification requirements used for the work planned. Carbon or alloy steel having a carbon content of more than 0.35% shall not be welded unless permitted by the original code of construction. The "R" Certificate Holder is responsible for verifying identification of existing materials from original data, drawings, or pressure-retaining item records, and identification of the materials to be installed. Consideration shall be given to the condition of the **existing material**, especially in the weld preparation area. If the **existing material** cannot be verified (unknown), the "R" Certificate Holder shall perform a chemical analysis and hardness testing, as a minimum, of the unknown material to verify its weldability and strength or may elect to qualify a weld procedure. If there is a question with regard to the weldability characteristics of the material, then competent technical advice should be obtained.

b) Statement of Need

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

1. Repair organizations are required to add to the quality manual a description of how **existing material** is identified. In 1.6.1 i)

2. Organizations are required to consider and verify existing **material** as part of their responsibility in 3.2.1 a)

These organizations are somewhat confused what is meant by existing material in NBIC Part 3.

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.

This was discussed at the NBIC Subgroup Repair and Alteration meeting on January 20, 2015.

These organizations are somewhat confused what existing material is meant in NBIC Part 3. They have asked to add a definition or explanation in Part 3 as what is meant by existing material.

d) Task Group Assigned

Project Manager: Wayne Jones,

Members: Marty Toth, Joel Amato, and Rob Trout

c) The opening in the pressure vessel wall shall be designed to provide unobstructed flow between the vessel and its pressure relief device.

d) When two or more required pressure relief devices are placed on one connection, the inlet cross-sectional area of this connection shall be sized either to avoid restricting flow to the pressure relief devices or made at least equal to the combined inlet areas of the pressure relief devices connected to it. The flow characteristics of the upstream system shall satisfy the requirements of NBIC Part 1, 4.5.6 a).

e) There shall be no intervening stop valves between the vessel and its pressure relief device(s), or between the pressure relief device(s) and the point of discharge, except under the following conditions:

1) When these stop valves are so constructed or positively controlled that the closing of the maximum number of block valves at one time will not reduce the pressure relieving capacity below the required relieving capacity; or,

2) Upon specific acceptance of the Jurisdiction, when necessary for the continuous operation of processing equipment of such a complex nature that shutdown of any part is not feasible, a full area stop valve between a pressure vessel and its pressure relief device should be provided for inspection and repair purposes only. This stop valve shall be arranged so that it can be locked or sealed open, and it shall not be closed except by an authorized person who shall remain stationed there during that period of operation while the valve remains closed. The valve shall be locked or sealed in the open position before the authorized person leaves the station.

3) A full area stop valve should also be placed on the discharge side of a pressure relief device when its discharge is connected to a common header for pressure relief devices to prevent discharges from these other devices from flowing back to the first device during inspection and repair. This stop valve shall be arranged so that it can be locked or sealed open, and it shall not be closed except by an authorized person who shall remain stationed there during that period of operation while the valve remains closed. The valve shall be locked and sealed in the open position before the authorized person leaves the station. This valve shall only be used when a stop valve on the inlet side of the pressure relief device is first closed.

4) A pressure vessel in a system where the pressure originates from an outside source should have a stop valve between the vessel and the pressure relief device, and this valve need not be sealed open, provided it also closes off that vessel from the source of the pressure.

5) Pressure vessels designed for human occupancy (such as decompression or hyperbaric chambers) shall be provided with a quick opening stop valve between the pressure vessel and its pressure relief valve. The stop valve shall be normally sealed open with a frangible seal and be readily accessible to the pressure relief attendant.

f) Pressure relief device discharges shall be arranged such that they are not a hazard to personnel or other equipment and, when necessary, lead to a safe location for disposal of fluids being relieved.

g) Discharge lines from pressure relief devices shall be designed to facilitate drainage or be fitted with drains to prevent liquid from collecting in the discharge side of a pressure relief device. The size of discharge lines shall be such that any pressure that may exist or develop will not reduce the relieving capacity of the pressure relief device or adversely affect the operation of the pressure relief device. It shall be as short and straight as possible and arranged to avoid undue stress on the pressure relief device.

h) Pressure relief devices shall be installed so they are readily accessible for inspection, repair, or replacement.

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.

5.3.3 LOCATION

Pressure relief devices, except those covered by Sections 2 and 3 of this Part, may be installed at any location in the system provided the pressure in any portion of the system cannot exceed the maximum overpressure permitted by the original code of construction. Pressure drop to the pressure relief device under flowing conditions shall be considered when determining pressure relief device location. The pressure-relief device shall not be isolated from the piping system except as permitted by NBIC Part 1, 5.3.6 e).

5.3.4 CAPACITY

a) The pressure relief device(s) shall have sufficient capacity to ensure that the piping is not exposed to pressures greater than that specified in the original code of construction.

b) When a non-reclosing device is installed between a pressure relief valve and the pipe, the reduction in capacity due to installation of the non-reclosing device shall be determined in accordance with the code of construction by use of a National Board certified Combination Capacity Factor (CCF). For rupture disks, if a certified combination capacity factor is not available, the capacity of the pressure relief valve shall be multiplied by 0.9 and this value used as the capacity of the combination installation.

c) The owner shall document the basis for selection of the pressure relief devices used, including capacity, and have such calculations available for review by the Jurisdiction, when required.

5.3.5 SET PRESSURE

a) When a single pressure relief device is used, the set pressure marked on the device shall not exceed the maximum allowable working pressure, except when allowed by the original code of construction.

b) When more than one pressure relief device is provided to obtain the required capacity, only one pressure relief device set pressure needs to be at the maximum allowable working pressure. The set pressures of the additional pressure relief devices shall be such that the pressure cannot exceed the overpressure permitted by the code of construction.

5.3.6 INLET AND DISCHARGE PIPING REQUIREMENTS

a) The opening through all pipes and fittings between a piping system and its pressure relief device shall have at least the area of the pressure relief device inlet. The characteristics of this upstream system shall be such that the pressure drop will not reduce the relieving capacity below that required or adversely affect the operation of the pressure relief device.

b) A non-reclosing device installed between a piping system and a pressure relief valve shall meet the requirements of NBIC Part 1, 5.3.6 a).

c) The opening in the pipe shall be designed to provide unobstructed flow between the pipe and its pressure relief device.

d) When two or more required pressure relief devices are placed on the connection, the inlet cross-sectional area of this connection shall be sized either to avoid restricting flow to the pressure relief devices or made at least equal to the combined inlet areas of the pressure relief devices connected to it. The flow characteristics of the upstream system shall satisfy the requirements of NBIC Part 1, 5.3.6 a).

e) There shall be no intervening stop valves between the piping system and its pressure relief device(s), or between the pressure relief device(s) and the point of discharge except under the following conditions:

   1) When these stop valves are so constructed or positively controlled that the closing of the maximum number of block valves at one time will not reduce the pressure relieving capacity below the required relieving capacity;

   2) Upon specific acceptance of the Jurisdiction, when necessary for the continuous operation of processing equipment of such a complex nature that shutdown of any part is not feasible, a full area stop valve between a piping system and its pressure relief device should be provided for inspection and repair purposes only. This stop valve shall be arranged so that it can be locked or sealed open and it shall not be closed except by an authorized person who shall remain stationed there during that period of operation while the valve remains closed. The valve shall be locked or sealed in the open position before the authorized person leaves the station;

   3) A full area stop valve may be placed on the discharge side of a pressure relief device when its discharge is connected to a common header for pressure relief devices to prevent discharges from these other devices from flowing back to the first device during inspection and repair. This stop valve shall be arranged so that it can be locked or sealed open, and it shall not be closed except by an authorized person who shall remain stationed there during that period of operation while the valve remains closed. The valve shall be locked or sealed in the open position before the authorized person leaves the station. This valve shall only be used when a stop valve on the inlet side of the pressure relief device is first closed; or

   4) A piping system where the pressure originates from an outside source should have a stop valve between the system and the pressure relief device, and this valve need not be sealed open, provided it also closes off that vessel from the source of pressure.

f) Pressure relief device discharges shall be arranged such that they are not a hazard to personnel or other equipment and, when necessary, lead to a safe location for disposal of fluids being relieved.

g) Discharge lines from pressure relief devices shall be designed to facilitate drainage or be fitted with drains to prevent liquid from collecting in the discharge side of a pressure relief device. The size of discharge

The quality system shall include:

1) Measures to control the issuance of and revisions to the quality system manual;

2) Provisions for a review of the system in order to maintain the manual current with these rules and the applicable sections of the ASME Code;

3) The title(s) of the individual(s) responsible for control, revisions, and review of the manual;

4) Provision of a controlled copy of the written quality system manual to be submitted to the National Board; and

5) Revisions shall be submitted for acceptance by the National Board prior to being implemented.

o) Nonconformities

The system shall establish measures for the identification, documentation, evaluation, segregation, and disposition of nonconformities. A nonconformity is a condition of any material, item, product, or process in which one or more characteristics do not conform to the established requirements. These may include, but are not limited to, data discrepancies, procedural and/or documentation deficiencies, or material defects. Also, the title(s) of the individual(s) involved in this process shall be included.

p) Exhibits

Forms used in the quality system shall be included in the manual with a written description. Forms exhibited should be marked SAMPLE and completed in a manner typical of actual valve repair procedures.

q) Testing Equipment (See NBIC Part 3, Supplement 8)

The system shall include a means to control the development, addition, or modification of testing equipment to ensure the requirements of NBIC Part 3, 4.5.1(b) are met.

r) Field Repairs (See NBIC Part 3, S7.7)

If field repairs are included in the scope of work, the system shall address any differences or additions to the quality system required to properly control this activity, including the following:

1) Provisions for annual audits of field activities shall be included;

2) Provisions for receipt and inspection of replacement parts, including parts received from the owner-user, shall be addressed;

3) If owner-user personnel will assist with repairs, provisions for the use of owner-user personnel shall be included; and

4) Provisions for use of owner-user measurement and test equipment, if applicable, shall be addressed.

1.8 "NR" PROGRAM REQUIREMENTS

1.8.1 SCOPE

Minimum Liquid Temperature for Pressure Testing (deg C)	Thickness (mm) of Pressure Retaining Object (Note1) t
43	t > 100
Note (1) Thickest section of the pressure retaining object.	

6) Hold-time for the pressure test shall be a minimum of 10 minutes prior to examination by the Inspector. Where the test pressure exceeds the MAWP of the item, the test pressure shall be reduced to the MAWP for close examination by the Inspector. Hold-time for close examination shall be as necessary for the Inspector to conduct the examination.

b) Pneumatic Test

A pneumatic test may be conducted when contamination of the pressure-retaining item by liquids is possible or when liquid pressure testing is not practicable. Concurrence of the owner shall be obtained in addition to the Inspector and Jurisdiction where required. Pneumatic test requirements and precautions shall be in accordance with the original code of construction.

c) Nondestructive Examination

NDE may be conducted when contamination of the pressure-retaining item by liquids is possible or when pressure testing is not practicable. Concurrence of the owner shall be obtained in addition to the Inspector, and where required, the Jurisdiction. Exclusive use of Visual Examination (VT) shall not be permitted. In all cases NDE methods or combination of methods used shall be suitable for providing meaningful results to verify the integrity of the alteration.

4.5 PRESSURE RELIEF VALVE PERFORMANCE TESTING AND TESTING EQUIPMENT

Each pressure relief valve to which the “VR” repair symbol stamp is to be applied shall be subjected to the following tests by the repair certificate holder.

4.5.1 TEST MEDIUM AND TESTING EQUIPMENT

Valves marked for steam service, or having special internal parts for steam service, shall be tested on steam. Valves marked for air, gas, or vapor service shall be tested with air or gas. Valves marked for liquid service shall be tested with water or other suitable liquid. ASME Code, Section IV hot-water valves, shall be tested on water, steam, or air.

a) Each valve shall be tested to demonstrate the following:

1) Set pressure (as defined by the valve manufacturer and as listed in NB-18, *Pressure Relief Device Certifications*);

2) Response to blowdown, when required by the original code of construction;

3) Seat tightness; and

4) For valves designed to discharge to a closed system, the tightness of the secondary pressure zone shall be tested as required by the original code of construction.

b) The equipment used for the performance testing prescribed above shall meet the following requirements:

1) The performance testing equipment shall include a pressure vessel of adequate volume and pressure source capacity to ensure compliance with NBIC Part 3, 4.5.1 a)1);

2) Prior to use, all performance testing equipment shall be qualified by the certificate holder to ensure that the equipment and testing procedures will provide accurate results when used within the ranges established for that equipment. This qualification may be accomplished by benchmark testing, comparisons to equipment used for verification testing as specified in the quality system, or comparisons to field performance. This qualification shall be documented and provisions made to retain such documentation for a period of at least five years after the testing equipment is retired. Documentation of this qualification shall include, but not be limited to:

a. Schematic of the performance test equipment;

b. Size and pressure ranges of valves to be tested and the test fluid to be used;

c. Dimensions of test vessels;

d. Accuracy of pressure measuring equipment;

e. Size and design type of valves used to control flow; and

f. Method of qualifying.

3) Prior to the implementation of any addition or modification to the testing equipment that would alter the contents of the document required in NBIC Part 3, 4.5.1(b)(2), the certificate holder shall re-qualify the performance test equipment in accordance with NBIC Part 3, 4.5.1(b)(2). If the equipment changed was used to satisfy the requirements of verification testing, the certificate holder shall notify the National Board and additional verification testing, in accordance with the quality system, may be required.

4.5.2 OWNER-USER ASME CODE SECTION VIII STEAM TESTING

When ASME Code Section VIII valves are repaired by the owner for the owner's own use, valves for steam service may be tested on air for set pressure and, if possible, blowdown adjustment, provided the valve manufacturer's corrections for differential in set pressure between steam and air are applied to the set pressure.

4.5.3 LIFT ASSIST TESTING

a) A device may be used to apply an auxiliary lifting load on the spring of a repaired valve to establish the set pressure in lieu of the tests required in NBIC Part 3, 4.5.1a) 1) when such testing at full pressure:

1) may cause damage to the valve being tested; or

2) is impractical when system design considerations preclude testing at full pressure.

b) While actual valve blowdown and valve performance characteristics cannot be verified, valve set pressure may be determined to an acceptable degree of accuracy using this testing technique provided, as a minimum, that:

1) equipment utilized is calibrated as required in the quality system; including, but not limited to:

a. System pressure measurement equipment;

b. Lifting force measurement equipment; and

c. Other measuring elements required by the device manufacturer.

2) the device and test procedures that have proved to give accurate results are used and followed;

3) a static inlet pressure is applied with the test medium specified in NBIC Part 3, 4.5.1; and

4) adjustments are made in accordance with the valve manufacturer's recommendations to ensure proper lift and blowdown.

c) Prior to use, all lift assist devices shall be qualified by the certificate holder to ensure that the equipment and testing procedures will provide accurate results when used within the ranges established for that equipment used for verification testing as specified in the quality system or comparisons to field performance. This qualification shall be documented and provisions made to retain such documentation for a period of at least five years after the lift assist device is retired. Documentation of this qualification shall include but not be limited to:

1) A description of the lift assist device including model number, serial number and manufacturer

2) Size and pressure ranges of valves to be tested with the lift assist device and the test fluid to be used. Note: Maximum set pressure is determined by available lift force and system pressure.

3) Accuracy of pressure measuring equipment;

4) Method of qualifying.

d) After initial qualification of the device the device shall be re-qualified if:

1) Modifications or repairs to the device are made Which would affect test results

2) The manufacturer issues a mandatory recall or modification to the device which will affect test results.

4.5.4 PRESSURE TEST OF PARTS

a) Parts used in repaired valves shall be pressure tested and documentation provided according to the following categories:

1) Replacement Parts
The "VR" Certificate Holder is responsible for documentation that the appropriate pressure test has been completed as required by the original code of construction.

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.

5.3.3 LOCATION

Pressure relief devices, except those covered by Sections 2 and 3 of this Part, may be installed at any location in the system provided the pressure in any portion of the system cannot exceed the maximum overpressure permitted by the original code of construction. Pressure drop to the pressure relief device under flowing conditions shall be considered when determining pressure relief device location. The pressure-relief device shall not be isolated from the piping system except as permitted by NBIC Part 1, 5.3.6 e).

5.3.4 CAPACITY

a) The pressure relief device(s) shall have sufficient capacity to ensure that the piping is not exposed to pressures greater than that specified in the original code of construction.

b) When a non-reclosing device is installed between a pressure relief valve and the pipe, the reduction in capacity due to installation of the non-reclosing device shall be determined in accordance with the code of construction by use of a National Board certified Combination Capacity Factor (CCF). For rupture disks, if a certified combination capacity factor is not available, the capacity of the pressure relief valve shall be multiplied by 0.9 and this value used as the capacity of the combination installation.

c) The owner shall document the basis for selection of the pressure relief devices used, including capacity, and have such calculations available for review by the Jurisdiction, when required.

5.3.5 SET PRESSURE

a) When a single pressure relief device is used, the set pressure marked on the device shall not exceed the maximum allowable working pressure, except when allowed by the original code of construction.

b) When more than one pressure relief device is provided to obtain the required capacity, only one pressure relief device set pressure needs to be at the maximum allowable working pressure. The set pressures of the additional pressure relief devices shall be such that the pressure cannot exceed the overpressure permitted by the code of construction.

overpressure of piping systems.

2.4.8.3 QUICK-DISCONNECT COUPLING

Piping connections utilizing a quick-disconnect coupling should be checked to ensure that the coupling and its holding elements are fully engaged in their intended operating position. Means should be provided that warn the operator against disengaging the coupling or prevent the opening mechanism from operating unless the piping is completely depressurized.

2.5 PRESSURE RELIEF DEVICES

2.5.1 SCOPE

a) The most important appurtenances on any pressurized system are the pressure relief devices provided for overpressure protection of that system. These are devices such as safety valves, safety relief valves, pilot valves, and rupture disks or other non-reclosing devices that are called upon to operate and reduce an overpressure condition.

b) These devices are not designed or intended to control the pressure in the system during normal operation. Instead, they are intended to function when normal operating controls fail or abnormal system conditions are encountered.

c) Periodic inspection and maintenance of these important safety devices is critical to ensure their continued functioning and availability when called upon to operate. See NBIC Part 2, 2.5.8 for recommended testing frequency for PRDs.

d) Inspection areas of concern include:

   1) correct set pressure;

   2) safety considerations;

   3) device data;

   4) condition of the device;

   5) condition of the installation; and

   6) testing and operational inspection.

2.5.2 PRESSURE RELIEF DEVICE DATA

a) Nameplate marking or stamping of the device should be compared to stamping on the protected pressure-retaining item. For a single device, the set pressure shall be no higher than the maximum allowable working pressure (MAWP) marked on the protected pressure-retaining item or system.

b) If multiple devices are provided, the difference between set pressures shall not exceed that permitted by the original code of construction. The set pressure of additional devices may exceed the MAWP, as permit-

ted by the original Code of Construction.

c) Verify nameplate capacity and, if possible, compare to system capacity requirements.

d) Check identification on seals and ensure they match nameplates or other identification (repair or reset nameplate) on the valve or device.

2.5.3 INSERVICE INSPECTION REQUIREMENTS FOR PRESSURE RELIEF DEVICE CONDITIONS

a) Check for evidence that the valve or device is leaking or not sealing properly. Evidence of leakage through pressure-relief valves may indicate that the system is being operated at a pressure that is too close to the valve's set pressure. See NBIC Part 2, Supplement 8.

b) Seals for adjustments should be intact and show no evidence of tampering.

c) Connecting bolting should be tight and all bolts intact.

d) The valve or device should be examined for deposits or material buildup.

e) Evidence of rust or corrosion should be checked.

f) Check for damaged or misapplied parts.

g) If a drain hole is visible, ensure it is not clogged with debris or deposits.

h) Check for test gages left in place after pressure testing of the unit.

i) Bellows valves shall be checked to ensure the bonnet vent is open or piped to a safe location. The vent shall not be plugged since this will cause the valve set pressure to be high if the bellows develops a leak. Leakage noted from the vent indicates the bellows is damaged and will no longer protect the valve from the effects of back pressure.

2.5.4 INSERVICE INSPECTION REQUIREMENTS FOR PRESSURE RELIEF DEVICE INSTALLATION CONDITION

a) Inspect inlet piping and ensure it meets the requirements of the original code of Conctruction. For pressure relief valves, check that the inlet pipe size is not smaller than the device inlet size.

b) Inspect discharge piping and ensure it meets the original code of construction. Check that the discharge pipe size is not smaller than the device outlet size.

c) Check that the valve drain piping is open.

d) Check drainage of discharge piping.

e) Check that inlet and discharge piping are not binding or placing excessive stress on the valve body, which can lead to distortion of the valve body and leakage or malfunction.

f) Check the condition and adequacy of piping supports. Discharge piping should be supported independent

3) Pressure tests should be performed prior to bringing the boiler down for planned internal inspection so needed repairs or adjustments can be made while the boiler is down.

b) High-temperature hot-water boilers

Pressure test annually to verify nameplate set pressure or as determined by operating experience as verified by testing history. For safety reasons, removal and testing on a steam test bench is recommended. Such testing will avoid damaging the safety valve by discharge of a steam-water mixture, which could occur if the valve is tested in place.

c) Low-pressure steam heating boilers

Manual check quarterly; pressure test annually prior to steam heating season to verify nameplate set pressure.

d) Hot-water heating boilers

Manual check quarterly; pressure test annually prior to heating season to verify nameplate set pressure.

Note: The frequencies specified for the testing of pressure relief valves on boilers is primarily based on differences between high pressure boilers that are continuously manned, and lower pressure automatically controlled boilers that are not monitored by a boiler operator at all times. When any boiler experiences an overpressure condition such that the safety or safety relief valves actuate, the valves should be inspected for seat leakage and other damage as soon as possible and any deficiencies corrected.

e) Water heaters

Manual check every two months. Due to the relatively low cost of safety valves for this service, it is recommended that a defective valve be replaced with a new valve if a repair or resetting is indicated.

f) Pressure vessels and piping

Frequency of test and inspection of pressure relief devices for pressure vessel and piping service is greatly dependent on the nature of the contents and operation of the system and only general recommendations can be given. Inspection frequency should be based on previous inspection history. If valves are found to be defective or damaged by system contents during inspection, intervals should be shortened until acceptable inspection results are obtained. Where test records and/or inspection history are not available, the inspection frequencies in Table 2.5.8 are suggested.

Service	**Inspection Frequency**
Steam	Annual
Air and clean Dry gases	Every three years
Pressure relief valves in combination with rupture disks	Every five years
Propane, refrigerant	Every five years
All others	Per inspection history

g) Establishment of inspection and test intervals

Where a recommended test frequency is not listed, the valve user and Inspector must determine and agree

NBIC – ASME Liaison Report

- Separation of Conformity Assessment Requirements
  - Establish uniform conformity assessment requirements
  - CA-1 - 2013 Standard published; 2015 edition to expand coverage
  - Adoption by Book sections in process; approved by Sections I, IV, and X
- BPV Parts Fabrication Certificate Program
  - New “Parts” Designator for fabrication w/o design responsibility
  - Certificates to apply across Code Sections
  - Approved by Sections I, IV, and XII; work continues in Section VIII
- ASME NDE Personnel Certification Program
  - 3rd party central certification for NDE personnel and QC technicians, with transportable credentials
  - ANDE-1 Standard in development
  - 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”
- Proposed new ASME Section XIII, “Rules for Overpressure Protection”
- Certificate Numbers on Data Plates
- Potential certification program for ASME B31.1 Covered Piping

NBIC Agenda 01/22/15 - Item 8.a