Date Distributed:

THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

NATIONAL BOARD INSPECTION CODE COMMITTEE

MINUTES

Meeting of July 16th, 2020
Louisville, KY

These minutes are subject to approval and are for 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 NBIC Main Committee Chair Mr. Bob Wielgoszinski called the meeting to order at 8:00 AM local time.

2. **Introduction of Members and Visitors**

Mr. Wielgoszinski suggested skipping the traditional introduction due to the mix of attendees being in-person and on WebEx.

3. **Check for a Quorum**

Mr. Wielgoszinski asked Mr. Jonathan Ellis to perform a roll call to determine which Committee members were present.

- Mr. Wielgoszinski, Ms. Marianne Brodeur, Mr. Jim Getter, Mr. Venus Newton, Mr. Mike Richards, and Mr. Marty Toth were present in-person. Mr. Matt Sansone and Mr. Tim McBee were present in-person as alternates for Mr. Rick Sturm and Mr. Paul Welch, respectively.
- Mr. Randy Austin, Mr. Paul Edwards, Mr. Craig Hopkins, Mr. Donnie LeSage, Mr. Brian Morelock, Mr. Thakor Patel, Mr. Jim Sekely, Mr. Rob Troutt, Ms. Melissa Wadkinson, and Mr. Milton Washington were present on WebEx.

All nineteen Main Committee members were present for the meeting, establishing a quorum.

A full list of meeting attendees can be found on Attachment Pages 1 and 2.

4. **Awards/Special Recognition**

Mr. Paul Edwards – 25 Years on Main Committee
Mr. Brian Morelock – 5 Years on Main Committee
Mr. Rob Troutt – 5 Years on Main Committee

Mr. Wielgoszinski congratulated Mr. Edwards, Mr. Morelock, and Mr. Troutt for their years of work on the Main Committee. Their physical awards will be presented to them at the next meeting which they attend in-person.

5. **Announcements**

This is the last meeting at which items can be approved for inclusion in the 2021 NBIC. A publication schedule for the 2021edition of the NBIC can be found on Attachment Page 3.

Mr. Wielgoszinski announced the order of business for the meeting. Starting with the Subcommittee Pressure Relief Devices report, each subcommittee would present proposals to be considered for voice vote. Once each committee has presented those proposals, interpretation requests would be addressed. Finally, each subcommittee would provide progress reports on items that still have proposals in development. Voting on membership appointments and reappointments would be held in executive session after the subcommittee and liaison reports.

For voting procedure, Mr. Wielgoszinski announced that he would be calling for disapproval/abstention/Not Voting votes to avoid members talking over each other. If there is a close vote, Mr. Ellis will take a roll call vote, asking each individual member to state their vote.

Mr. Wielgoszinski asked for those on WebEx to use the "Raise Hand" function when they would like to speak, and to keep themselves muted unless called upon or stating their vote.

6. Adoption of the Agenda

A motion was made and seconded to adopt the meeting agenda as presented. Mr. Wielgoszinski called for any additions or changes that should be made before a final vote is taken.

Ms. Marianne Brodeur requested that Mr. Prakash Dhobi be added for consideration to become a member of Subcommittee PRD, and for item 20-19 to be reclassified as an action item.

Ms. Melissa Wadkinson requested that a new action item, 20-50, be added to the agenda. She also announced that Mr. Eddie Wiggins was nominated by Subcommittee Installation to be the new Vice Chair of that subcommittee.

Mr. Jim Getter requested the addition of Mr. Brent Ray to the list of new subcommittee appointments.

Mr. Rob Troutt requested that Mr. Trevor Seime and Mr. Matt Sansone be considered for membership to Main Committee. He also requested that Mr. Trevor Seime and Mr. Robert Underwood be added to the list of subcommittee appointments, for the addition of item 20-49 to the list of Subcommittee Repairs & Alterations interpretation requests, and for action items 20-47 and 20-48 be added to the agenda.

No further suggestions for changes to the agenda were made. A vote was taken, and the agenda was unanimously approved with the above changes.

7. Approval of the Minutes of the January 16th, 2020 Meeting

The minutes are available for review on the National Board website, www.nationalboard.org.

A motion was made, seconded, and unanimously approved to accept the minutes of the January 16th, 2020 meeting.

8. Review of Rosters

The following membership actions were voted on during a Main Committee executive session. This session took place after all subcommittee and liaison reports were presented.

a. Membership Nominations

Main Committee Members:

- Mr. Matt Sansone (Jurisdictional Authorities)
- Mr. Trevor Seime (Jurisdictional Authorities)

A motion and second was made to approve the appointments of Mr. Sansone and Mr. Trevor Seime to the Main Committee. Both motions were approved unanimously. Their appointments require a final approval from the Chair of the Board of Trustees.

Subcommittee Members:

- Mr. Joe Brockman (Authorized Inspection Agencies) – Subcommittee Installation
- Mr. Brent Ray (Users) – Subcommittee Inspection
- Mr. Robert Underwood (Authorized Inspection Agencies) – Subcommittee Repairs & Alterations
- Mr. Trevor Seime (Jurisdictional Authorities) – Subcommittee Repairs & Alterations
- Mr. Prakash Dhobi (National Board Certificate Holders) – Subcommittee Pressure Relief Devices

A separate motion and second was made for each individual listed above to approve their appointment to their respective subcommittee. Each motion was unanimously approved by the Main Committee. Their appointments require a final approval from the Chair of the Board of Trustees.

b. Membership Reappointments

- Mr. Jim Sekely – Main Committee
- Mr. Donnie LeSage – Subcommittee Inspection
- Mr. James Roberts – Subcommittee Inspection
- Mr. Jason Safarz – Subcommittee Inspection
- Mr. Rick Sturm – Subcommittee Repairs & Alterations
- Mr. Raymond McCaffrey – Subcommittee Pressure Relief Devices

A motion was made, seconded, and unanimously approved to reappoint the listed committee members to their respective committees.

c. Officer Positions

It was announced that Mr. Eddie Wiggins was nominated to become the Vice Chair of Subcommittee Installation. His appointment to the position is subject to the approval of the Chair of the Board of Trustees.

9. Items Approved for 2021 NBIC

See Attachment Page 3 and 4 for a full list of items approved for inclusion in the 2021 NBIC.

10. Report of Subcommittees

a. Subcommittee Pressure Relief Devices

i. Interpretations

Item Number: 20-19	NBIC Location: Part 4, 3.3.3.4 & 4.8.5.4	Attachment page 33

General Description: Purpose of NBIC Part 4, Sec. 4.8.5.4, n) 2) & 3.3.3.4, l) 2) system review

Task Group: None Assigned

Explanation of Need: There appears to be a difference of opinion among VR & T/O Certificate Holders regarding the intent of the "review of the system in order to maintain the manual current with these rules and the applicable sections of the ASME Code." If I am wrong about my interpretation, I want to know. Thank you.
NOTE: the reference to NBIC in 3.3.3.4, l) 2) at the end of the sentence should be deleted. It is held over from NB-528 and therefore superfluous.

July 2020 Meeting Action:
Ms. Brodeur announced that this item had been reclassified as an action item. Mr. Tom Beirne provided background information for the proposed changes. A motion was made, seconded, and unanimously approved to accept the proposal as presented.

ii. Action Items – Old Business

Item Number: NB12-0901	NBIC Location: Part 4	Attachment Page 4

General Description: Prepare a guide for repair of tank vents

Task Group: B. Donalson (PM), D. DeMichael, K. Simmons, K. Beise, B. Nutter, J. Little, S. Artrip

July 2020 Meeting Action: Ms. Brodeur announced that the proposal for this item would be sent out as a letter ballot to the Main Committee.

Item Number: NB14-0602B	NBIC Location: Part 2	Attachment Page 12

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

Task Group: D. Marek (PM), B. Donalson, D. DeMichael, B. Hart

July 2020 Meeting Action: Mr. Beirne explained the changes being proposed by this item. Mr. Gary Scribner clarified that the index is not part of the technical standard and does not necessarily require committee action. The Main Committee decided to go ahead and take a vote so the item could be closed out. A motion was made, seconded, and unanimously approved to accept the changes as presented.

Item Number: NB15-0108B	NBIC Location: Part 1	No Attachment

General Description: Address pressure relief devices in new supplement on high temperature hot water boilers

Task Group: D. Marek (PM), A. Renaldo , D. McHugh, B. Nutter, A. Cox, D. Schirmer

July 2020 Meeting Action: A motion was made, seconded, and unanimously approved to close this item without further action. This was done because Subgroup and Subcommittee PRD felt this item was no longer needed.

Item Number: NB15-0305	NBIC Location: Part 4	No Attachment

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

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

July 2020 Meeting Action: Ms. Brodeur reported that a proposal for this item is still in development.

Item Number: NB15-0307	NBIC Location: Part 4	No Attachment

General Description: Create Guidelines for Repair of Pin Devices.

Task Group: D. McHugh (PM), A. Renaldo, T. Tarbay, R. McCaffrey, J. Simms, C. Beair

July 2020 Meeting Action: Ms. Brodeur reported that a proposal for this item is still in development.

Item Number: NB15-0308	NBIC Location: Part 4	No Attachment

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

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

July 2020 Meeting Action: Ms. Brodeur reported that a proposal for this item is still in development.

Item Number: NB15-0315	NBIC Location: Part 4, 2.5.6 and 2.6.6 and Part 1, 4.5.6 and 5.3.6	No Attachment

General Description: Review isolation Valve Requirements, and reword to allow installation of pressure relief devices in upstream piping.

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

July 2020 Meeting Action: Ms. Brodeur reported that a proposal for this item is still in development.

Item Number: NB15-0321	NBIC Location: Part 4, 3.2.5 a) and Part 2, 2.5.7 a)	Attachment Page 13

General Description: Review testing requirements for in-service testing of pressure relief devices

Task Group: A. Cox, A. Renaldo (PM), D. Marek, S. Irvin, D. DeMichael, B. Nutter, J. Ball

July 2020 Meeting Action: Ms. Brodeur announced that the proposal for this item would be sent to the Main Committee as a letter ballot.

Item Number: 17-115	NBIC Location: Part 4, Section 2	No Attachment

General Description: Complete rewrite of Section 2 combining common requirements into a general requirements section for all pressure relief devices and look at combining with 2.4.3, 2.4.4.

Task Group: A. Renaldo (PM), D. McHugh, D. Marek

July 2020 Meeting Action: Ms. Brodeur announced that a proposal for this item would be sent to Subcommittee PRD as a letter ballot.

Item Number: 17-119	NBIC Location: Part 4, 2.2.5 and Part 1, 2.9.1.4	No Attachment

General Description: States pressure setting may exceed 10% range. Clarify by how much.

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

July 2020 Meeting Action: Ms. Brodeur reported that a proposal for this item is still in development.

Item Number: 17-128	NBIC Location: Part 4, 2.4.4.3 and Part 1, 3.9.4.3	Attachment Page 21

General Description: allows Y-base to be used while 2.4.1.6 a) prohibits. This appears to be a conflict.

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

July 2020 Meeting Action: Ms. Brodeur introduced the item and mentioned that it was approved by Subgroup and Subcommittee PRD. A motion was made and seconded to approve the proposal. Discussion was held on negative comments from a previous ballot and the project manager's response to the comments. Ms. Wadkinsion felt her letter ballot comment was resolved by the response and new proposal. Mr. Troutt mentioned that he would like to see this change happen at the same time as an AMSE Section IV item about similar topic. Mr. Scribner mentioned that the ASME BPV code doesn't cover installation, so it would be okay for the NBIC to make this change before ASME. Mr. Troutt stated that making the change at different times would affect jurisdictions due to different requirements in ASME and NBIC. A vote was held on the original motion, and the proposal was approved with one negative vote and one abstention. The reason for the negative vote was that the voter felt the restriction of y-base in the NBIC while it is allowed in ASME Section IV would create a problem with a jurisdiction that adopts the NBIC. The reason for the abstention vote was that the voter felt the conflict between ASME Section IV and the NBIC needs to be resolved to avoid confusion, and that the item should be held until ASME Section IV addresses the issue.

Item Number: 18-73	NBIC Location: Part 4, 2.3 and Part 1, S5.7.6	Attachment Page 22

General Description: Update installation requirements for Thermal Fluid Heaters

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

July 2020 Meeting Action: Ms. Brodeur and Mr. Beirne introduced the item and discussed previous ballots and comments from those ballots. It was mentioned that PRD and Installation have approved the current proposal. A motion was made and seconded to approve proposal as presented. Ms. Wadkinson talked about discussion from January Main Committee meeting, and that those point have been addressed in this proposal; both Subgroup and Subcommittee Installation are on board with this proposal. The motion to accept this proposal was unanimously approved.

Item Number: 18-80	NBIC Location: NBIC Location: Part 4, S4.1, S5.1, S6.1	Attachment Page 29

General Description: Addition of a "Scope" section to Part 4, S3.1, S4.1, and S6.1 to stay consistent with other sections

Task Group: T. Patel (PM), A. Renaldo, K. Simmons, P. Dhobi

July 2020 Meeting Action: Mr. Beirne introduced the item and discussed a negative vote from Mr. Paul Edwards regarding inconsistencies between the previous proposal and the 2019 edition of the NBIC. Mr. Beirne confirmed that Mr. Edward's comment was resolved in the new proposal. A motion was made, seconded, and unanimously approved to accept the proposal.

Item Number: 19-1	NBIC Location: Part 4, 4.8.5.4 & 4.8.6.1	No Attachment

General Description: Develop specific content and scope of annual field audits.

Task Group: A. Donaldson (PM), D. Marek, A. Cox, P. Dhobi, M. Brodeur, T. Patel

July 2020 Meeting Action: Ms. Brodeur reported that a proposal for this item is still in development.

Item Number: 19-2	NBIC Location: Part 4, 4.9.1	Attachment Page 31

General Description: Additional Training Requirements for VR and T/O programs

Task Group: A. Donaldson (PM), A. Cox, B. Donaldson, D. Marek, J. Simms

Explanation of Need: This was discussed at the July 2018 meetings and the SG and SC both agreed that we should look to expand the training program requirements. During the Development of the T/O code language in Part 4, the task group identified a lack of training requirements included in the new section. Upon further investigation, it was determined that the T/O requirements were copied directly from the V/R requirements.

July 2020 Meeting Action: Ms. Brodeur announced that the proposal for this item would be sent to the Main Committee as a letter ballot.

Item Number: 19-37	NBIC Location: Part 4, 4.3.1 c) 4)	No Attachment

General Description: Origin of Replacement Parts for Pressure Relief Devices

Task Group: A. Cox (PM), T. Patel, P. Dhobi, J. Simms

Explanation of Need: VR Holders are required to obtain a Certificate of Compliance when they purchase Replacement Critical Parts from longtime PRV Manufacturer's Representatives. This is prevalent in the Midstream Oil & Gas Sector. Several small VR Holders in this Sector of the Energy Industry have expressed their desire to make this issue less cumbersome because the Manufacturers of the majority of PRVs they repair do not have Assemblers.

July 2020 Meeting Action: Ms. Brodeur reported that a proposal for this item is still in development.

Item Number: 19-71	NBIC Location: Part 4, 4.9.2 & 4.9.3	No Attachment

General Description: Use of Personnel from another VR Certificate Holder to perform VR Repairs

Task Group: A. Donaldson (PM), A. Cox, B. Donaldson, D. Marek, J. Simms

Explanation of Need: NBIC SCPRD needs to address the practice of sub-contracted personnel between VR Holders. In order to maintain Quality Standards, the responsible VR Holder must verify the qualifications all personnel and maintain records per NBIC Part 4, Table 4.8.5.4 s)

July 2020 Meeting Action: Ms. Brodeur announced that the proposal for this item would be sent to Subgroup PRD as a letter ballot.

Item Number: 19-83	NBIC Location: Part 4, 4.7.5	No Attachment

General Description: Address Alternate Pressure Relief Valve Mounting Permitted by ASME CC2887-1

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

Explanation of Need: ASME Code Case 2887-1 permits the installation of pressure relief valves below a low mass water tube boiler or water heater under certain conditions. This set of conditions and alternate location should be addressed in the NBIC as the use of low mass water tube boilers and water heaters becomes more widespread.

July 2020 Meeting Action: Ms. Brodeur reported that a proposal for this item is still in development.

Item Number: 19-85	NBIC Location: Part 4, 2.3.6 j)	No Attachment

General Description: Thermal Fluid Heaters

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

Explanation of Need: Thermal Fluid heaters with no change of phase are not specifically addressed in 2.3.6 j).

July 2020 Meeting Action: Ms. Brodeur reported that a proposal for this item is still in development.

iii. New Items:

Item Number: 20-9	NBIC Location: Part 4, 9.1	Attachment Page 32

General Description: Define "Verify" in the NBIC Glossary

Subgroup: Repairs and Alterations

Task Group: N. Carter (PM)

Explanation of Need: Defining "Verify" in the NBIC Part 1, 2, 3, and 4 to align with the definition in NB-263, RCI-1, Rules for Commissioned Inspectors.

July 2020 Meeting Action: Ms. Brodeur introduced the item and proposal. A motion was made and seconded to approve as the proposal as presented. Mr. Wielgoszinski mentioned that this is a shared item across all four subcommittees. The definitions used in the proposal come from RCI-1, and adopting it would harmonize the language between the two standards. Mr. Jim Getter mentioned that Subgroup and Subcommittee Inspection made a few changes to account for remote inspections, since those requirements are coming to the NBIC soon. Mr. Troutt mentioned that Subgroup and Subcommittee R&A were in agreement to use the words from RCI-1. Mr. Paul Shanks mentioned that the language on remote inspections can be added later. Mr. Venus Newton stated that he was worried that there will be an issue if the NBIC has language allowing remote inspections, but the definition of “witness” does not allow for remote inspections. Mr. Wielgoszinski reiterated that the goal should be to avoid conflict between RCI-1 and NBIC, and that the definitions can be revised in stages. A vote was held on the original motion, and the proposal was approved with two negative votes. Negative votes from Venus Newton and Jim Getter, approved overall. Both of the members who disapproved the proposal voted that way because they felt that the definition is too narrow and wouldn’t allow for remote inspection techniques.

b. Subcommittee Installation

i. Interpretations

ii. Action Items – Old Business

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: R. Smith (PM), M. Richards, S. Konopacki, D. Patten and E. Wiggins

July 2020 Meeting Action: Ms. Wadkinson reported that the proposal for this item is still in development.

Item Number: 18-2	**NBIC Location: Part 1**	**Attachment Page 34**

General Description: Result of NB16-0101, add verbiage regarding commissioning fired boilers & fired pressure vessels with a calibrated combustion analyzer.

Subgroup: SG Installation

Task Group: E. Wiggins (PM), D. Patten, M. Wadkinson, and G. Halley, G. Thompkins, M. Washington

July 2020 Meeting Action: Mr. Eddie Wiggins discussed the proposal for this item as well as comments from a letter ballot for a previous version of the proposal. Mr. Marty Toth talked about the reasoning behind his letter ballot comment and expressed concerns on enforcing the proposed language. A motion was made and seconded to approve the proposal as presented. Mr. Wielgoszinski asked where this change would go; Mr. Wiggins clarified that this would be part of Part 1, 1.6.10. The proposal received unanimous approval.

Item Number: 18-57	**NBIC Location: Part 1**	**No Attachment**

General Description: address the use & definition of the word inspector

Subgroup: SG Installation

Task Group: - P. Jennings (PM), R. Smith, -, T. Creacy, R. Spiker, M. Washington, and R. Adams

July 2020 Meeting Action: Ms. Wadkinson reported that the proposal for this item is still in development.

Item Number: 19-45	NBIC Location: Part 1, S1	Attachment Page 36

General Description: Revisions to Yankee Dryer Supplement Wording in Part 1

Subgroup: SG Installation

Task Group: R. Spiker (PM), J. Jessick, and D. Patten

July 2020 Meeting Action: Mr. Ron Spiker presented the proposal for this item. A motion was made and seconded to approve the proposal as presented. Discussion was held on the materials used to make yankee dryers. Older ones were made of cast iron, while newer ones are cast steel. Mr. Adam Renaldo asked about the use of Yankee vs yankee. Mr. Scribner answered that "Yankee" is a brand, while "yankee" is the generalized term. The proposal was approved unanimously by the Main Committee.

Item Number: 19-81	NBIC Location: Part 1, Table 3.7.9.1-b	Attachment Page 37

General Description: Correction to value in TABLE 3.7.9.1-b
The table in question is generated using the equation in 3.7.9.1 a) 2). The values in the table are all based on the same temperatures and pressures. The only thing that changes is the volume. The ratio of the Non-pressurized Type column value to the System Volume is 0.15 in all cases except the 100 gallon case which ends up being 0.18. Thus multiplying any system volume by 0.15 should give the third column value.

Subgroup: SG Installation

Task Group: R. Smith (PM), M. Washington, T. Creacy, and R. Austin

Explanation of Need: There is only one incorrect value in the NBIC table and the rationale is in the background information. In addition, ASME Section IV, Table HG-709.2 has the correct value.

July 2020 Meeting Action: Mr. Rex Smith introduced the proposal for this item. A motion was made, seconded, and unanimously approved to accept the proposal as presented.

iii. Action Items – New Business

Item Number: 20-9	NBIC Location: Part 1, 9.1	Attachment Page 33

General Description: Define "Verify" in the NBIC Glossary

Subgroup: Repairs and Alterations

Task Group: N. Carter (PM)

Explanation of Need: Defining "Verify" in the NBIC Part 1, 2, 3, and 4 to align with the definition in NB-263, RCI-1, Rules for Commissioned Inspectors.

July 2020 Meeting Action: This item was addressed during the Subcommittee PRD report.

Item Number: 20-13	NBIC Location: Part 1, 3.7.9.1	Attachment Page 38

General Description: Expansion Tank Maximum Operating Pressure

Subgroup: SG Installation

Task Group: None assigned.

Explanation of Need: Table 3.7.9.1-b - 30 psig matches note (a) of Table HG-709.2 of ASME Sect IV. 3.7.9.1 a) 2) The "except for prepressurized tanks" phrase is misplaced and belongs with the provisions for draining tanks. See last sentence in HG-709.2 on p. 62 and first sentence in that same section just prior to the formulas on pg. 63.

July 2020 Meeting Action: Ms. Wadkinson introduced the proposal for this item. A motion was made, seconded, and unanimously approved to accept the proposal as presented.

Item Number: 20-27	NBIC Location: Part 1, 1.6.9 & S6.3	No Attachment

General Description: Carbon Monoxide Detector/Alarm NBIC 2019

Subgroup: SG Installation

Task Group: None assigned.

Explanation of Need: These codes are being enforced by some jurisdictions on existing installations. Inspectors need to know what codes we need to enforce. Do the detectors have specific levels of CO when an alarm is to go off? Is there a requirement for an audible alarm or decibel level of the alarm? Where in the boiler room should the alarm/monitor be mounted?

July 2020 Meeting Action: Ms. Wadkinson reported that the proposal for this item is still in development.

Item Number: 20-30	NBIC Location: Part 1	No Attachment

General Description: Review of installation requirements for Motors

Subgroup: SG Installation

Task Group: J. Brockman (PM).

Explanation of Need: Incorporation of applicable CSD-1 Requirements.

July 2020 Meeting Action: Ms. Wadkinson reported that Subgroup and Subcommittee Installation reviewed CSD-1 and felt there were no changes related to this item that needed to be made to the NBIC. A motion was made, seconded, and unanimously approved to close the item without further action.

Item Number: 20-31	NBIC Location: Part 1	No Attachment

General Description: Overcurrent Protection

Subgroup: SG Installation

Task Group: M. Washington (PM).

Explanation of Need: Incorporation of applicable CSD-1 requirements.

July 2020 Meeting Action: Ms. Wadkinson reported that Subgroup and Subcommittee Installation reviewed CSD-1 and felt there were no changes related to this item that needed to be made to the NBIC. A motion was made, seconded, and unanimously approved to close the item without further action.

Item Number: 20-32	NBIC Location: Part 1	No Attachment

General Description: Electric Boilers

Subgroup: SG Installation

Task Group: T. Creacy (PM).

Explanation of Need: Incorporation of applicable CSD-1 requirements.

July 2020 Meeting Action: Ms. Wadkinson reported that Subgroup and Subcommittee Installation reviewed CSD-1 and felt there were no changes related to this item that needed to be made to the NBIC. A motion was made, seconded, and unanimously approved to close the item without further action.

Item Number: 20-33	NBIC Location: Part 1	No Attachment

General Description: Flow or Temp Sensing Devices forced Circulation Boilers

Subgroup: SG Installation
Task Group: M. Downs (PM).

Explanation of Need: Incorporation of applicable CSD-1 requirements.

July 2020 Meeting Action: Ms. Wadkinson reported that the proposal for this item is still in development.

Item Number: 20-34	NBIC Location: Part 1	No Attachment

General Description: Venting of gas train components

Subgroup: SG Installation
Task Group: P. Jennings (PM).

Explanation of Need: Incorporation of applicable CSD-1 requirements.

July 2020 Meeting Action: Ms. Wadkinson reported that the proposal for this item is still in development.

Item Number: 20-35	NBIC Location: Part 1	No Attachment

General Description: Installation requirements for Fuel Oil Trains

Subgroup: SG Installation
Task Group: G. Tompkins (PM).

Explanation of Need: Incorporation of applicable CSD-1 requirements.

July 2020 Meeting Action: Ms. Wadkinson reported that the proposal for this item is still in development.

Item Number: 20-36	NBIC Location: Part 1	Attachment Page 39

General Description: Review Installation requirements for Bonding & Grounding

Subgroup: SG Installation

Task Group: R. Smith (PM).

Explanation of Need: Incorporation of applicable CSD-1 requirements.

July 2020 Meeting Action: Mr. Rex Smith presented a proposal for this item. He mentioned that this proposal was approved unanimously by Subgroup and Subcommittee Installation. A motion was made and seconded to approve the proposal as presented. Mr. Troutt asked if the grounding/bonding process is for the vessel itself. Mr. Smith said that it is for the system as a whole. The grounding/bonding is for electrolytic corrosion; grounding for electric shock is not in the scope of Part 1. George voiced his support the proposal. Mr. Adam Renaldo asked if the proposed language fits in Part 1, 1.6.1 or if it should be in another section. Mr. Smith confirmed that section 1.6.1 is the best location for this change. After discussion, a vote was taken to act on the motion and second to accept the proposal. This vote passed unanimously.

Item Number: 20-37	NBIC Location: Part 1	No Attachment

General Description: Electrical Requirements

Subgroup: SG Installation

Task Group: D. Patten (PM).

Explanation of Need: Incorporation of applicable CSD-1 requirements.

July 2020 Meeting Action: Ms. Wadkinson reported that Subgroup and Subcommittee Installation reviewed CSD-1 and felt there were no changes related to this item that needed to be made to the NBIC. A motion was made, seconded, and unanimously approved to close the item without further action.

Item Number: 20-38	NBIC Location: Part 1	No Attachment

General Description: General Requirements for Wiring

Subgroup: SG Installation

Task Group: R. Spiker (PM).

Explanation of Need: Incorporation of applicable CSD-1 requirements.

July 2020 Meeting Action: Ms. Wadkinson reported that Subgroup and Subcommittee Installation reviewed CSD-1 and felt there were no changes related to this item that needed to be made to the NBIC. A motion was made, seconded, and unanimously approved to close the item without further action.

Item Number: 20-39	NBIC Location: Part 1	No Attachment

General Description: Modular Boilers

Subgroup: SG Installation

Task Group: T. Clark (PM).

Explanation of Need: Incorporation of applicable CSD-1 requirements.

July 2020 Meeting Action: Ms. Wadkinson reported that the proposal for this item is still in development.

Item Number: 20-40	NBIC Location: Part 1	No Attachment

General Description: Gas Train Requirements

Subgroup: SG Installation

Task Group: R. Adams (PM).

Explanation of Need: Incorporation of applicable CSD-1 requirements.

July 2020 Meeting Action: Ms. Wadkinson reported that the proposal for this item is still in development.

Item Number: 20-41	NBIC Location: Part 1	No Attachment

General Description: Safety and Safety Relief Valves for Steam and Hot Water Heating Boilers.

Subgroup: SG Installation

Task Group: E. Wiggins (PM).

Explanation of Need: Incorporation of applicable CSD-1 requirements.

July 2020 Meeting Action: Ms. Wadkinson reported that the proposal for this item is still in development.

Item Number: 20-42	NBIC Location: Part 1	Attachment Page 40

General Description: Pressure Controls for Steam Boilers

Subgroup: SG Installation

Task Group: R. Austin (PM).
Explanation of Need: Incorporation of applicable CSD-1 requirements.

July 2020 Meeting Action: Mr. Randy Austin explained the changes being proposed for this item. He also announced that Subgroup and Subcommittee Installation unanimously approved the proposal. Mr. Venus Newton asked if this language was taken straight from CSD-1. Mr. Austin confirmed that the language was adapted from CSD-1. Mr. Marty Toth asked if NFPA-5 would apply to the scope of this item. Mr. Austin did not believe it was applicable, and the scope of this item only covered CSD-1. Ms. Wadkinson confirmed that no review of NFPA-5 has been done at this time, but it can be done in the future. A motion was made, seconded, and unanimously approved to accept the proposal as presented.

Item Number: 20-43	NBIC Location: Part 1	No Attachment

General Description: Safety Relief valve for Hot Water Supply Boilers

Subgroup: SG Installation

Task Group: W. Anderson (PM).

Explanation of Need: Incorporation of applicable CSD-1 requirements.

July 2020 Meeting Action: Ms. Wadkinson reported that the proposal for this item is still in development.

Item Number: 20-44	NBIC Location: Part 1	Attachment Page 44

General Description: CW Vacuum Boilers

Subgroup: SG Installation

Task Group: K. Watson (PM).

Explanation of Need: Incorporation of applicable CSD-1 requirements.

July 2020 Meeting Action: Mr. Ron Spiker discussed the proposal and stated that the NBIC currently has no language on vacuum boilers. A motion was made and seconded to approve as presented. Mr. Wielgoszinski and Mr. Toth asked questions about the format of the proposal, the section references, and the proposed location in Part 1 for the new language. Discussion was held on these questions, resulting in the original motion being withdrawn. Ms. Wadkinson and Mr. Spiker agreed that the proposal would be taken back for further work to address the questions and discussion.

Item Number: 20-45	NBIC Location: Part 1	Attachment Page 45

General Description: Temperature Control for Hot Water Boilers

Subgroup: SG Installation

Task Group: M. Wadkinson (PM).

Explanation of Need: Incorporation of applicable CSD-1 requirements.

July 2020 Meeting Action: Ms. Wadkinson presented the proposal for this item. She also announced that this proposal was approved unanimously by Subgroup and Subcommittee Installation. A motion was made and seconded to approve the proposal as presented. Mr. Venus Newton asked if there was any consideration for placement of sensors, Ms. Wadkinson mentioned that a placement requirement would be more of a requirement for the manufacturer, but the subcommittee could look at adding language later on if needed. Mr. Marty Toth asked if the "at least" language comes from CSD-1, and Ms. Wadkinson confirmed that it does. The motion to approve the proposal passed unanimously.

Item Number: 20-50	NBIC Location: Part 1, 2.8.2	Attachment Page 46

General Description: pressure range on pressure gage of power boilers

Subgroup: SG Installation

Task Group: M. Wadkinson (PM).

Explanation of Need: There is a discrepancy between NBIC Part 1 and ASME Section I.

July 2020 Meeting Action: Ms. Wadkinson presented the proposal for this item. She also announced that this proposal was approved unanimously by Subgroup and Subcommittee Installation. A motion was made and seconded to approve the proposal as presented. Mr. Marty Toth asked for supporting information as to why this change is being proposed. It was confirmed that this change would harmonize NBIC Part 1 with ASME Section I. No further discussion was held, and the proposal was approved unanimously.

c. Subcommittee Inspection

i. Interpretations

ii. Action Items – Old Business

Item Number: NB16-1402	**NBIC Location: Part 2, New Supplement**	**Attachment Page 47**

General Description: Life extension for high pressure FRP vessels above 20 years

Subgroup: FRP
Task Group: M. Gorman (PM)

Background:
In 2016, when this item was first opened, it was assigned as an item for Part 3. Recent discussions with SC R&A and the FRP Task Group have revealed that this item is better suited for Part 2. This item has been approved by the FRP Task Group.

Scope: The goal of this proposal is to provide a method to evaluate whether the service life of high pressure fiber reinforced plastic pressure vessels can be extended for an additional lifetime.

July 2020 Meeting Action: Mr. Jim Getter announced that the proposal for this item would be sent to Subcommittee Inspection as a letter ballot.

Item Number: 18-6	**NBIC Location: Part 2, S1.4.2.9**	**No Attachment**

General Description: Riveted stay bolt dimensions

Subgroup: Locomotive

Task Group: M. Janssen (PM)

July 2020 Meeting Action: Mr. Getter reported that a proposal for this item is still in development.

Item Number: 18-43	**NBIC Location: Part 2, Section 5**	**Attachment Page 52**

General Description: Permanent nameplate removal from pressure vessel being removed from service

Subgroup: Inspection

Task Group: J. Roberts (PM), J. Burgess, J. Calvert, , J. Clark, M. Sansone

July Meeting Action: Mr. Getter explained the changes being proposed. A motion was made and seconded to approve the proposal as presented. Mr. Getter explained that this new section is a non-mandatory section; if someone wants to use this form, this section provides guidelines to complete it. Mr. Venus Newton mentioned that this would act as a "death certificate" for a pressure vessel. Mr. Marty Toth asked if the use of "shall" in the new language would make the form mandatory. Mr. Getter said that this section would only be for owners that want to scrap their vessel. Mr. Rob Troutt asked if any changes have been made to the proposal based on letter ballot comments from the previous ballot. Mr. Getter said that no changes were made. Mr. Scribner mentioned that procedurally the comments need to be addressed before the proposal comes back for a vote. The original motion to approve the proposal was rescinded, and Mr. Getter confirmed the Subcommittee would address the letter ballot comments for the next meeting.

Item Number: 18-62	NBIC Location: Part 2, S12.5	Attachment Page 55

General Description: Remote Visual Inspection Requirements

Subgroup: Inspection

Task Group: V. Newton (PM), M. Horbaczewski, B. Wilson, J. Calvert, J. Castle, D. Graf, T. Shernisky

July 2020 Meeting Action: Mr. Newton discussed the proposal and updates made as a result of the Main Committee review and comment ballot. A motion was made and seconded to approve the proposal as presented. Mr. Troutt asked if the Jurisdiction needed to be included in line 7. Mr. Newton said that only the Inspector needed to be included for that step. Further discussion was held on including the Jurisdiction if required, and adjustments were made to the proposal to include this. After discussion was completed, a vote was held and the proposal was approved unanimously.

Item Number: 18-63	NBIC Location: Part 2	No Attachment

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

Subgroup: Inspection

Task Group: V. Scarcella(PM), J. Mangas, J. Peterson, and J. Castle

July 2020 Meeting Action: Mr. Getter reported that a proposal for this item is still in development.

Item Number: 19-6	NBIC Location: Part 2, 2.3.6.8	Attachment Page 58

General Description: PVHO 2.3.6.8 Add other types of PVHO's

Subgroup: Inspection

Task Group: D. Buechel (PM), R. Smith, D.LeSage, M. Sansone

Explanation of Need: Currently part 2 only covers medical PVHO's.

July 2020 Meeting Action: Mr. Getter explained the changes shown in the proposal. A motion was made and seconded to approve the proposal as presented. Mr. Toth asked about the intent for including the second sentence in e) 4), and asked if it should actually be line 5). Mr. Getter confirmed that this is correct, and the change was made to the proposal. Additional editorial changes were made to clean up the proposal. Mr. Paul Edwards asked about the PVHO reference to see if that is the edition they want to reference, and Mr. Getter confirmed it is the correct reference. Mr. Donnie LeSage asked if adding ASME in front of the PVHO references would help clarify the language for inspectors. Mr. Getter agreed to make that change as well. After discussion concluded, the proposal was approved unanimously.

Item Number: 19-7	NBIC Location: Part 2	Attachment Page 62

General Description: Pressure Gage Graduation

Subgroup: Inspection
Task Group: V. Newton (PM), D. Buechel, D. Rose, D. Graff, & J. Clark

Explanation of Need: This item was opened after discussion of the pressure gage for PVHO's. The SG Inspection decided they needed to look into the pressure gage graduation for other pressure retaining items beyond PVHO's.

July 2020 Meeting Action: Mr. Getter explained the changes shown in the proposal. A motion was made and seconded to approve the proposal as presented. Mr. Getter also mentioned that the proposal was approved unanimously by subgroup and subcommittee Inspection. No further discussion was held, and the proposal was approved with one abstention vote.

Item Number: 19-22	NBIC Location: Part 2, S2	Attachment Page 63

General Description: Review of MAWP on cylindrical components under external pressure.

Subgroup: SG Historical
Task Group: M. Wahl (PM), J. Amato, R. Bryce & D. Rose

Explanation of Need: From the Presentation, by Robert Bryce, the subcommittee feels this needs to be reviewed more in-depth. Continue the research and documentation on the MAWP of Return Flue Boiler. This was started with the documentation presented by Robert Bryce which is located in the NBIC cloud under January 2019 Historical Subcommittee.

July 2020 Meeting Action: Mr. Getter explained the changes shown in the proposal. A motion was made and seconded to approve the proposal as presented. Mr. Paul Edwards asked about the metrication for some of the values listed in the section. Mr. Newton mentioned that many of the historical boilers aren't metricated. Mr. Getter suggested opening a second item to look into how metric units would affect the formulas in this section. After discussion was concluded, a vote was taken and the proposal was unanimously approved.

Item Number: 19-46	NBIC Location: Part 2, S5	No Attachment

General Description: Revisions to Yankee dryer supplement in Part 2 (Scope)

Subgroup: Inspection

Task Group: V. Newton (PM), T. Barker, D. Lesage, J. Jessick

Explanation of Need: Various parts of supplement 5 do not match their counterparts in Part 1, Supplement 1.

July 2020 Meeting Action: Mr. Getter reported that the proposal for this item is still in development.

Item Number: 19-63	NBIC Location: Part 2, S5.2	No Attachment

General Description: Changes to the Yankee Dryer Supplement (ASSESSMENT OF INSTALLATION)

Subgroup: Inspection
Task Group: V. Newton (PM), T. Barker, D. Lesage, J. Jessick

Explanation of Need: Ensure that wording in Part 2, S5.2, is identical to that found in Part 1, S1.2. Note that wording will be the same, but paragraph numberings will be different.

July 2020 Meeting Action: Mr. Getter reported that the proposal for this item is still in development.

Item Number: 19-64	NBIC Location: Part 2, S5.2.1	No Attachment

General Description: Changes to the Yankee Dryer Supplement (DETERMINATION OF ALLOWABLE
OPERATING PARAMETERS)

Subgroup: Inspection
Task Group: V. Newton (PM), T. Barker, D. Lesage

Explanation of Need: Ensure that wording in Part 2, S5.2.1, is identical to that found in Part 1, S1.3. Note that wording will be the same, but paragraph numberings will be different.

July 2020 Meeting Action: Mr. Getter reported that the proposal for this item is still in development.

Item Number: 19-84	NBIC Location: Part 2, S2.10.7	No Attachment

General Description: Inspecting riveted joints for failure

Subgroup: SG Historical
Task Group: F. Johnson (PM), M. Wahl, & R. Underwood

Explanation of Need: The text covers cracks parallel to a longitudinal joint, but there is no text covering inspection of plate material around a rivet.

July 2020 Meeting Action: Mr. Getter reported that the proposal for this item is still in development.

Item Number: 19-88	NBIC Location: Part 2, 2.2.12.7 c) 2)	No Attachment

General Description: At NBIC Part II propose the following be added to Thermal Fluid Heater

Subgroup: Inspection

Task Group: assigned. Scarcella (PM), M. Sansone, T. Bolden, & M. Wadkinson

Explanation of Need: These items are essential to preventing catastrophic loss and are low cost items.

July 2020 Meeting Action: Mr. Getter reported that the proposal for this item is still in development.

Item Number: 19-89	NBIC Location: Part 2, S2.7.3.2	Attachment Page 69

General Description: Longer NDE cycle for historic boilers

Subgroup: SG Historical
Task Group: D. Rose

Explanation of Need: The National Historic Boiler Association (NHBA) of Canada is the association of Canadian historical boiler associations.
The NHBA is submitting a request for change to the National Board Subgroup, Historical Boilers, to review and extend the current NDE cycle for historical boilers that is defined in Part 2, S2.7.3.2. The duration is currently shorter than other jurisdictions.

- TSSA of Ontario, Canada enforced a 10-year cycle on ultrasonic thickness testing on historical boilers after careful review of recurring NDE results and operating logs from various historical boilers in that province.
- England is reportedly also on a 10-year cycle.

Extending the NBIC NDE cycle to 10 years would reduce costs for owners in jurisdictions where NBIC is being strictly followed. If granted the opportunity, the NHBA has data to support this request.

July 2020 Meeting Action: Mr. Getter explained the changes shown in the proposal. He also announced that the proposal was approved by Subcommittee Inspection with one negative vote, and approved unanimously by the Historical Task Group. Mr Trevor Seime added additional clarification on the necessity for this change. Mr. Toth asked about the intervals and how the UT results affect the intervals. Mr. Wielgoszinski asked about what is meant by continued records. Mr. Seime said that operating records would be a better term to use. Mr. George Galanes asked about adding some clarifying language to state that it is only one cycle they can skip. Mr. Seime mentioned that it is up to the Jurisdiction to decide. After discussion concluded, a vote was held and the proposal was unanimously approved.

iii. New Items:

Item Number: 20-5	NBIC Location: Part 2, 4.1 – 4.4	No Attachment

General Description: Add language in NBIC Pt2/Pt3 to minimize CSEs by allowing remote NDE.

Subgroup: Inspection

Task Group: V. Newton (PM), J. Morgan, M. Horbaczewski, D. Graf, D. LeSage, D. Rose

Explanation of Need: In order to minimize higher-risk work, specifically Confined Space Entries, remote NDE methodologies should be specifically allowed by the NBIC, at the discretion of the people performing the inspections.

July 2020 Meeting Action: Mr. Getter reported that the proposal for this item is still in development.

Item Number: 20-9	NBIC Location: Part 2, 9.1	Attachment Page 33

General Description: Define "Verify" in the NBIC Glossary

Subgroup: Repairs and Alterations

Task Group: N. Carter (PM)

Explanation of Need: Defining "Verify" in the NBIC Part 1, 2, 3, and 4 to align with the definition in NB-263, RCI-1, Rules for Commissioned Inspectors.

July 2020 Meeting Action: This item was discussed during the Subcommittee PRD report.

Item Number: 20-26	NBIC Location: Part 2, S2	No Attachment

General Description: Concern for Historical Boiler Inspections Nationwide

Subgroup: Inspection

Task Group: T. Dillon (PM), R. Underwood, L. Moedinger, M. Wahl, D. Rupert, & J. Wolf

Explanation of Need: Currently Jurisdictions are not uniform in adoption of how and when inspections are performed.

July 2020 Meeting Action: Mr. Getter reported that the proposal for this item is still in development.

Item Number: 20-46	NBIC Location: Part 2, 5.3.2	No Attachment

General Description: Updates to Forms NB-5, NB-6, & NB-7

Subgroup: Inspection

Task Group: D. Buechel (PM), M. Sansone, V. Scarcella

Explanation of Need: On the current forms NB-5, NB-6, & NB-7 there are fields that are already on the ASME Manufactures Data Report making them repetitive. Other fields that ask for in- depth technical information would be hard if not impossible for an inspector to determine and are irrelevant to the inspection process.

July 2020 Meeting Action: Mr. Getter reported that the proposal for this item is still in development.

d. Subcommittee Repairs & Alterations

i. Interpretations

Item Number: 19-26	NBIC Location: Part 3, 3.3.2	Attachment Page 70

General Description: Clarification on welding repairs on appendages

Subgroup: Repairs and Alterations
Task Group: P. Shanks (PM)

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

July 2020 Meeting Action: Mr. Rob Troutt introduced the item. A motion was made and seconded to close the item and send a letter to the inquirer saying that the subject of this interpretation request is outside the scope of NBIC. No further discussion was held, and the motion passed unanimously.

Item Number: 20-3	NBIC Location: Part 3, Section 3 & 4	Attachment Page 72

General Description: Inspector involvement in Fitness-for Service assessments

Subgroup: Repairs and Alterations

Task Group: J. Siefert (PM), N. Carter

Explanation of Need: Which Inspector (i.e. "IS" Commissioned or "R" Endorsement) signs the FFSA Form NB-403 when an "R" Certificate Holder is involved with a repair in that region as well as determine what level of review of the Fitness-for-Service the Inspector is expected to complete?

July 2020 Meeting Action: Mr. Troutt reported that work is still being done on the proposal for this item.

ii. New Interpretation Requests:

Item Number: 20-11	NBIC Location: Part 3, 3.3.3	Attachment Page 74

General Description: Scope of Repairs

Subgroup: Repairs and Alterations

Task Group: K. Moore (PM)

Explanation of Need:
NBIC Part 3 lists several examples of repair but nowhere limits the scope or amount of these examples that can be utilized when performing repairs. This creates some uncertainty when performing some types of repairs, such as replacing the tubesheets of a fixed tubesheet type heat exchanger as listed in 3.3.3 e). According to ASME BPV Code Section VIII Division 1 Part UHX, Section 13, the length of the tubes is a design parameter and therefore replacing the tubesheet in accordance with its original design might require the replacement of the tubes as well to maintain the original design length.

July 2020 Meeting Action: Mr. Troutt reported that work is still being done on the proposal for this item.

Item Number: 20-14	NBIC Location: Part 3, 3.3.3 & 5.12.4.1	Attachment Page 76

General Description: Mechanical Repair with no welding

Subgroup: Repairs and Alterations

Task Group: P. Edwards (PM)

Explanation of Need:
ASME Section VIII, Division 3 Code stamped "Parts" are being replaced with new ASME Code stamped "Parts" without any documentation. The original ASME Data Report listed the original "Part" serial number and will no longer be accurate if the original "Part" is replaced.

July 2020 Meeting Action: Mr. Paul Edwards discussed the item and proposed committee interpretation. He also announced that the proposal was unanimously approved by subgroup and subcommittee R&A. A motion was made and seconded to approve the proposal as presented. Mr. Venus Newton asked if this interpretation is limited to ASME Sec. VIII, Div. 3 vessels; Mr. Edwards confirmed that the subcommittee wanted to limit the scope of the interpretation to those vessels. No further discussion was held, and the motion to approve the proposed interpretation passed unanimously.

Item Number: 20-17	NBIC Location: Part 3, 3.3.3 and 3.3.4.3	Attachment Page 78

General Description: Weld build of wasted areas with different material

Subgroup: Repairs and Alterations

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

Explanation of Need:
It is common practice to weld build the wasted area of a component with original material and then to overlap with a corrosion resistant material to prevent future wasting of the component. It would be more efficient to simply restore the wasted area with the corrosion resistant material, provided that it meets or exceeds the strength requirements of the original material.

July 2020 Meeting Action: Mr. George Galanes presented the proposal for this item, and announced that the proposal was approved by subgroup and subcommittee R&A. No further discussion was held. A motion was made, seconded, and unanimously approved to approve the proposal for this item.

Item Number: 20-21	NBIC Location: Part 3, 4.4.1 e)	Attachment Page 79

General Description: Combination of NDE methods

Subgroup: Repairs and Alterations
Task Group: M. Quisenberry (PM)

Explanation of Need:
Clarification on the intent of 4.4.1 e) 1-5 when using VT and another NDE method but on separate welds.

July 2020 Meeting Action: Mr. Troutt presented the proposal for this item, and announced that the proposal was approved by subgroup and subcommittee R&A. No further discussion was held. A motion was made, seconded, and unanimously approved to approve the proposal for this item.

Item Number: 20-23	NBIC Location: Part 3, 3.4.5.1 b)	Attachment Page 82

General Description: Alteration of ASME Section VIII Div.2 vessels

Subgroup: Repairs and Alterations

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

Explanation of Need:
Many Div.2 vessels which are in need of repair are of sufficient age whereby all of the original paperwork was paper work. Even with the best efforts such documents can become damaged or lost by the flooding event associated with the gulf coast hurricane events and or the types of refinery fires that are all too common. In a good deal of cases these vessels simply need a new B-16.5 weld neck flange or a gasket surface weld metal build up in order to allow continued leak free surface but due to some documents being unavailable the owner is left to choose between making no repair or making a repair which is not compatible with the NBIC.

July 2020 Meeting Action: Mr. Galanes presented the proposal for this item, and announced that the proposal was approved by subgroup and subcommittee R&A. No further discussion was held. A motion was made, seconded, and unanimously approved to approve the proposal for this item.

Item Number: 20-24	NBIC Location: Part 3, 3.3.5.1 a) & 3.4.5.1 a)	Attachment Page 83

General Description: Certification of repair or alteration plans

Subgroup: Repairs and Alterations
Task Group: B. Morelock (PM)

Explanation of Need:
3.4.5.1 b) allows for the UDS to be revised if a proposed alteration plan is not compatible with the original. this revised UDS must be certified by an engineer as must the Alteration plan, there currently does not appear to be a separation of the two certifying activity's which is not in the spirit of Div.2 requiring different engineers for the UDS and MDR.

July 2020 Meeting Action: Mr. Brian Morelock presented on this item. He also mentioned that he has opened an item to address adding language to the NBIC to address the subject of this interpretation request. A motion was made and seconded to send a letter to the inquirer saying that this subject is not addressed in the NBIC currently, and an action item has been opened to add language to address this question. A vote was taken, and the motion passed unanimously.

Item Number: 20-29	NBIC Location: Part 3, 3.4.4	Attachment Page 86

General Description: PV Cycles of operations change as an alteration

Subgroup: Repairs and Alterations

Task Group: P. Shanks (PM)

Explanation of Need:
Isostatic Presses in particular (but found in other pressure vessels also) are restricted by the data report to a finite number of cycles. Operators of these vessels routinely use curves to modify what is considered a cycle and extend the life of the vessel. These vessels represent a substantial risk of failure and this practice is very difficult for the inservice inspector to successfully track and audit to ensure the integrity of these vessels are maintained as this is a grey area in the current code as written.

July 2020 Meeting Action: Mr. Paul Shanks presented the proposal for this item. A motion was made and seconded to approve the proposal as presented. Mr. Venus Newton brought up that this interpretation affects life extension guidelines in Part 2 (item NB16-1402), making them an alteration. No further discussion was held. A vote was taken, and the motion passed unanimously.

Item Number: 20-49	NBIC Location: Part 3, 4.4.2 c)	Attachment Page 88

General Description: Alternative method in lieu of pressure testing in Part 3, 4.4.2

Subgroup: Repairs and Alterations

Task Group: G. Galanes (PM)

Explanation of Need:
Since contamination of pressure-retaining items by liquids is possible and pressure testing is not practicable for the huge high-pressure vessel to be modified, and NDE is not effective for the planned modification, alternative method to ensure the structural integrity is required.

July 2020 Meeting Action: Mr. Galanes presented the proposal for this item. A motion was made and seconded to approve the proposal as presented. Mr. Wielgoszinski asked a question about if FEA stands for Finite Elemental Analysis or Finite Element Analysis. It was confirmed that it is Finite Element Analysis. A few additional editorial corrections were made to the proposal. After discussion concluded, a vote was taken, and the motion was unanimously approved.

iii. Action Items – Old Business

Item Number: NB15-1405	NBIC Location: Part 3, 1.2	Attachment Page 89

General Description: Impact testing of P-11B Material

Subgroup: Repairs and Alterations
Task Group: N. Carter (PM), P. Davis, G. Galanes, P. Shanks

July 2020 Meeting Action: Mr. Galanes presented the proposal for this item. A motion was made and seconded to approve the proposal as presented. No further discussion was held, and the proposal was approved unanimously.

Item Number: NB15-2208	NBIC Location: Part 3	No Attachment

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

Subgroup: Graphite
Task Group: Greg Becherer (PM)

July 2020 Meeting Action: Mr. Troutt reported that there was no update for this item, as Graphite is still working on the item.

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

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

Subgroup: Repairs and Alterations

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

July 2020 Meeting Action: Mr. Troutt reported that work continues on the proposal for this item.

Item Number: 17-167	NBIC Location: Part 3, S3.2 d)	No Attachment

General Description: Clarify repair inspection requirements for machined only graphite parts.

Subgroup: Graphite

Task Group: Aaron Viet (PM)

July 2020 Meeting Action: Mr. Troutt reported that there was no update for this item, as Graphite is still working on the item.

Item Number: 18-94	NBIC Location: Part 3, S3.2 f), h); S3.4 a), b), c) etc.	No Attachment

General Description: G-mark Requirements for Various Repairs/Alteration to Graphite

Subgroup: Graphite

Task Group: C. Cary (PM)

July 2020 Meeting Action: Mr. Troutt reported that there was no update for this item, as Graphite is still working on the item.

Item Number: 18-100	NBIC Location: Part 3, 3.3.2	No Attachment

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

Subgroup: Repairs and Alterations

Task Group: (Marty Toth – PM), B. Schaefer, N. Carter

July 2020 Meeting Action: Mr. Troutt reported that work continues on the proposal for this item.

Item Number: 19-16	NBIC Location: Part 3, 3.3.2 e)	No Attachment

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

Subgroup: Repairs and Alterations

Task Group: T. White (PM)

July 2020 Meeting Action: Mr. Troutt reported that work continues on the proposal for this item.

Item Number: 19-60	NBIC Location: Part 3, 1.5.1	No Attachment

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

Subgroup: Repairs and Alterations

Task Group: R. Miletti (PM), K. Moore, B. Boseo, M. Toth

Explanation of Need: Part 3, 1.5.1 provides a good outline for a Quality Systems Manual. However, the remaining elements of a Quality System, outside of the one's currently being addressed in Item 19-47 and 19-4 need to be embellished to provide a more auditable description of each element.

July 2020 Meeting Action: Mr. Troutt reported that work continues on the proposal for this item.

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

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

Subgroup: Repairs and Alterations

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

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

July 2020 Meeting Action: Mr. Troutt reported that work a proposal will be sent to Subgroup and Subcommittee R&A as a letter ballot.

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

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

Subgroup: Repairs and Alterations

Task Group: B. Wielgoszinski

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

July 2020 Meeting Action: Mr. Troutt reported that work continues on the proposal for this item.

Item Number: 19-73	NBIC Location: Part 3, S3	No Attachment

General Description: Requirements for who can make hole plugging repairs on graphite blocks

Subgroup: Graphite
Task Group: C. Cary (PM), A. Viet, A. Stupica

Explanation of Need: Performing hole plugging repairs in graphite blocks is a common repair for graphite pressure vessels, but the NBIC currently has no formal requirements for this type of repair.

July 2020 Meeting Action: Mr. Troutt reported that work continues on the proposal for this item.

Item Number: 19-74	NBIC Location: Part 3, S3.3	No Attachment

General Description: Routine repair requirements for partial nozzle replacement

Subgroup: Graphite
Task Group: A. Stupica (PM), M. Bost

Explanation of Need: Currently only nozzle replacement is addressed as a routine repair. The group is planning on defining the types of partial nozzle replacements and repairs that could be defined as routine.

July 2020 Meeting Action: Mr. Troutt reported that work continues on the proposal for this item.

Item Number: 19-79	NBIC Location: Part 3, S3.5.4 h)	No Attachment

General Description: Re-word Part 3, S3.5.4 h) to clarify cementing procedure for plugs

Subgroup: Graphite

Task Group: A. Stupica (PM)

Explanation of Need: Existing language includes unnecessary steps and is clunky to read. Text will be reworded to clarify the full procedure.

July 2020 Meeting Action: Mr. Troutt reported that work continues on the proposal for this item.

Item Number: 19-82	NBIC Location: Part 3, 1.5.1 j)	No Attachment

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

Subgroup: Repairs and Alterations

Task Group: None assigned.

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

July 2020 Meeting Action: Mr. Troutt reported that work continues on the proposal for this item.

iv. New Items:

Item Number: 20-6	NBIC Location: Part 3, Table 2.3	Attachment Page 91

General Description: Table 2.3 SWPS - Previous Versions accepted

Subgroup: Repairs and Alterations

Task Group: J. Sekely (PM)

Explanation of Need: The use of previous versions of the Designated SWPS is permitted. Previous versions include those reaffirmed, revised, or amended SWPSs regardless of publication date. The AWS reaffirms, amends or revises SWPSs in accordance with ANSI procedures. This Code addition will simplify the maintenance of Table 2.3.

Update: This item is currently being balloted to SC R&A for approval, and to Main Committee for Review and Comment.

July 2020 Meeting Action: Mr. Toutt introduced the item and mentioned that a few extra SWPSs were added to the proposal at the subgroup meeting. Both subgroup and subcommittee R&A approved the modified proposal unanimously. A motion was made, seconded, and unanimously approved to accept the proposal as presented.

Item Number: 20-7	NBIC Location: Part 3, 3.3.2 a)	Attachment Page 98

General Description: Routine repairs of Div.2 & or Div.3 vessels

Subgroup: Repairs and Alterations

Task Group: N. Carter (PM)

Explanation of Need: An interpretation is scheduled to be issued under item number 19-26 asserting that Routine repairs are not to be used on Div.2 or Div.3 vessels. rather than require review of an interpretation which may expire in two years the body of the code should make it clear that Routine repairs are not compatible with div.2 or div.3 vessels.

July 2020 Meeting Action: Mr. Toutt introduced the item and mentioned that a few extra SWPSs were added to the proposal at the subgroup meeting. Both subgroup and subcommittee R&A approved the modified proposal unanimously. A motion was made, seconded, and unanimously approved to accept the proposal as presented.

Item Number: 20-8	NBIC Location: Part 3, 8.1 b)	No Attachment

General Description: Interpretation revision process

Subgroup: Repairs and Alterations

Task Group: K. Moore (PM)

Explanation of Need: Adding language to specify that interpretations of previous NBIC editions are applicable to the most current edition, as long as code requirements have not changed.

July 2020 Meeting Action: Mr. Troutt reported that there will be a proposal to close this item once the 2021 Edition has been published with an updated Introduction that includes the proposed language.

Item Number: 20-9	NBIC Location: Part 3, 9.1	Attachment Page 99

General Description: Define "Verify" in the NBIC Glossary

Subgroup: Repairs and Alterations

Task Group: N. Carter (PM)

Explanation of Need: Defining "Verify" in the NBIC Part 1, 2, 3, and 4 to align with the definition in NB-263, RCI-1, Rules for Commissioned Inspectors.

July 2020 Meeting Action: This item was discussed during the Subcommittee PRD report.

Item Number: 20-10	NBIC Location: Part 3, New Supplement	Attachment Page 100

General Description: Develop a new Supplement to address rules and roles for FFS

Subgroup: Repairs and Alterations

Task Group: J. Siefert (PM)

Explanation of Need: Currently, the NBIC 3.3.4.8 provides for fitness for service for defects left in a pressure retaining item. It is proposed to develop a new Supplement to provide guidance in how to conduct FFS and roles and responsibilities unique to Part 3 concerning defects.

The current FFS form resides in Part 2 and can deal with in-service condition assessment and is loosely tied to defects in Part 3.

July 2020 Meeting Action: Mr. Galanes presented the proposal. A motion was made and seconded to approve the proposal as presented. Mr. Newton asked about who is supposed to sign the NB-403. Mr. Wielgoszinski clarified that it is a Part 2 function that will be signed off by a Part 3 Inspector. Mr. Troutt mentioned that the requirement to include Form NB-403 was included to specify who is needed to sign off on it for FFSA. It was suggested that Subcommittee Inspection open an item to look at the specificity of the requirements. Mr. Wielgoszinski and Mr. Newton mentioned that the Inspector completing the Form NB-403 could make that Inspector liable for the entire vessel. Further discussion was held on the topic of liability. A vote was taken, and the motion passed with one negative vote and two abstentions. The negative vote was for the issue of liability for the Inspector that signs the NB-403 form. The two members who abstained had similar concerns.

Item Number: 20-15	NBIC Location: Part 3, 3.3.2 & 5.7.2	Attachment Page 103

General Description: Stamping requirements for routine repairs

Subgroup: Repairs and Alterations

Task Group: R. Troutt (PM), K. Moore

Explanation of Need: This would offer traceability to the R-Stamp holder responsible for the work.

July 2020 Meeting Action: Mr. Toutt reported that a proposal for this item would be sent to subgroup and subcommittee R&A as a letter ballot.

Item Number: 20-16	NBIC Location: Part 3, 3.4.4	No Attachment

General Description: Rules to address re-cold stretching of vessels built to Appendix 44 rules

Subgroup: Repairs and Alterations

Task Group: None assigned.

Explanation of Need: ASME Section VIII Div.1 Mandatory Appendix 44 paragraph 44-6.2(g) clearly sets out that a vessel built to those rules needs to be re-stretch having had repair welding. it is not clear if ASME are referring to in process (at the original manufactures location) repairs or post construction repairs. However as the NBIC is currently silent this potential issue should be addressed.

July 2020 Meeting Action: Mr. Troutt reported that work continues on the proposal for this item.

Item Number: 20-20	NBIC Location: Part 3, 3.2.2 e)	No Attachment

General Description: Revision to Part 3, 3.2.2 e)

Subgroup: Repairs and Alterations

Task Group: None assigned.

Explanation of Need: The certificate holder should not have to explain or justify why a part was not pressure tested in the manufacturing stage. PG-106.8 of Section I allows the part to be fabricated and shipped as such therefore no explanation should be required.

July 2020 Meeting Action: Mr. Troutt reported that work continues on the proposal for this item.

Item Number: 20-25	NBIC Location: Part 3, S2.13	No Attachment

General Description: Repair Procedure for Fire Boxes

Subgroup: SG Historical

Task Group: M. Wahl (PM), Robin Forbes, T. Dillon, & F. Johnson

Explanation of Need: In NBIC Part 3, S2.13.10.3, S2.13.11 do not define what to do at a riveted joint. On the tubesheet, or firedoor sheet, where it is flanged to rivet to the firebox, the repairs are silent on what to do at the riveted joint.

July 2020 Meeting Action: Mr. Troutt reported that work continues on the proposal for this item.

Item Number: 20-28	NBIC Location: Part 3, 2.2.1	Attachment Page 105

General Description: Qualification of welding procedures by multiple organizations.

Subgroup: Repairs and Alterations
Task Group: None assigned.

Explanation of Need: The attached Section IX proposal has been approved for publication by the ASME board. While Section IX provides basis for these tests, it also requires that the ruling Code of Construction expressly permits this activity.

July 2020 Meeting Action: Mr. Troutt introduced the item and discussed a few dissenting votes from the subgroup and subcommittee R&A meetings. A motion was made and seconded to approve the proposal as presented. Ms. Kathy Moore mentioned that ASME has not approved language for this subject yet, and that approving this language before ASME could be premature. Mr. Phil Gilston provided background info on this proposal, as he helped put it together. Discussion was held on ASME actions for a similar item, and that this change will be in their 2021 code book. Mr. Galanes voiced his support for this change. Additional discussion was held on WPSs and PQRs. After discussion concluded, a vote was held. The proposal was approved with one abstention. The abstaining vote was given because the committee member felt that the language in the proposal should be approved only after ASME had officially approved their similar code change.

Item Number: 20-47	NBIC Location: All Parts, 9.1	No Attachment

General Description: Revision of the definition of ANIA in Section 9 of all Parts

Subgroup: Repairs and Alterations

Task Group: R. Spuhl (PM).

Explanation of Need: ANIA can be revised to clarify requirements and activities of AIA's performing NR inspection activities. After discussion of ANI endorsement requirements per Item 19-68, a revision of "ANIA" is being considered as a way to provide clarity on the ANI and ANIA requirements.

July 2020 Meeting Action: Mr. Troutt reported that work continues on a proposal for this item.

Item Number: 20-48	NBIC Location: Part 3, 1.6	No Attachment

General Description: Compare 2015 NQA-1 revision to NR program (1.6) for consistency.

Subgroup: Repairs and Alterations

Task Group: B. Wielgoszinski (PM).

Explanation of Need: Latest NQA-1 revision to be compared to NR program (1.6) for consistency.

July 2020 Meeting Action: Mr. Troutt reported that work continues on a proposal for this item.

11. Liaison Activities

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

i. Mr. Paul Edwards presented his report to the committee. The full report can be found on Attachment Page 106.

b) American Welding Society (AWS)

i. Mr. Jim Sekely presented his report to the committee. The full report can be found on Attachment Page 111.

12. Future Meetings

- January 11th -14th, 2021 – San Antonio, TX at the Sheraton Gunter Hotel
- July 12th-15th, 2021 – Cincinnati, OH at The Hilton Netherlands Hotel

13. Adjournment

Mr. Wielgoszinski thanked the committee members and National Board staff for their hard work during the week's meetings. He then adjourned the meeting at 3:30 PM local time.

Respectfully submitted,

Jonathan Ellis

Jonathan Ellis
NBIC Secretary

NBIC Main Committee Member Attendance - 7/16/2020				
First Last	**Email**	**Company**	**Phone #**	**Signature**
Brian Morelock	morelock@eastman.com	Eastman Chemical Company	423 229-1205	Webex
Craig Hopkins	chopkins@seattleboiler.com	Seattle Boiler Works	206 762-0737	Webex
Donnie LeSage	Donnie.LeSage@LA.gov	State of Louisiana	225 925-4572	Webex
George Galanes	ggalanes@diamondtechnicalservices.com	Diamond Technical Services	815 634-2727	Webex
H. Michael Richards	Hmichaelrichards.pe@gmail.com	Southern Co.	205 706-0748	In-Person
James Sekely	jsekely@comcast.net	Consultant	412 389-5567	Webex
Jim Getter	jim.getter@worthingtonindustries.com	Worthington Industries	614 840-3087	In-Person
Randy Austin	rdaustin@lanl.gov	Los Alamos National Lab	505 667-6740	Webex
Jonathan Ellis	jellis@nationalboard.org	The National Board	614 431-3236	In-Person
Marianne Brodeur	Marianne@ivicorp.net	International Valve	413 736-3682	In-Person
Marty Toth	mtoth@boiscotraininggroup.com	ECS Consulting	615 504-9064	In-Person
Melissa Wadkinson	Melissa.wadkinson@fulton-management.com	Fulton	315 298-7112	Webex
Milton Washington	milton.washington@dol.nj.gov	State of New Jersey	609 292-2345	Webex
Paul Edwards	edwardsp4@asme.org	Stone & Webster	617 483-5315	Webex
Paul Welch	paul.welch@tuvsud.com	ARISE	470 606-4707	In-Person (Tim McBee as alternate)
Rick Sturm	rsturm@utah.gov	State of Utah	1 801 554-9600	Webex (Matt Sansone as alternate)
Robby Troutt	rob.troutt@tdlr.texas.gov	State of Texas	512 539-5720	Webex
Robert Wielgoszinski	Robert_Wielgoszinski@HSB.com	Hartford Steam Boiler	860 670-0779	In-Person
Venus Newton	venus_newton@yahoo.com	XL Insurance America	404 710-8626	In-Person
Thakor Patel	thakorpatel1@gmail.com	Curtiss Wright	330 322-8720	Webex

NBIC Main Committee Visitor Attendance - 7/16/2020				
First Last	**Email**	**Company**	**Phone #**	**Signature**
Gary Scribner	gscribner@nationalboard.org	NBBI		In-person
Luis Ponce	lponce@nationalboard.org	NBBI		In-person
Jeanne Bock	jbock@nationalboard.org	NBBI		In-person
Jodi Metzmaier	jmetzmaier@nationalboard.org	NBBI		In-person
Terrence Hellman	thellman@nationalboard.org	NBBI		In-person
Tom Beirne	tbeirne@nationalboard.org	NBBI		In-person
Paul Davis	paul.davis22@woodplc.com		412 327-7420	In-person
Trevor Seime	tsseime@nd.gov	State of North Dakota	701 220-4723	In-person
Paul Shanks	paul.shanks@onecis.com	OneCIS	832 316-4249	Webex
Chris Cantrell	Christopher.Cantrell@nebraska.gov	State of Nebraska	402 471-9471	Webex
Adam Renaldo	adam_renaldo@praxair.com	Praxair, Inc.	716 879-2928	Webex
Rex Smitth	RSmith@aiallc.org	Aithorized Inspection Associates, LLC	281 751-1150	Webex
Eddie Wiggins	Edward.Wiggins@labor.alabama.gov	State of Alabama	334 549-3201	Webex
Brent Ray	bdray@marathonpetroleum.com	Marathon	606 326-2574	Webex
Scott Chestnut	stchestnut@marathonpetroleum.com	Marathon	925 370-3335	Webex
Patricia Becker	pabecker@babcock.com	Babcock & Wilcox	330 860-2807	Webex
Bob Underwood	robert_underwood@hsb.com	HSB	618 593-6231	Webex
Brian Boseo	bmboseo@burnsmcd.com		816 601-0209	Webex
Kathy Moore	kathymoore@joemoorecompany.com	Joe Moore & Company	919 832-1665	Webex

Items Approved for 2021 NBIC

Title	Item Number	CaseStatus	Cycle	Assigned Committee
Inspection Requirements for PVHOs	18-101	MC Approved	A	Subcommittee Inspection
Additional changes to PVHO	18-61	MC Approved	A	Subcommittee Inspection
Align definition of “Brazing” with ASME Section IX and address non-metallic pre-heat requirements.	18-67	MC Approved	A	Subcommittee Repairs/Alterations
Align definition of “Brazing” with ASME Section IX and address non-metallic pre-heat requirements.	18-67	MC Approved	A	Subcommittee Repairs/Alterations
Alternative language in Part 3, 3.4.4 e) to clarify that it is the current MRRC that must be considered when	18-83	MC Approved	A	Subcommittee Repairs/Alterations
Revise NBIC Part 3, paragraphs S2.6(a) and S2.9 to change incorrect reference of “NBIC Part 3, paragraph	18-88	MC Approved	A	Subcommittee Repairs/Alterations
Revise NBIC Part 2, paragraph S2.4 to change incorrect reference of “NBIC Part 3, Section 3 Corrosion and	18-89	MC Approved	A	Subcommittee Inspection
Revise S2.7.2 of NBIC Part 3, Supplement 2 to refer to existing replacement part requirements of 3.2.2 of	18-98	MC Approved	A	Subcommittee Repairs/Alterations
Valve drain plug recommendations for shipping	NB17-0401	MC Approved	A	Subcommittee Pressure Relief Devices
Paragraph 2.5.7 a) Preface by "Unless otherwise protected,..."	17-131	MC Approved	B	Subcommittee Pressure Relief Devices
Paragraph 2.5.7 a) Preface by "Unless otherwise protected,..."	17-131	MC Approved	B	Subcommittee Pressure Relief Devices
Result of 17-147; review Part 1, 4.7 for references to hot water storage tanks	17-159	MC Approved	B	Subcommittee Installation
Remove nozzle replacement and tube replacement from graphite routine repair list	17-166	MC Approved	B	Subcommittee Repairs/Alterations
Revision to WM6 to allow for external weld metal buildup	18-12	MC Approved	B	Subcommittee Repairs/Alterations
Review installation requirements for CO2 vessels	18-26	MC Approved	B	Subcommittee Installation
Review installation requirements for CO2 vessels	18-27	MC Approved	B	Subcommittee Inspection
Remove the modular limits of BTU/Hr., 3gal for oil and 117 kW for electricity to be consistent with ASME	18-44	MC Approved	B	Subcommittee Installation
Part 2 S12 changes to address shoulds/shalls	18-79	MC Approved	B	Subcommittee Inspection
Additional subparagraph in Part 3, S1.2.8 about the use of patch bolts being in accordance with ASME	18-84	MC Approved	B	Subcommittee Repairs/Alterations
For the SWPS AWS B2.1-1-233:2006, is the root or 1st pass using GTAW-S(Short Circuiting Transfer mode)	18-85	MC Approved	B	Subcommittee Repairs/Alterations
Paragraph 1.6.3 – revise text to clarify Quality Assurance Program reqs	19-12	MC Approved	B	Subcommittee Repairs/Alterations
ASME Section VIII Division 2 Class 1/Class 2 Distinction	19-15	MC Approved	B	Subcommittee Repairs/Alterations
Additional Wording to S2.11	19-21	MC Approved	B	Subcommittee Repairs/Alterations
Supplement 6 to record the "R" number assigned to either R-1 or R-2.	19-24	MC Approved	B	Subcommittee Repairs/Alterations
Temporary ASME Nameplate removal for external inspection refurbishing.	19-30	MC Approved	B	Subcommittee Inspection
Scope of 1.1 has Redundant Statements	19-33	MC Approved	B	Subcommittee Inspection
ISO/IEC-17025 Edition referenced in NR Section of Part 3	19-43	MC Approved	B	Subcommittee Repairs/Alterations
Revising Part 3, 3.3.4.3 e) 3) l) to match rules of ASME PCC-2	19-50	MC Approved	B	Subcommittee Repairs/Alterations
NBIC safety valve requirements for boilers up to 4000lb/hr	19-51	MC Approved	B	Subcommittee Installation
Part 3, Section 4 - 4.2 a) Alternative NDE requirements	19-52	MC Approved	B	Subcommittee Repairs/Alterations
Revise S2.12 to address Historical Boiler Record Retention	19-53	MC Approved	B	Subcommittee Repairs/Alterations
Changes to the Yankee Dryer Supplement (S5.2.3)	19-65	MC Approved	B	Subcommittee Inspection
Add installation requirements for pressure vessels for human occupancy (PVHOs)	NB12-0302	MC Approved	B	Subcommittee Installation
Review 2.8.1 and 2.8.5 for potential duplication paragraphs	18-1	MC Approved	C	Subcommittee Installation
Revise Table 2.3 in Part 3 to add the listed SWPSs that were revised by the AWS B2 Committee in 2018	18-102	MC Approved	C	Subcommittee Repairs/Alterations
Flush patches in stayed and un-stayed areas of tubesheets	18-75	MC Approved	C	Subcommittee Repairs/Alterations
Review the use of "Authorized Nuclear Inspection Agency" within the NBIC	18-87	MC Approved	C	Subcommittee Pressure Relief Devices
Revision to Part 3, S1.1.4 to account for new rules for riveted construction	18-95	MC Approved	C	Subcommittee Repairs/Alterations
Clarify Definition of Authorized Nuclear Inspection Agency (ANIA)	19-11	MC Approved	C	Subcommittee Repairs/Alterations
Clarify Definition of Authorized Nuclear Inspection Agency (ANIA)	19-11	MC Approved	C	Subcommittee Repairs/Alterations
Revise Part 3, 1.6.6.2, 1.6.7.2, and 1.6.8.2 to clarify responsibilities for performing audits	19-13	MC Approved	C	Subcommittee Repairs/Alterations
Implementation of QC Manual Revisions	19-18	MC Approved	C	Subcommittee Pressure Relief Devices
Part 3 - S4.2 RTP references to "Inspector"	19-19	MC Approved	C	Subcommittee Repairs/Alterations
Fusible Plug Repair Using Half Coupling Figure	19-27	MC Approved	C	Subcommittee Repairs/Alterations
Remove NB-136 reference in Replacement of Duplicate Nameplates	19-29	MC Approved	C	Subcommittee Inspection
Part 3 - Table 2.3 - Thickness Range Corrections	19-31	MC Approved	C	Subcommittee Repairs/Alterations
Delete Supplement 3 of NBIC Part 4.	19-39	MC Approved	C	Subcommittee Pressure Relief Devices
Ensure shipping plugs for PRDs are removed during the installation process	19-49	MC Approved	C	Subcommittee Pressure Relief Devices
Ensure shipping plugs for PRDs are removed during the installation process	19-49	MC Approved	C	Subcommittee Pressure Relief Devices
Reconcile Conflict regarding Sealing Adjustments of PRVs in T/O Program	19-54	MC Approved	C	Subcommittee Pressure Relief Devices
Reconcile Conflict regarding Sealing Adjustments of PRVs in T/O Program	19-54	MC Approved	C	Subcommittee Pressure Relief Devices
Change the maximum test pressure requirement when performing alteration activities	19-55	MC Approved	C	Subcommittee Repairs/Alterations
Pressure Tests for Replacement Parts	19-59	MC Approved	C	Subcommittee Repairs/Alterations
Review verbiage in Part 3, 5.12.5.1 8) and 5.12.5.1.11)	19-69	MC Approved	C	Subcommittee Repairs/Alterations
Part 4, 2.6.3 references 2.1 through 2.2. Should be 2.2 through 2.4	19-70	MC Approved	C	Subcommittee Pressure Relief Devices
Paragraph 3.3.3.4 p) Incorrect Certificate of Authorization Reference	19-76	MC Approved	C	Subcommittee Pressure Relief Devices
NBIC Part 1, 1.4.5.1.1 Guide for installation report, items 6, 10, and 20	19-77	MC Approved	C	Subcommittee Installation
Detailed Requirements for Inservice Inspection of Cast Iron Boilers.	19-78	MC Approved	C	Subcommittee Inspection
Inspect shipping plug removal for PRDs	19-9	MC Approved	C	Subcommittee Pressure Relief Devices
Form Registration Log	19-91	MC Approved	C	Subcommittee Repairs/Alterations
Adding "Document Designation" as the second column title in Table 2.3	19-92	MC Approved	C	Subcommittee Repairs/Alterations
NBIC Forms have the wrong pages identified for reference	19-93	MC Approved	C	Subcommittee Inspection
Update NBIC Part 3, Table 2.3 (2019 Edition) adding the following listed SWPSs	20-4	MC Approved	C	Subcommittee Repairs/Alterations
Result of NB10-1201, address post installation pressure testing	NB16-0102	MC Approved	C	Subcommittee Installation
Result of NB10-1201, address post installation pressure testing	NB16-0102	MC Approved	C	Subcommittee Installation
Result of NB10-1201, address post installation pressure testing	NB16-0102	MC Approved	C	Subcommittee Installation
Result of NB10-1201, address post installation pressure testing	NB16-0102	MC Approved	C	Subcommittee Installation
Paragraph 2.4.4.3 allows Y-base to be used while 2.4.1.6 a) prohibits. This appears to be a conflict.	17-128	MC Approved	D	Subcommittee Pressure Relief Devices
Paragraph 2.4.4.3 allows Y-base to be used while 2.4.1.6 a) prohibits. This appears to be a conflict.	17-128	MC Approved	D	Subcommittee Pressure Relief Devices
Paragraph 3.2.6 can be put into tabular format.	17-132	MC Approved	D	Subcommittee Pressure Relief Devices
Paragraph 3.2.6 can be put into tabular format.	17-132	MC Approved	D	Subcommittee Pressure Relief Devices
Remove "sand" blasting and replace with "abrasive" in Part 3, S4.18.2	17-137	MC Approved	D	Subcommittee Repairs/Alterations
New Welding Method 7 for dissimilar metal welds	18-13	MC Approved	D	Subcommittee Repairs/Alterations
Commissioning of fired boilers and pressure vessels	18-2	MC Approved	D	Subcommittee Installation
Remote Inspection of Confined Space Requirements	18-62	MC Approved	D	Subcommittee Inspection
Draft rules for “used” material in repairs and/or alterations.	18-65	MC Approved	D	Subcommittee Repairs/Alterations
Move sample forms and the instructions/guides for completing Reports of Repair from Section 5 to a new	18-66	MC Approved	D	Subcommittee Repairs/Alterations
Update installation requirements for Thermal Fluid Heaters	18-73	MC Approved	D	Subcommittee Pressure Relief Devices

Update installation requirements for Thermal Fluid Heaters	18-73	MC Approved	D	Subcommittee Pressure Relief Devices
Addition of a "Scope" section to Part 4, S3.1, S4.1, and S6.1 to stay consistent with other sections	18-80	MC Approved	D	Subcommittee Pressure Relief Devices
Review of MAWP on Return Flue Boilers	19-22	MC Approved	D	Subcommittee Inspection
Move Fig. 4.7.2-b to Part 4 Supplement 6.	19-40	MC Approved	D	Subcommittee Pressure Relief Devices
Review Part 4, Paragraph 4.7.5 and simplify	19-41	MC Approved	D	Subcommittee Pressure Relief Devices
Revisions to Yankee Dryer Supplement Wording in Part 1	19-45	MC Approved	D	Subcommittee Installation
PVHO 2.3.6.8 Add other types of PVHO's	19-6	MC Approved	D	Subcommittee Inspection
Pressure Gage Graduation	19-7	MC Approved	D	Subcommittee Inspection
Documentation of Steam tested on Air Correction Factor	19-72	MC Approved	D	Subcommittee Pressure Relief Devices
Documentation of Steam tested on Air Correction Factor	19-72	MC Approved	D	Subcommittee Pressure Relief Devices
Add PRD reqs for boilers up to 4000lb/hr to Part 4; Item 19-51 added these requirements to Part 1	19-75	MC Approved	D	Subcommittee Pressure Relief Devices
Correction to value in TABLE 3.7.9.1-b	19-81	MC Approved	D	Subcommittee Installation
Longer NDE cycle for historic boilers	19-89	MC Approved	D	Subcommittee Inspection
Develop a new Supplement to address rules and roles for FFS	20-10	MC Approved	D	Subcommittee Repairs/Alterations
Expansion Tank Maximum Operating Pressure	20-13	MC Approved	D	Subcommittee Installation
Purpose of NBIC Part 4, Sec. 4.8.5.4, n) 2) & 3.3.3.4, l) 2) system review	20-19	MC Approved	D	Subcommittee Pressure Relief Devices
Purpose of NBIC Part 4, Sec. 4.8.5.4, n) 2) & 3.3.3.4, l) 2) system review	20-19	MC Approved	D	Subcommittee Pressure Relief Devices
Qualification of welding procedures by multiple organizations.	20-28	MC Approved	D	Subcommittee Repairs/Alterations
Review Installation requirements for Bonding & Grounding	20-36	MC Approved	D	Subcommittee Installation
Pressure Controls for Steam Boilers	20-42	MC Approved	D	Subcommittee Installation
Temperature Control for Hot Water Boilers	20-45	MC Approved	D	Subcommittee Installation
Pressure gage range for power boilers	20-50	MC Approved	D	Subcommittee Installation
Table 2.3 SWPS - Previous Versions accepted	20-6	MC Approved	D	Subcommittee Repairs/Alterations
Routine repairs of Div.2 & or Div.3 vessels	20-7	MC Approved	D	Subcommittee Repairs/Alterations
Define "Verify" and "Witness" in the NBIC Glossary	20-9	MC Approved	D	Subcommittee Repairs/Alterations
Improve index in Part 2 relating to pressure relief devices	NB14-0602B	MC Approved	D	Subcommittee Pressure Relief Devices
create guidelines for presure relief and pilot valve storage and shelf life	NB15-0324	MC Approved	D	Subcommittee Pressure Relief Devices
create guidelines for presure relief and pilot valve storage and shelf life	NB15-0324	MC Approved	D	Subcommittee Pressure Relief Devices
Impact testing of P-11B Material	NB15-1405	MC Approved	D	Subcommittee Repairs/Alterations
Temperature ratings for discharge piping and fittings	NB16-0805	MC Approved	D	Subcommittee Pressure Relief Devices
Temperature ratings for discharge piping and fittings	NB16-0805	MC Approved	D	Subcommittee Pressure Relief Devices
Revise and update Suppplement 10 on Inspection of CRPVs	NB16-1401	MC Approved	D	Subcommittee Inspection
Add information on repair of high pressure vessels	NB16-1403	MC Approved	D	Subcommittee Repairs/Alterations

Task Group Item NB12_0901 Repair guidelines for weight-loaded pressure/vacuum vent type pressure relief valve.

S4.1 Introduction ~~Scope~~

a) It is essential that the repair organization establish basic, specific procedures for the repair of ~~weight loaded vents~~pressure relief valves. The purpose of these recommended procedures is to provide the repair organization with guidelines for this important aspect of valve repair. It is realized that t~~t~~here are many types of valves and conditions under which they are repaired and~~,~~, ~~f~~For this reason, the specific items in these recommended procedures these recommended procedures may not apply, or they may be inadequate for each of those types or to the detailed repairs that may be required for each ~~other~~ valve.

b) Prior to removal, repair, or disassembly of a pressure relief valve ensure that all sources of pressure have been removed.

c) S4.2 contains recommended procedures for the repair of spring-loaded pressure relief valves, and S4.3 contains recommended procedures for the repair of pilot operated types of pressure relief valves, and S4.4 contains recommended procedures for the repair of weight loaded- vents. Information on packaging, shipping and transportation is included in ~~as~~ S4.5.

S4.2 SPRING-LOADED PRESSURE RELIEF VALVES (No change)

S4.3 PILOT OPERATED PRESSURE RELIEF VALVES (No change)

~~c)~~

S4.4 WEIGHT LOADED VENTS

The procedures -provided in S4.4 are general guidelines. ~~ance, and~~ T~~t~~he manufacturer's information, when available, ~~when available,~~ should be used for detailed instructions based on the vent type and design.

CAUTION: Weight loaded vents are often exposed to hazardous media. An SDS (safety data sheet) should be provided to the repair organization prior to the commencement of any work. If the vent has been exposed to hazardous media, it should be fully decontaminated prior to

inspection and disassembly. If the vent has not been fully decontaminated, safety precautions should be taken to adequately protect repair personnel.

~~a)~~

~~1)~~ External inspection

a) ~~a)~~ ~~A~~

1) All external components ~~weight loaded vents~~ should be inspected for ~~exterior~~ damage and ~~or~~ corrosion. ~~Also, the vents should be inspected for signs of leakage from the pressure and or vacuum side of the vent.~~

~~1)~~2) ~~b) Inspect inlet and outlet flanges. Confirm nameplate information~~ Record manufacturer's nameplate information, such as model, ~~settings,~~ serial number, ~~a~~set point, flow rate, etc. on the repair traveler. ~~nd other information applicable to the vent type being serviced.~~

~~2)~~3) Record previous repair nameplate information on the repair traveler.

b) ~~2)~~ Pre-Disassembly Test ~~Set pressure check~~

~~a)~~ ~~W~~Weight loaded vents should ~~may~~ be tested prior to ~~before~~ disassembly to verify ~~check~~ the ~~initial opening of the~~ pressure and/or vacuum setting. ~~of the vent and~~ . Also, the vents should be inspected for signs of leakage from the pressure and/or vacuum port. The test results should be recorded ~~record the test results~~ on the repair traveler~~r~~ .~~.~~

1)

~~a)~~ Disassembly~~Disassembly~~

c)

~~1)~~ Safety practices and equipment applicable to the work being performed should be considered prior to commencing the repair. Each vent should be disassembled to the ~~-~~ extent necessary for thorough examination. Measures should be taken to ensure ~~-~~ traceability and segregation between pressure and vacuum components of the vent ~~-~~ assembly. ~~Safety practices and equipment applicable to the work being performed should be considered prior to starting work.~~

1)

2) Pressure Side Disassembly (as applicable)

~~a.~~ Secure assembly for removal of internal parts.

a.

~~b.~~ Remove pressure weather hood and screen or cover as applicable .[DDB1]

b.

~~c.~~ Remove weights from pressure side pallet, and place in appropriate bin to maintain traceability and segregation from vacuum side parts. Maintain the order in which the weights are stacked if varying sizes, types and/or thickness of weights are used.

c.

~~d.~~ Remove and disassemble pressure pallet assembly, and place in ~~appropriate~~ bin to maintain traceability and segregation from vacuum side parts.~~.~~

d.

e. Remove~~al~~ pressure seat if applicable and guiding components.

3) Vacuum Side Disassembly (as applicable)

a. Secure the vent assembly for removal of internal parts.

~~a.~~b. Remove vacuum cover and screen as applicable.

~~b.~~c. Remove weights from vacuum side pallet, and place in appropriate bin to maintain traceability and segregation from pressure side parts. Maintain the order in which the weights are stacked if varying sizes, types and/or thickness of weights are used.

~~b.~~d. Remove and disassemble vacuum pallet assembly, and place in bin to maintain traceability and segregation from pressure side parts.

~~c.~~e. Remove ~~al of~~ vacuum seat if applicable and guiding components~~. on some manufacturer's designs as required.~~

~~b)~~d) Cleaning

1) Care should be exercised to avoid damage to components (i.e. nameplates, seating/sealing surfaces, delicate components, etc.) caused by the cleaning method used.

~~1)~~2) Cleaning method used for weights is dependent on material of construction. [DDB2]

~~d)~~e) Internal Inspection

1) Vent s~~S~~eats and sealing surfaces should be inspected for signs of corrosion, erosion, pitting, scratches, cuts, or other damage that would create a leak path.

2) Main body, guiding components, and all pressure retaining attachments should be inspected for signs of wear, corrosion, erosion, pitting, cracks, or other damage that could affect proper operation.

3) Nonmetal components including diaphragms, O-rings, and gaskets should be inspected for holes, tears, signs of abnormal wear, or chemical attacks associated with process conditions.

~~e)~~f) Repair

1) ~~Seating Surfaces should be lapped to a smooth flat surface.~~ Vent seats~~Seating Surfaces~~ should be lapped to ensure they are flat ~~so that to a smooth flat surface is achieved~~.

2) Metal and non-metal components that are damaged should be replaced.

~~f)~~g) Assembly

If applicable, before beginning the reassembly process, weigh the pallet assembly including the weights, for pressure and/or vacuum setting[DDB3]. The m~~M~~anufacturer's weight calculations should be used, and the calculated weight for each setting should be recorded on the repair traveler.

1) Vacuum Side Assembly (as applicable)
   a. Secure the vent assembly for safe assembly of internal parts.
   ~~b.~~ Install vacuum seat and guide as required.
   b.
   ~~c.~~ Assemble and install the vacuum pallet assembly into the main ~~-~~vent body.
   c.
   ~~d.~~ Install weights on vacuum side pallet assembly. Stack weights from the largest diameter against the pallet.~~, if applicable.~~
   d.
   e. Install vacuum side cover cap, and screen if applicable.

2) Pressure Side Assembly (as applicable)
   a. Secure the vent for assembly of internal parts.
   b. Install pressure seat if applicable and guides.
   c. Assemble and Install pressure pallet assembly into main body.
   d. Install weights on pressure pallet assembly. Stack weights from the largest diameter against the pallet~~, if applicable.~~.
   e. Install pressure weather hood and screen or cover as applicable.

~~g)~~h) Testing

1) General Information
   a. Test equipment used to perform pressure and/or vacuum testing should be of adequate size to safely secure the vent during testing. ~~,~~

b. All flow meters and pressure/vacuum test gages used should cover the flow rates, and pressure ranges for the vents being tested. ~~,~~Test equipment should be calibrated and traceable to NIST standards.

2) Set Pressure Verification
   a. After final assembly, mount the vent on test stand.
   b. To check settings, increase pressure or vacuum on the test stand.
      1. The pressure setting shall be the test gauge pressure at which an increase in flow rate no longer increases gauge pressure.
      2. The v~~V~~acuum setting shall be the test gauge pressure at which an increase in flow rate no longer decreases gauge pressure.
   c. Pallet assembly weight may need to be adjusted to meet pressure/vacuum setting as required.
   d. If weight adjustments are made the vent should be retested.
   e. Record set pressure/vacuum on repair traveler.

3) Seat Tightness Verification
   a. Slowly increase the tank pressure to a ~~-~~minimum of 75% of vent set pressure.
   b. While maintaining 75% of set pressure for one minute ensure the test leak rate is in accordance with Table 1. This table applies to seat leakage testing for both pressure and vacuum. If the vent fails to meet leak-rate testing, it must be disassembled and repaired. This table complies with the requirements of API 2000.

~~Valve Size mm (in.)~~	~~Test Leak-Rate m^3/h (scfh)~~
~~≤ 150 (6)~~	~~0.014 (0.5)~~
~~200 – 400 (8 - 16)~~	~~0.142 (5.0)~~
~~> 400 (16)~~	~~0.566 (20)~~

   c. Record leak rates on the repair traveler for both pressure and vacuum as applicable.

Table 1: Test Flow Rate Specifications	
Vent Size mm (in.)	Test Leak-Rate m^3/h (scfh)
≤ 150 (6)	0.014 (0.5)
200 – 400 (8 - 16)	0.142 (5.0)
> 400 (16)	0.566 (20)

~~d.~~

~~h)~~i) Sealing

Tamper proof seals should be used to prevent tampering of external adjustments after the vent has been serviced and tested.

~~i)~~j) Repair Nameplate

1) Repaired b~~B~~y (organization performing repair)
2) Unique identification number
3) Date of r~~R~~epair
4) Model/Type (if changed)
5) Pressure s~~S~~etting (if applicable)
6) Vacuum s~~S~~etting (if applicable)

~~6)~~

~~S4.4~~S4.5 PACKAGING, SHIPPING AND TRANSPORTATION OF PRESSURE RELIEF DEVICES

a) The improper packaging, shipment, and transport of pressure relief devices can have detrimental effects on device operation. Pressure relief devices should be treated with the same precautions as instrumentation, with care taken to avoid rough handling or contamination prior to installation.

b) The following practices are recommended for spring loaded pressure relief valves and pilot operated pressure relief valves ~~for Direct Spring and Pilot Operated Valves~~:

1) Valves should be securely fastened to pallets in the vertical position to avoid side loads on guiding surfaces except threaded and socket-weld valves up to NPS 2 (DN 50) may be securely packaged and cushioned during transport.~~.~~

2) Valve inlet and outlet connection, drain connections, and bonnet vents should be protected during shipment and storage to avoid internal contamination of the valve. Ensure all covers and/or plugs are removed prior to installation.

3) The valve should not be picked up or carried using the lifting lever. Lifting levers should be wired or secured so they cannot be moved while the valve is being shipped or stored. These wires shall be removed before the valve is placed in service.

4) Pilot valve tubing should be protected during shipment and storage to avoid damage and/or breakage.

5) Valves for special services, including but not limited to oxygen, chlorine, and hydrogen peroxide, should be packaged in accordance with the appropriate standards and/or owner procurement requirements.

c) The following practices are recommended for weight loaded vent~~vents~~:

1) Vents should be securely fastened to pallets in the vertical position to avoid side loads on guiding surfaces, or otherwise securely packaged and cushioned during transport.

~~*1)*~~*2)* Weights packaged and shipped separately should be marked or ~~/~~labeled as either pressure, or vacuum prior to shipment. These segregated weights should be installed at the time of field installation, paying close attention as to whether they are pressure or vacuum weights.

~~*2)*~~*3)* All shipping blocks, metal bands, ~~any~~ protective inserts, and inlet/outlet protective covers that may be used for shipment must be removed prior to placing the vent in service.

NB14-0602B: Improve index in Part 2 relating to pressure relief devices

Suggested updates are in RED:

Blowdown
(2.2.10.3), (2.2.10.6), (2.2.12.2), (2.2.12.3), ~~(2.2.12.7),~~ (S2.4.3), (S2.7.1), ~~(S2.8.1),~~ (S2.9), (S2.11), (S2.13.1.2), (S2.14.7), (S2.14.12), ~~(S8.2),~~ ~~(S8.3),~~ ~~(S8.5)~~

Blowdown – Pressure Relief Devices
(2.2.12.7), (S2.8.1), (S2.11), (S8.2), (S8.3), (S8.5)

Burst Pressure – Rupture Disk
(S6.16.6), (2.5.5.4), (S6.16.9),

Capacity
(2.2.12.2), ~~(2.3.6.2),~~ (2.3.6.7.a), ~~(2.5.2), (2.5.4),~~ ~~(2.5.5.4),~~ ~~(2.5.7),~~ (5.3.4), ~~(S1.6), (S2.8.1), (S2.11),~~ ~~(S2.15),~~ (S5.3.1), (S5.3.3), (S6.8), (S6.13.11.2), (S6.13.11.3), (S6.13.11.4), (S6.15.1), (S6.15.4), ~~(9.1)~~

Capacity – Pressure Relief Devices
(2.3.6.2), (2.3.6.7.b.2), (2.3.6.2.10), (2.5.2), (2.5.4), (2.5.5.4), (2.5.7), (S1.6), (S2.8.1), (S2.11), (S2.14.16), (S2.15), (9.1), Form NB-5, Form NB-6, Form NB-7

Conversion – Units of Measure
(7.2), (7.3), ~~(9.1)~~

Conversion - Pressure Relief Device
(9.1)

Interval

Inspection/Time Interval
(2.5.5.4), (2.5.8), (2.5.8.1), (S6.4.7.5.1), (Index needs to be developed for non-PRD)

Test Interval – Pressure Relief Devices
(2.2.10.6), (2.5.8), (2.5.8.1), (S2.11)

Service Interval – Pressure Relief Devices
(2.5.8.2), (S2.11)

Pressure Relief Device Data
(2.5.1), (2.5.2)

Rupture ~~Discs~~Disks
Both Rupture Disc and Rupture Disk are both used thru out Part 2; Rupture Disk is more prevalent in body text yet not in the index. Spelling preference should be determined and index adjusted to reflect.
(S6.4.7.5.3), (S6.15.1), (S6.15.3.3), (S6.15.3.5)

NB15-0321
AMR suggested edits
6-30-2020

Main Committee Ballot comments:

Mr. Rick Sturm: I have voted against this as I believe that in 3.2.4.4 paragraph 11 and 12 as well as where wording is duplicated in 2.5.5.4 the "should's" should be changed to "Shall" i.e. checking for bends/deflections of pins or bars, markings on pins as well as shall be taken out of service.If someone can provide me with why they can remain a should instead of a shall I would appreciate it.

Mr. Donnie LeSage: I had the same thoughts as Mr. Rick Sturm as I was reading the proposal. I agree with his recommendation to change the Shoulds to Shall.

Mr. Venus Newton: You should be providing clearer guidance on what is meant by "periodic" and periodically means. The code needs to be as specific as we can about how often to perform these tests.

Mr. Rob Troutt: I agree with Mr. Rick Sturm, the word "should" needs to be changed to "Shall".

Mr. Bob Wielgoszinski:
Part 4:

- 3.2.4.4g) 13) add the word "to" before prevent in the 2nd line.
- 3.2.5.2c) reference is made to "3.2.6". I could not locate that paragraph. Is the 1 through 6 below 3.2.5.2c) intended to be 3.2.6?
- 3.2.5.4a) although it does not appear to part of this action, the text says that the system "should" be taken out of service if the pin/bar is stuck closed. Should that be changed to "shall"? Why would we have a system running with a dysfunctional PRD?

Part 2: (NOTE THAT THESE ARE MUCH THE SAME COMMENTS AS FOR PART 4 above)

- 2.5.5.4g)13) add the word "to" before prevent in the 2nd line.
- 2.5.7.2 c) I see no requirements of instruction for freedom of motion inspection in 2.5.8. Was the 1 through 6 below intended to be the instruction?
- 2.5.7.4a) although it does not appear to part of this action, the text says that the system "should" be taken out of service if the pin/bar is stuck closed. Should that be changed to "shall"? Why would we have a system running with a dysfunctional PRD?

PART 4

3.2.4.4 ~~RUPTURE DISKS~~NON-RECLOSING PRESSURE RELIEF DEVICES

g) For rupture disks and other non-reclosing devices, the following additional items should be considered during inspections.

No changes under 3.2.4.4 g)1) through g)10). New text as follows under 3.2.4.4 g)11) through g)14).

11) For non-reclosing PRDs that use pins or bars, those components should be checked for bends/deflection, cracks, or corrosion. Pin deflection may be the results of pin fasteners being overtightened.

12) For non-reclosing PRDs that use pins or bars, the markings on those components should be checked against information on the device nameplate to ensure that they are installed on the correct device. If markings are illegible or missing, the device should be taken out of service and the pin or bar should be replaced with a component specified by the manufacturer. Replacement shall not be performed while the device is pressurized.

13) For non-reclosing PRDs that use pins or bars, check that there is no foreign object present that could interfere with the bar or pin, prevent proper operation of the device, hold the device shut.

14) It is recommended that pins or bars be replaced periodically to prevent unintended failure while in service due to deterioration of the load-bearing component.

3.2.5 GENERAL CONSIDERATIONS FOR TESTING AND OPERATIONAL INSPECTION OF PRESSURE RELIEF DEVICES

a) Pressure relief ~~valves shall be tested periodically to ensure that they are free to operate and will operate~~devices shall be subject to periodic inspection and/or testing based upon the type of device. ~~in accordance with the requirements of the original code of construction. Testing should include device set or opening pressure, reclosing pressure, where applicable, and seat leakage evaluation. Tolerances specified for these operating requirements in the original code of construction shall be used to determine the acceptability of test results.~~

b) Testing may be accomplished by the owner on the unit where the valve is installed or at a qualified test facility. In many cases, testing on the unit may be impractical, especially if the service fluid is hazardous or toxic. Testing on the unit may involve the bypassing of operating controls and should only be performed
by qualified individuals under carefully controlled conditions. It is recommended that a written procedure be available to conduct this testing.

1) The Inspector should ensure that calibrated equipment has been used to perform this test and the results should be documented by the owner.

2) If the testing ~~was~~ is performed at a test facility, the record of this test should be reviewed to ensure the ~~valve~~ device meets the requirements of the original code of construction. ~~Valves~~ Devices which have been in toxic, flammable, or other hazardous services shall be carefully decontaminated before being tested. In particular, the closed bonnet of valves in these services may contain fluids that are not easily removed or neutralized. If a test cannot be safely performed, the ~~valve~~ device shall be disassembled, cleaned, ~~and~~ decontaminated, repaired, and reset.
3) If a ~~valve~~ device has been removed for testing, the inlet and outlet connections should be checked for blockage by product buildup or corrosion.

3.2.5.1 TESTING AND OPERATIONAL INSPECTION OF PRESSURE RELIEF VALVES

In addition to 3.2.5, the following apply to testing and operational inspection of pressure relief valves.

a) Pressure relief valves shall be tested periodically to ensure that they are free to operate and will operate in accordance with the requirements of the original code of construction. Testing should include device set or opening pressure, reclosing pressure, where applicable, and seat leakage evaluation. Tolerances specified for these operating requirements in the original code of construction shall be used to determine the acceptability of test results.

b) Valves may be tested using lift assist devices when testing at full pressure may cause damage to the valve being tested, or it is impractical to test at full pressure due to system design considerations. Lift assist devices apply an auxiliary load to the valve spindle or stem, and using the measured inlet pressure, applied load and other valve data allow the set pressure to be calculated. If a lift assist device is

used to determine valve set pressure, the conditions of 4.6.3 shall be met. It should be noted that false set pressure readings may be obtained for valves which are leaking excessively or otherwise damaged.

~~c~~c) If valves are not tested on the system using the system fluid, the following test mediums shall be used:

1) High pressure boiler pressure relief valves, high temperature hot-water boiler pressure relief valves, low pressure steam heating boilers: steam;

2) Hot-water heating boiler pressure relief valves: steam, air, or water;

3) Hot water heater temperature and pressure relief valves: air or water;

4) Air and gas service process pressure relief valves: air, nitrogen, or other suitable gas;

5) Liquid service process pressure relief valves: water or other suitable fluid;

6) Process steam service pressure relief valves: steam or air with manufacturer's steam to air correction factor.

Note: Valves being tested after a repair must be tested on steam except as permitted by 4.6.2.

~~d~~d) As an alternative to a pressure test, the valve may be checked by the owner for freedom of operation by activating the test or "try" lever (manual check). For high pressure boiler and process valves, this test should be performed only at a pressure greater than 75% of the stamped set pressure of the valve or the lifting device may be damaged. This test will only indicate that the valve is free to operate and does not provide any information on the actual set pressure. All manual checks should be performed with some pressure under the valve in order to flush out debris from the seat that could cause leakage.

Note: The manual check at 75% or higher is based on lift lever design requirements for ASME Section I and VIII valves. Code design requirements for lifting levers for Section IV valves require that the valve be capable of being lifted without pressure.

~~f~~e) Systems with multiple valves will require the lower set valves to be held closed to permit the higher set valves to be tested. A test clamp or "gag" should be used for this purpose. The spring compression screw shall not be tightened. It is recommended that the test clamps be applied in accordance with the valve manufacturer's instructions when the valve is at or near the test temperature, and be applied hand tight only to avoid damage to the valve stem or spindle.

~~g~~f) Upon completion of set pressure testing, all pressure relief valve gags shall be removed. Any stop valves used to isolate lower set pressure relief devices shall be reopened (and locked, if applicable).

3.2.5.2 TESTING AND OPERATIONAL INSPECTION OF NON-RECLOSING PRESSURE RELIEF DEVICES WITH PINS OR BARS

In addition to 3.2.5, the following apply to testing and operational inspection of non-reclosing PRDs with pins or bars.

a) Periodic set point testing is not required since pins or bars are single use.

b) Periodic inspection shall be per 3.2.4.4.

c) Non-reclosing PRDs shall be periodically inspected by the owner for freedom of motion. Freedom of motion inspection frequency shall be per 3.2.6.

1) Remove pressure from the PRD, or remove the PRD from service, prior to performing this check.

2) Remove the pin or bar.

3) Manually exercise the sealing mechanism to ensure it is capable of its full range of motion.

4) Reinstall the pin or bar or replace with new. Replacement pin or bar shall be per manufacturer recommendation.

5) Restore pressure to the PRD.

6) The PRD should be checked for seat leakage following restoration of pressure.

d) The owner may elect to have a non-reclosing PRD tested periodically in order to determine service life of the device. Such tests should ensure that the PRD is free to operate and will operate in accordance with the requirements of the original code of construction. Testing should include device set or opening pressure and seat leakage evaluation. Tolerances specified for these operating requirements in the original code of construction should be used to determine the acceptability of test results.

3.2.5.3 TESTING AND OPERATIONAL INSPECTION OF RUPTURE DISKS

In addition to 3.2.5, the following apply to testing and operational inspection of rupture disks.

a) Periodic testing of rupture disks is not required

b) Rupture disks shall be subject to periodic inspection per 3.2.4.4.

c) The owner may elect to have a rupture disks tested periodically in order to determine service life. Such tests should ensure that the disk is free to operate inside its holder and will operate in accordance with the requirements of the original code of construction. Testing should include an evaluation of leakage through the disk (e.g. due to cracks or porosity), followed by device opening or burst pressure at rated temperature. Tolerances specified for these operating requirements in the original code of construction should be used to determine the acceptability of test results.

d) If PRDs are not tested on the system using the system fluid, the following test mediums shall be used:

1) Air and gas service PRDs: air, nitrogen, or other suitable gas;

2) Liquid service PRDs: water or other suitable fluid.

3.2.5.~~1~~ 4 CORRECTIVE ACTION

a) If a ~~valve~~ pressure relief valve or a non-reclosing PRD that is actuated by a pin or bar is found to be stuck closed, the system should immediately be taken out of service until the condition can be corrected, unless special provisions have been made to operate on a temporary basis (such as additional relief capacity provided by another valve.) The owner shall be notified and corrective action such as repairing or replacing the inoperable ~~valve~~ device shall be taken.

b) If a pressure relief device leaks, the owner shall be notified and decide what corrective action (if any) will be taken.

PART 2

2.5.5.4 ~~RUPTURE DISKS~~NON-RECLOSING PRESSURE RELIEF DEVICES

g) For rupture disks and other non-reclosing devices, the following additional items should be considered during inspections.

No changes under 2.5.5.4 g)1) through g)10). New text as follows under 2.5.5.4 g)11) through g)14).

11) For non-reclosing PRDs that use pins or bars, those components should be checked for bends/deflection, cracks, or corrosion. Pin deflection may be the results of pin fasteners being overtightened.

12) For non-reclosing PRDs that use pins or bars, the markings on those components should be checked against information on the device nameplate to ensure that they are installed on the correct device. If markings are illegible or missing, the device should be taken out of service and the pin or bar should be replaced with a component specified by the manufacturer. Replacement shall not be performed while the device is pressurized.

13) For non-reclosing PRDs that use pins or bars, check that there is no foreign object present that could interfere with the bar or pin, prevent proper operation of the device, hold the device shut.

14) It is recommended that pins or bars be replaced periodically to prevent unintended failure while in service due to deterioration of the load-bearing component.

2.5.7 GENERAL CONSIDERATIONS FOR TESTING AND OPERATIONAL INSPECTION OF PRESSURE RELIEF DEVICES

a) Pressure relief ~~valves shall be tested periodically to ensure that they are free to operate and will operate~~devices shall be subject to periodic inspection and/or testing based upon the type of device. ~~in accordance with the requirements of the original code of construction. Testing should include device set or opening pressure, reclosing pressure, where applicable, and seat leakage evaluation. Tolerances specified for these operating requirements in the original code of construction shall be used to determine the acceptability of test results.~~

b) Testing may be accomplished by the owner on the unit where the valve is installed or at a qualified test facility. In many cases, testing on the unit may be impractical, especially if the service fluid is hazardous or toxic. Testing on the unit may involve the bypassing of operating controls and should only be performed
by qualified individuals under carefully controlled conditions. It is recommended that a written procedure be available to conduct this testing.

1) The Inspector should ensure that calibrated equipment has been used to perform this test and the results should be documented by the owner.

2) If the testing ~~was~~ is performed at a test facility, the record of this test should be reviewed to ensure the ~~valve~~ device meets the requirements of the original code of construction. ~~Valves~~ Devices which have been in toxic, flammable, or other hazardous services shall be carefully decontaminated before being tested. In particular, the closed bonnet of valves in these services may contain fluids that are not easily removed or neutralized. If a test cannot be safely performed, the ~~valve~~ device shall be disassembled, cleaned, ~~and~~ decontaminated, repaired, and reset.
3) If a ~~valve~~ device has been removed for testing, the inlet and outlet connections should be checked for blockage by product buildup or corrosion.

2.5.7.1 TESTING AND OPERATIONAL INSPECTION OF PRESSURE RELIEF VALVES

In addition to 2.5.7, the following apply to testing and operational inspection of pressure relief valves.

a) Pressure relief valves shall be tested periodically to ensure that they are free to operate and will operate in accordance with the requirements of the original code of construction. Testing should include device set or opening pressure, reclosing pressure, where applicable, and seat leakage evaluation. Tolerances specified for these operating requirements in the original code of construction shall be used to determine the acceptability of test results.

b) Valves may be tested using lift assist devices when testing at full pressure may cause damage to the valve being tested, or it is impractical to test at full pressure due to system design considerations. Lift assist devices apply an auxiliary load to the valve spindle or stem, and using the measured inlet pressure, applied load and other valve data allow the set pressure to be calculated. If a lift assist device is used to determine valve set pressure, the conditions of 4.6.3 shall be met. It should be noted that false set pressure readings may be obtained for valves which are leaking excessively or otherwise damaged.

~~c~~c) If valves are not tested on the system using the system fluid, the following test mediums shall be used:

1) High pressure boiler pressure relief valves, high temperature hot-water boiler pressure relief valves, low pressure steam heating boilers: steam;

2) Hot-water heating boiler pressure relief valves: steam, air, or water;

3) Hot water heater temperature and pressure relief valves: air or water;

4) Air and gas service process pressure relief valves: air, nitrogen, or other suitable gas;

5) Liquid service process pressure relief valves: water or other suitable fluid;

6) Process steam service pressure relief valves: steam or air with manufacturer's steam to air correction factor.

Note: Valves being tested after a repair must be tested on steam except as permitted by 4.6.2.

~~d~~d) As an alternative to a pressure test, the valve may be checked by the owner for freedom of operation by activating the test or "try" lever (manual check). For high pressure boiler and process valves, this test should be performed only at a pressure greater than 75% of the stamped set pressure of the valve or the lifting device may be damaged. This test will only indicate that the valve is free to operate and does not provide any information on the actual set pressure. All manual checks should be performed with some pressure under the valve in order to flush out debris from the seat that could cause leakage.

Note: The manual check at 75% or higher is based on lift lever design requirements for ASME Section I and VIII valves. Code design requirements for lifting levers for Section IV valves require that the valve be capable of being lifted without pressure.

~~f~~e) Systems with multiple valves will require the lower set valves to be held closed to permit the higher set valves to be tested. A test clamp or "gag" should be used for this purpose. The spring compression screw shall not be tightened. It is recommended that the test clamps be applied in accordance with the valve manufacturer's instructions when the valve is at or near the test temperature, and be applied hand tight only to avoid damage to the valve stem or spindle.
~~g~~f) Upon completion of set pressure testing, all pressure relief valve gags shall be removed. Any stop valves used to isolate lower set pressure relief devices shall be reopened (and locked, if applicable).

2.5.7.2 TESTING AND OPERATIONAL INSPECTION OF NON-RECLOSING PRESSURE RELIEF DEVICES WITH PINS OR BARS

In addition to 2.5.7, the following apply to testing and operational inspection of non-reclosing PRDs with pins or bars.

a) Periodic set point testing is not required since pins or bars are single use.

b) Periodic inspection shall be per 2.5.5.4.

c) Non-reclosing PRDs shall be periodically inspected by the owner for freedom of motion. Freedom of motion inspection frequency shall be per 2.5.8.

1) Remove pressure from the PRD, or remove the PRD from service, prior to performing this check.

2) Remove the pin or bar.

3) Manually exercise the sealing mechanism to ensure it is capable of its full range of motion.

4) Reinstall the pin or bar or replace with new. Replacement pin or bar shall be per manufacturer recommendation.

5) Restore pressure to the PRD.

6) The PRD should be checked for seat leakage following restoration of pressure.

d) The owner may elect to have a non-reclosing PRD tested periodically in order to determine service life of the device. Such tests should ensure that the PRD is free to operate and will operate in accordance with the requirements of the original code of construction. Testing should include device set or opening pressure and seat leakage evaluation. Tolerances specified for these operating requirements in the original code of construction should be used to determine the acceptability of test results.

2.5.7.3 TESTING AND OPERATIONAL INSPECTION OF RUPTURE DISKS

In addition to 2.5.7, the following apply to testing and operational inspection of rupture disks.

a) Periodic testing of rupture disks is not required

b) Rupture disks shall be subject to periodic inspection per 2.5.5.4.

c) The owner may elect to have a rupture disks tested periodically in order to determine service life. Such tests should ensure that the disk is free to operate inside its holder and will operate in accordance with the requirements of the original code of construction. Testing should include an evaluation of leakage through the disk (e.g. due to cracks or porosity), followed by device opening or burst pressure at rated temperature. Tolerances specified for these operating requirements in the original code of construction should be used to determine the acceptability of test results.

d) If PRDs are not tested on the system using the system fluid, the following test mediums shall be used:

1) Air and gas service PRDs: air, nitrogen, or other suitable gas;

2) Liquid service PRDs: water or other suitable fluid.

2.5.7.~~1~~ 4 CORRECTIVE ACTION

a) If a ~~valve~~ pressure relief valve or a non-reclosing PRD that is actuated by a pin or bar is found to be stuck closed, the system should immediately be taken out of service until the condition can be corrected, unless special provisions have been made to operate on a temporary basis (such as additional relief capacity provided by another valve.) The owner shall be notified and corrective action such as repairing or replacing the inoperable ~~valve~~ device shall be taken.

b) If a pressure relief device leaks, the owner shall be notified and decide what corrective action (if any) will be taken.

Item 17-128
1-14-2020

Part 4:

2.4.4.3 REQUIREMENTS FOR COMMON CONNECTION FOR TWO OR MORE VALVES

a) When a potable water heater is fitted with two or more temperature and pressure relief valves on one connection, this connection shall have a cross sectional area not less than the combined areas of inlet connections of all the temperature and pressure relief valves with which it connects.

~~b) When a Y-base is used, the inlet area shall be not less than the combined outlet areas.~~

~~c)~~b) When the size of the water heater requires a temperature and pressure relief valve larger than NPS 4 (DN 100) two or more valves having the required combined capacity shall be used. ~~When two or more valves are used on a water heater, they may be single, directly attached, or installed on a Y-base.~~

Part 1:

3.9.4.3 REQUIREMENTS FOR COMMON CONNECTION FOR TWO OR MORE VALVES

a) When a potable water heater is fitted with two or more temperature and pressure relief valves on one connection, this connection shall have a cross sectional area not less than the combined areas of inlet connections of all the temperature and pressure relief valves with which it connects.

~~b) When a Y-base is used, the inlet area shall be not less than the combined outlet areas.~~

~~c)~~b) When the size of the water heater requires a temperature and pressure relief valve larger than NPS 4 (DN 100) two or more valves having the required combined capacity shall be used. ~~When two or more valves are used on a water heater, they may be single, directly attached, or installed on a Y-base.~~

ITEM 18-73 Proposal Rev. 3/25/20

PART 4

2.3 OVERPRESSURE PROTECTION FOR THERMAL FLUID HEATERS

2.3.1 GENERAL REQUIREMENTS

Thermal fluid heaters shall be provided with overpressure protection in accordance with the code of construction.

2.3.2 PRESSURE RELIEF ~~DEVICES~~VALVES

Thermal fluid heaters shall be equipped with one or more pressure relief ~~devices~~ valves unless the option for overpressure protection by system design is utilized (when permitted by the original code of construction). When pressure relief ~~devices~~ valves are used, the following shall apply:

a) Pressure relief valve(s) shall be of a totally enclosed type. ~~and shall not have a lifting lever. A body drain is not required.~~

b) A lifting lever shall not be used in pressure relief valve(s). A body drain is not required.

~~b) Rupture disks may be installed upstream or downstream of the pressure relief valve(s) in accordance with the original code of construction.~~

c) Pressure relief valves ~~and rupture disks~~ shall be in accordance with the code of construction and designed for liquid, vapor, or combination service as required for the specific installation, service fluids, and overpressure conditions.

d) Cast iron fittings shall not be used.

e) Copper and copper alloys shall not be used.

~~d~~f) The inlet connection to the valve shall be not less than NPS ½ (DN 15).

2.3.3 LOCATION

Pressure relief ~~devices~~ valves shall be connected to the heater in accordance with the original code of construction.

2.3.4 CAPACITY

The pressure relief ~~device(s)~~valve(s) shall have sufficient capacity to prevent the pressure vessel from exceeding the maximum pressure specified in the vessel code of construction.

2.3.5 SET PRESSURE

a) When a single relief ~~device~~ valve is used, the set pressure marked on the device shall not exceed the maximum allowable working pressure.

b) When more than one pressure relief ~~device~~ valve is provided to obtain the required capacity, only one pressure relief ~~device~~ valve set pressure needs to be set at or below the maximum allowable working

pressure. The set pressure of the additional relief ~~devices~~ valves shall be such that the pressure cannot exceed the maximum pressure permitted by the code of construction.

2.3.6 INSTALLATION

Pressure relief valves and the associated discharge piping shall be installed in accordance with the heater Manufacturer's recommendations. The installation of the pressure relief valves required for Thermal Fluid Heaters shall include but not be limited to following requirements:

a) The pressure relief valve shall be provided with discharge piping. ~~When a discharge pipe is used, t~~The cross-sectional area of discharge piping shall not be less than the full area of the valve outlet. The size of the discharge lines shall be such that any pressure that may exist or develop will not reduce the relieving capacity or adversely affect the operation of the attached pressure vessel relief ~~devices~~valves. Discharge piping shall be as short and straight as possible and arranged to avoid undue stress on the pressure relief ~~device~~valve.

b) The pressure relief valve shall be connected to the pressure vessel in accordance with the original code of construction.

~~b~~c) The cross sectional area of the piping between the heater and the relief device shall be sized either to avoid restricting the flow to the pressure relief devices or made at least equal to the inlet area of the pressure relief devices connected to it.

~~c~~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 the flow to the pressure relief devices or made at least equal to the combined inlet areas of the pressure relief devices connected to it.

~~d~~e) Unless permitted by the code of construction, there shall be no intervening stop valve between the vessel and its pressure relief device(s), or between the pressure relief device and the point of discharge.

~~e~~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, such as a catchment tank, for the disposal of fluids being relieved.

~~f~~g) Discharge lines from pressure relief ~~devices~~ valves shall be designed to facilitate drainage. ~~or be fitted with low point or valve body drains to prevent liquid from collecting in the discharge side of a pressure relief device.~~ Drain piping shall discharge to a safe location for the disposal of the fluids being relieved. The possibility of solidification of fluid leakage into the discharge piping system shall be considered.

~~g~~h) The pressure relief discharge ~~should~~ shall be connected to a closed, vented storage tank ~~or blowdown tank~~ with solid piping (no drip pan elbow~~,~~ or other air gap). The storage tank should be located as close to the system as possible, but away from flammable surfaces. Overflow or high level protection should be considered. The capacity of the storage tank should consider the volume of fluid which may be relieved or sized in accordance with the heater manufacturer's recommendation. Storage tanks located outdoors shall be located such that water cannot collect in the vessel. ~~When outdoor discharge is used,~~

~~t~~The following ~~should~~ shall be considered for discharge piping hazards.

~~at the point of discharge:~~

1) Both thermal and chemical reactions (personnel hazard);

2) Combustible materials (fire hazard);

3) Surface drains (pollution and fire hazard);

~~4) Loop seal or rain cap on the discharge (keep both air and water out of the system);~~

~~5) Drip leg near device (prevent liquid collection); and~~

~~6~~4) Heat tracing for systems using high freeze point fluids along the discharge line (prevent blockage).

~~h) A condenser that will condense all the vapors discharged from the pressure relief valve may be used in lieu of piping the vapors to the atmosphere.~~

~~i) In order to minimize the loss by leakage of material through the pressure relief valve, a rupture disk may be installed between the pressure relief valve and the vaporizer, provided the following requirements are met:~~

~~1) The cross-sectional area of the connection to a vaporizer shall be not less than the required relief area of the rupture disk.~~

~~2) The maximum pressure of the range for which the disk is designed to rupture shall not exceed the opening pressure for which the pressure relief valve is set or the maximum allowable working pressure of the vessel.~~

~~3) The opening provided through the rupture disk, after breakage, shall be sufficient to permit a flow equal to the capacity of the attached valve, and there is no chance of interference with the proper functioning of the valve, but in no case shall this area be less than the inlet area of the valve.~~

~~4) The space between a rupture disk and the valve shall be provided with a pressure gage, try cock, free vent, or a suitable telltale indicator. This arrangement permits the detection of disk rupture or leakage.~~

~~j~~i) Pressure relief valve discharge capacity for liquid service shall be determined from the following equation:

~~W = CKAP √(M/T)~~
~~Where:~~
~~A = discharge area of pressure relief valve~~
~~C = constant for vapor that is a function of the ratio of specific heats k = cp/cv .~~
~~**Note:** Where k is not known, k = 1.001.~~
~~K = coefficient of discharge for the valve design~~
~~M = molecular weight~~

~~P = (set pressure × 1.03) + Atmosphere Pressure~~
~~T = absolute temperature at inlet, °F + 460 (°C + 273)~~
~~W = flow of vapor~~

~~The required minimum pressure relief valve relieving capacity shall be determined from the following equation:~~

~~W = C x H x 0.75/h~~
~~Where:~~
~~C = maximum total weight or volume of fuel burned per hour, lb (kg) or ft3 (m3)~~
~~H = heat of combustion of fuel, Btu/lb (J/kg) or Btu/ft3 (J/m3)~~
~~h = latent heat of heat transfer fluid at relieving pressure, Btu/lb (J/kg)~~
~~W = weight of organic fluid vapor generated per hour~~
~~The sum of the pressure relief valve capacities marked on the valves shall be equal to or greater than W.~~

For Liquid
U.S. Customary Units
$W = 2{,}407KA\sqrt{(P - Pd)w}$

SI Units
$W = 5.092\ KA\sqrt{(P - Pd)w}$

Where.
W = Liquid Capacity in lb/hr (kg/hr).
A = Discharge Area of Pressure relief Valve, in^2 (mm^2)
K = coefficient of discharge for valve design
P = (Set pressure + OP + Atmosphere pressure, psia (Mpa)
OP = Overpressure required for Pressure Relief
Valve to reach capacity specified in
code of construction
Pd = Pressure at discharge of valve, psia (Mpa)
w = Specific weight of liquid at inlet condition
lb/ft^3 (kg/m^3)

To convert lb/hr of water to gal/min, multiply the capacity in lb/hr by 1/500.

!!!!!!! (SEE PART 1 PROPOSAL BEGINNING ON NEXT PAGE) !!!!!!!

PART 1

S5.7 OVERPRESSURE PROTECTION

S5.7.1 GENERAL REQUIREMENTS

Thermal fluid heaters shall be provided with overpressure protection in accordance with the code of construction.

S5.7.2 PRESSURE RELIEF ~~DEVICES~~VALVES

Thermal fluid heaters shall be equipped with one or more pressure relief ~~devices~~ valves unless the option for overpressure protection by system design is utilized (when permitted by the original code of construction).
When pressure relief devices are used, the following shall apply:

a) Pressure relief valve(s) shall be of a totally enclosed type. ~~and shall not have a lifting lever. A body drain is not required.~~

b) A lifting lever shall not be used in pressure relief valve(s). A body drain is not required.

~~b) Rupture disks may be installed upstream or downstream of the pressure relief valve(s) in accordance with the original code of construction.~~

c) Pressure relief valves ~~and rupture disks~~ shall be in accordance with the code of construction and designed for liquid, vapor, or combination service as required for the specific installation, service fluids, and overpressure conditions.

d) Cast iron fittings shall not be used

e) Copper and copper alloys shall not be used

~~d~~f) The inlet connection to the valve shall be not less than NPS ½ (DN 15).

S5.7.3 LOCATION

Pressure relief ~~devices~~ valves shall be connected to the heater in accordance with the original code of construction.

S5.7.4 CAPACITY

The pressure relief ~~device(s)~~valve(s) shall have sufficient capacity to prevent the pressure vessel from exceeding the maximum pressure specified in the vessel code of construction.

S5.7.5 SET PRESSURE

a) When a single relief ~~device~~ valve is used, the set pressure marked on the device shall not exceed the maximum allowable working pressure.

b) When more than one pressure relief ~~device~~ valve is provided to obtain the required capacity, only one pressure relief ~~device~~ valve set pressure needs to be set at or below the maximum allowable working pressure. The set pressure of the additional relief ~~devices~~ valves shall be such that the pressure cannot exceed the maximum pressure permitted by the code of construction.

S5.7.6 INSTALLATION

Pressure relief valves and the associated discharge piping shall be installed in accordance with the heater Manufacturer's recommendations. The installation of the pressure relief valves required for Thermal Fluid Heaters shall include but not be limited to following requirements.

a) The pressure relief valve shall be provided with discharge piping. ~~When a discharge pipe is used, t~~The cross-sectional area of the discharge piping shall not be less than the full area of the valve outlet. The size of the discharge lines shall be such that any pressure that may exist or develop will not reduce the relieving capacity or adversely affect the operation of the attached pressure vessel relief ~~devices~~valves. Discharge piping shall be as short and straight as possible and arranged to avoid undue stress on the pressure relief ~~device~~valve.

b) The pressure relief valve shall be connected to the pressure vessel in accordance with the original code of construction.

~~b~~c) The cross sectional area of the piping between the heater and the relief ~~device~~ valve shall be sized either to avoid restricting the flow to the pressure relief ~~devices~~ valves or made at least equal to the inlet area of the pressure relief ~~devices~~ valves connected to it.

~~c~~d) When two or more required pressure relief ~~devices~~ valves are placed on one connection, the inlet cross-sectional area of this connection shall be sized either to avoid restricting the flow to the pressure relief ~~devices~~ valves or made at least equal to the combined inlet areas of the pressure relief ~~devices~~ valves connected to it.

~~d~~e) Unless permitted by the code of construction, there shall be no intervening stop valve between the vessel and its pressure relief ~~device(s)~~valve(s), or between the pressure relief ~~device~~ valve and the point of discharge.

~~e~~f) Pressure relief ~~device~~ valve discharges shall be arranged such that they are not a hazard to personnel or other equipment and, when necessary, lead to a safe location, such as a catchment tank, for the disposal of fluids being relieved.

~~f~~g) Discharge lines from pressure relief ~~devices~~ valves shall be designed to facilitate drainage~~. or be fitted with low point or valve body drains to prevent liquid from collecting in the discharge side of a pressure relief device~~. Drain piping shall discharge to a safe location for the disposal of the fluids being relieved. The possibility of solidification of fluid leakage into the discharge piping system shall be considered.

h) The pressure relief valve discharge shall be connected to a closed, vented storage tank with solid piping (no drip pan elbow or other air gap). The storage tank should be located as close to the system as possible, but away from flammable surfaces. Overflow or high level protection should be considered. The capacity of the storage tank should consider the volume of fluid which may be relieved or sized in accordance with the heater manufacturer's recommendation. Storage tanks located outdoors shall be located such that water cannot collect in the vessel.

The following shall be considered for discharge piping hazards.

1) Both thermal and chemical reactions (personnel hazard).

2) Combustible materials (fire hazard)

3) Surface drains (pollution and fire hazard)

4) Heat tracing for systems using high freeze point fluids (prevent blockage)

i) Pressure relief valve discharge capacity for liquid service shall be determined from the following equation:

For Liquid
U.S. Customary Units
$W = 2{,}407KA\sqrt{(P - Pd)w}$

SI Units
$W = 5.092\ KA\sqrt{(P - Pd)w}$

Where.
W = Liquid Capacity in lb/hr (kg/hr).
A = Discharge Area of Pressure relief Valve, in^2 (mm^2)
K = coefficient of discharge for valve design
P = (Set pressure + OP + Atmosphere pressure, psia (Mpa)
OP = Overpressure required for Pressure Relief
Valve to reach capacity specified in
code of construction
Pd = Pressure at discharge of valve, psia (Mpa)
w = Specific weight of liquid at inlet condition
lb/ft^3 (kg/m^3)

To convert lb/hr of water to gal/min, multiply the capacity in lb/hr by 1/500.

ITEM 18-80 Proposal 7-6-20

PART 4

SUPPLEMENT 4
RECOMMENDED PROCEDURES FOR REPAIRING PRESSURE RELIEF VALVES

S4.1 ~~INTRODUCTION~~SCOPE

This supplement contains recommended procedures for the repair, packaging, shipping and transportation of pressure relief valves. S4.2 contains recommended procedures for the repair of spring-loaded pressure relief valves, ~~and~~ S4.3 contains recommended procedures for the repair of pilot operated types of pressure relief valves. S4.4 contains ~~i~~information on packaging, shipping and transportation. ~~is included as S4.5.~~

~~a)~~ It is essential that the repair organization establish basic, specific procedures for the repair of pressure relief valves. The purpose of these recommended procedures is to provide the repair organization with guidelines for this important aspect of valve repair. It is realized that there are many types of valves and conditions under which they are repaired and, for this reason, the specific items in these recommended procedures may not apply, or they may be inadequate for each of those types or to the detailed repairs that may be required for each valve.

~~b)~~ Prior to removal, repair, or disassembly of a pressure relief valve ensure that all sources of pressure have been removed.

~~c) S4.2 contains recommended procedures for the repair of spring-loaded pressure relief valves, and S4.3 contains recommended procedures for the repair of pilot operated types of pressure relief valves. Information on packaging, shipping and transportation is included as S4.5.~~

SUPPLEMENT 5
RECOMMENDED GUIDE FOR THE DESIGN OF A TEST SYSTEM FOR PRESSURE RELIEF DEVICES IN COMPRESSIBLE FLUID SERVICE

S5.1 SCOPE

This supplement provides guidance for the design of a test system using compressible fluids (e.g., steam or air/gas) and permits the determination of pressure relief valve set pressure and valve operating characteristics such as blowdown.

The size of the test vessel needed depends on the size of the valve, its set pressure, the design of the test system, and whether blowdown must be demonstrated. A repair organization may use the information provided in this supplement to determine the minimum size test vessel needed so that the measured performance is characteristic of the valve and not the test system.

~~S5.2 GENERAL~~

a) The National Board administrative rules and procedures for the “VR” *Certificate of Authorization* and symbol stamp require that pressure relief valves, after repair, be tested in accordance with the manufacturer’s recommendations and the applicable ASME Code. The purpose of this testing is to provide reasonable assurance that valves will perform according to design when they are returned to service.

b) It is recognized that a full evaluation of the performance of some pressure relief valve designs requires testing at maximum allowable overpressure. However, it is beyond the scope of this supplement to

define test equipment or facilities for such testing.

c) Section 6 of this part provides a glossary, S5.~~3~~ 2 describes typical test equipment, and S5.~~4~~ 3 provides data for estimating the size of test vessels required.

S5.~~3~~ 2 TEST SYSTEM DESCRIPTION

a) An optimum configuration, particularly when the test medium source is of small capacity, is shown in Figure S5.~~3~~2-a. The test medium flows from the pressure source, usually a compressor or boiler, to an accumulator. It then flows through a pressure-controlling valve into the test vessel, from which it is discharged, through the pressure relief valve installed on the test vessel. The pressure-controlling valve is usually a globe valve, although any throttling valve is acceptable. If the pressure-controlling valve is of adequate size and can open quickly, large transient flows can be generated, increasing the pressure above the pressure relief valve set pressure, causing it to lift, and be sustained in its lifted condition.

b) Figure S5.~~3~~2-b shows a simpler test system in which the test vessel is pressurized directly from the pressure source without the use of an accumulator. In this configuration, flow-rates through the pressure relief valve and any consequent over-pressure are dependent on the flow generating capacity of the pressure source.

c) In a test facility, the pressure relief valve is usually installed on an isolating valve that should be of sufficient size that it will not choke flow to the pressure relief valve. There should be no intervening piping between the two valves to avoid any significant pressure drop between the test vessel and the pressure relief valve.

d) The isolating valve and any adapter flanges or valve test nozzles must be designed to sustain pressure relief valve discharge forces, and so secured that these forces are not transmitted to the test vessel. This is especially important for larger valves set at pressures greater than 100 psig (700 kPa).

e) The vessel should have a length-to-diameter ratio as low as is practical, and should be suitably anchored.
(Renumber all remaining sections)

SUPPLEMENT 6
PROCEDURES FOR REPAIRS OF NUCLEAR SAFETY RELATED PRESSURE RELIEF VAVLES

S6.1 SCOPE

This supplement provides procedures and requirements for the repair of nuclear safety related pressure relief valves and power actuated pressure relief valves. Nuclear safety related pressure relief valves and power actuated pressure relief valves may be repaired provided the following requirements are met. Valves being repaired under these provisions are intended to be those protecting the nuclear pressure boundary. Other pressure relief valves in the nuclear power plant (such as pressure relief valves on air compressors and auxiliary boilers) shall be repaired as required by the applicable Jurisdiction.

4.9 COMPETENCY, TRAINING AND QUALIFICATION OF PERSONNEL

4.9.1 COMPETENCY OF PERSONNEL

The repair organization shall establish the skills, knowledge, competencies, and method to evaluate competencies required for each position within the organization having direct effect on the quality of pressure relief repair performed in accordance with the Certificate of Authorization.

4.9.21 CONTENTS OF TRAINING PROGRAM

The repair organization shall establish a documented in-house training program to ensure the defined skills, knowledge and competencies are achieved. . This program shall establish training objectives and provide a method of evaluating training effectiveness. As a minimum, training objectives for each positionknowledge level shall include:

a) Applicable ASME Code and NBIC requirements;
a)b) Applicable NBIC requirements;
c) Individual responsibilities of each function described within the organization's quality system;
d) Technical aspects for the applicable position held;
e) Mechanical skills for the applicable position held;
f) Special processes as applicable listed on the Certificate of Authorization.
b) Responsibilities within the organization's quality system; and
c) Knowledge of the technical aspects and mechanical skills for the applicable position held.

4.9.32 INITIAL EVALUATION AND ACCEPTANCE QUALIFICATION OF PERSONNEL

The Each repair organization shall complete an initial evaluation and acceptance of each individual's skills and competency prior to the individual being assigned to work without direct supervision. This evaluation and acceptance shall be documented.establish minimum qualification requirements for those positions within the organization as they directly relate to pressure relief valve repair. Each repair organization shall document the evaluation and acceptance of an individual's qualification for the applicable position.

4.9.43 ANNUAL EVALUATION AND ACCEPTANCE REVIEW OF PERSONNEL QUALIFICATION

The repair organization shall complete an annual evaluation and acceptance of each individual's skills and competency to verify proficiency as well as compliance with the certificate Holder's quality system. This evaluation shall include training records, documented evidence of work performed and on-the-job observations to demonstrate competency. annually review the qualifications of repair personnel to verify proficiency as well as compliance with the Certificate Holder's quality system. This review shall include training records, docu- mented evidence of work performed, and when necessary, monitoring job performance. The review evaluation shall be documented.

Item 20-9: Request for Revision to NBIC Section 9: Glossary of terms

Parts 1, 2, 3 and 4 9.1

Purpose	Define "Verify" and “Witness” in the NBIC Part 1, 2, 3, and 4 to align with the definition in NB-263, RCI-1, Rules for Commissioned Inspectors
Scope	Add “Verify” and “Witness” to the terms defined in Section 9 of Parts 1, 2, 3 and 4
Background	The need for the definition of "verify" and “witness” was initiated from Interpretation Item 18-03, which addresses which Inspector (i.e. “IS” Commissioned or “R” Endorsement) signs the FFSA Form NB-403 when an “R” Certificate Holder is involved with a repair in that region as well as determine what level of review of the Fitness-for-Service the Inspector is expected to complete.
Proposed Revision	Verify – To determine that a particular action has been performed in accordance with the requirements either by witnessing the action or reviewing records. Witness – To be present at an event and have first-hand knowledge of the action and be able to attest that it occurred.

Submitted by: Terry Hellman

Proposed Change:

9.1 DEFINTIONS

Verify – To determine that a particular action has been performed in accordance with the requirements either by witnessing the action or reviewing records.

Witness – To be present at an event and have first-hand knowledge of the action and be able to attest that it occurred.

ITEM 20-19 Proposal

Part 4, Paragraph 3.3.3.4

l) Manual Control/Procedures

The quality system manual and referenced procedures 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 ~~and NBIC~~;

3) The title(s) of the individual(s) responsible for preparation, revision distribution, approval, and implementation of the quality system manual;

4) Provision for a controlled copy of the written quality system manual to be submitted to the National Board for acceptance prior to implementation; and

5) Revisions shall be submitted for acceptance by the National Board prior to being implemented.

Action Item Request Form

Item Number:	18-2 E. Wiggins 1-10-18
General Description:	Add verbiage regarding commissioning fired boilers & fired pressure vessels with a calibrated combustion analyzer.
Subgroup:	SG Installation

Statement of Need

Task Group: E. Wiggins (PM), D. Patten, P. Schuelke, M. Wadkinson

With the addition of requiring Carbon Monoxide (CO) detector(s) / alarm(s) the concern that the combustion equipment needs to be commissioned and potentially maintained of air/fuel ratios to meet emission requirements / limits of the manufacturer and as imposed by EPA, Area Air Quality Management District and Jurisdiction, as required.

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.

Task Group Notes:

7-17-18 TG – (EW, DP, MW, GH, Matt Downs & Bryan Ahee) reviewed the action item and following verbiage is going to be proposed:

Part of 1.6.~~9~~ 10.x Testing and Final Acceptance

All fuel fired ~~equipment~~ boiler and/or fuel fired pressure vessel combustion air~~ / ~~fuel ratios shall be analyzed, adjusted, and values documented during commissioning to meet emission requirements of the Jurisdiction and/or ~~/~~ limits of the manufacturer~~ and Jurisdiction~~, as required.

May 11th – June 13th Main Committee Letter Ballot Comments:

Mr. Marty Toth: I understand the intent of this and partially support its intent. However, I have concerns with the verbiage, its structure, and assigned placement within Part 1, Section 1.

1) I do not see anything in the proposed verbiage that mentions “calibrated combustion analyzer” as stated in the general description.

2) The proper term should read either “air-fuel” or “fuel-air”, not air/fuel to indicate fuel-to-air ratio. The use of the forward slash indicates an alternative, as used in the proposed for “requirement/limits”.

3) Since this is in conjunction with the requirement in 1.6.9 why not spell out fuel fired boilers and/or fuel fired pressure vessels. The use of “equipment” is vague and can lead to confusion or misinterpretation (though used in several locations throughout the NBIC without definition). We are addressing pressure-retaining items, not a furnace, oven, etc.

4) Within the NBIC we should concentrate on the manufacturer’s “recommendations” and Jurisdictional Authority. At least for package boilers the manufacturer requires a Start-Up Report that indicates various commissioning information item, one of which is combustion reading. If this is what we are referring to why not just state that. I personally do not think we need anything beyond that. Anything beyond that opens up confusion.

NOTE: OGA’s outside of the Jurisdictional Authority that require NOx and CO reports require them on a regular and scheduled basis, not just at start-up/commissioning, we’re talking start-up in the proposed verbiage…right?

PURPOSE: Revision of present (2017) NB-23 Code

BACKGROUND INFORMATION: Suggested revisions are supported by the contributor's 30yr industry experience within large corporate owner/user environments including purchase and design, manufacturing, installation, inspection and repair.

Part 1 - Supplement 1/Part 2 - Supplement 5

OBSERVATION: The wording of Part 1, S1.1, SCOPE and the wording of Part 2, S5.1, SCOPE serve identical purpose within the Code, but are not identically written.

RECOMMENDATION: Ensure that wording in Part 2, S5.1, is identical to that found in Part 1, S1.1.

Part 1

INSTALLATION OF YANKEE DRYERS (ROTATING ~~CAST IRON~~ PRESSURE VESSELS) WITH FINISHED SHELL OUTER SURFACES

S1.1 SCOPE

This supplement provides guidelines for the installation of a ~~Yankee~~ yankee dryer. A ~~Yankee~~ yankee dryer ~~is a pressure vessel with~~ has the following characteristics:

a) ~~This supplement describes guidelines for the installation of a Yankee dryer. A Yankee dryer~~ It is a rotating steam-pressurized cylindrical vessel commonly used in the paper industry, and ~~is typically made of cast iron,~~ finished to a high surface quality, and characterized by a center shaft connecting the heads. While traditionally made of cast iron, bolted or welded steel vessels are in use.

b) Yankee dryers are primarily used in the production of tissue-type paper products. When used to produce machine-glazed (MG) paper, the dryer is termed an MG cylinder. A wet paper web is pressed onto the finished dryer surface using one or two pressure (pressing) rolls. Paper is dried through a combination of mechanical dewatering by the pressure roll(s), thermal drying by the pressurized Yankee dryer, and a steam-heated or fuel-fired hood. After drying, the paper web is removed from the dryer.

c) A ~~Y~~yankee dryer is typically manufactured in a range of outside diameters from 8 to 23 ft. (2.4 to 7 m), widths from 8 to 28 ft. (2.4 to 8.5 m), pressurized and heated with steam up to 160 psi (1,100 kPa), and rotated at speeds up to 7,000 ft/min (2,135 m/min). Typical pressure roll loads against the Yankee dryer are up to 600 pounds per linear inch (105 kN/m). A thermal load results from the drying process due to difference in temperature between internal and external shell surfaces. The dryer has an internal system to remove steam and condensate. These vessels can weigh up to 220 tons (200 ~~tonnes~~tons).

d) The typical ~~Y~~yankee dryer is an assembly of several large ~~castings~~components. The cylindrical shell is ~~normally a gray iron casting, in accordance with~~ commonly ASME ~~designation~~ SA-278 gray cast iron, or SA-516 steel. Shells internally may be smooth bore or ribbed. Heads, center shafts, and journals may be gray cast iron, ductile cast iron, or steel.

Item 19-81

Correction to value in Table 3.7.9.1-b

Background Information: The table in question is generated using the equation in 3.7.9.1 a) 2). The values in the table are all based on the same temperatures and pressures. The only thing that changes is the volume. The ratio of the Nonpressurized Type column value to the System Volume is 0.15 in all cases except the 100 gallon case which ends up being 0.18. Thus multiplying any system volume by 0.15 should give the third column value.

Proposed Change:

TABLE 3.7.9.1-b

EXPANSION TANK CAPACITIES FOR FORCED HOT-WATER SYSTEMS

Based on average operating water temperature 195°F [91°C], fill pressure 12 psig [83 kPa], and maximum operating pressure 29 psig [200 kPa]		
Tank Capacities, gallon (l)		
System Volume	**Pressurized Diaphragm Type**	**Nonpressurized Type**
100 (379)	9 (34)	~~18 (68)~~ 15 (57)
200 (757)	17 (64)	30 (114)
300 (1136)	25 (95)	45 (170)
400 (1514)	33 (125)	60 (227)
500 (1893)	42 (159)	75 (284)
1,000 (3785)	83 (314)	150 (568)
2,000 (7571)	165 (625)	300 (1136)

Item 20-13
Expansion Tank Maximum Operating Pressure
Part 1, 3.7.9.1 a) 2) and Table 3.7.9.1-b
Submitted by: Luis Ponce – lponce@nationalboard.org

Explanation of Need:
Table 3.7.9.1-b - 30 psig matches note (a) of Table HG-709.2 of ASME Sect IV. 3.7.9.1 a) 2) The "except for prepressurized tanks" phrase is misplaced and belongs with the provisions for draining tanks. See last sentence in HG-709.2 on p. 62 and first sentence in that same section just prior to the formulas on pg. 63.

Background Information:
Prior to the 2007 Edition/2010 Addenda the table value was 30 psig. For whatever reason, it was changed to 29 psig in this issue. Prior to the 2007 Edition/2007 Addenda the paragraph read correctly.

Proposed Change:

3.7.9.1 EXPANSION TANKS AND PIPING FOR STEAM HEATING, HOT-WATER HEATING AND HOT-WATER SUPPLY BOILERS

a) Expansion Tanks for Hot-Water Heating and Hot-Water Supply Boilers

All hot-water heating systems incorporating hot-water tanks or fluid relief columns shall be so installed as to prevent freezing under normal operating conditions.

1) Heating Systems With Open Expansion Tank

An indoor overflow from the upper portion of the expansion tank shall be provided in addition to an open vent, the indoor overflow shall be carried within the building to a suitable plumbing fixture or drain.

2) Closed Heating Systems

An expansion tank shall be installed that will be consistent with the volume and capacity of the system. If the system is designed for a working pressure of 30 psig (200 kPa) or less, the tank shall be suitably designed for a minimum hydrostatic test pressure of 75 psig (520 kPa). Expansion tanks for systems designed to operate above 30 psig (200 kPa) shall be constructed in accordance with an acceptable code of construction. Provisions shall be made for draining the tank without emptying the system, except for prepressurized tanks. ~~. Except for prepressurized tanks, t~~The minimum capacity of the closed-type expansion tank should be determined from NBIC Part 1, Tables 3.7.9.1-a and 3.7.9.1-b or from the following formula where the necessary information is available:

TABLE 3.7.9.1-b
EXPANSION TANK CAPACITIES FOR FORCED HOT-WATER SYSTEMS

Based on average operating water temperature 195°F [91°C], fill pressure 12 psig [83 kPa], and maximum operating pressure ~~29~~ 30 psig [200 kPa]		
Tank Capacities, gallon (l)		
System Volume	**Pressurized Diaphragm Type**	**Nonpressurized Type**

Item 20-36

1.6.1 SUPPORTS, FOUNDATIONS, AND SETTINGS

Each boiler, potable water heater, thermal fluid heater and pressure vessel and the associated piping must be safely supported. Design of supports, foundations, and settings shall consider vibration (including seismic where necessary), movement (including thermal expansion and contraction), **grounding/bonding to minimize electrolytic corrosion** and loadings (including the weight of the fluid in the system during a pressure test) in accordance with jurisdictional requirement, manufactures recommendations, and/or other industry standards, as applicable.

Item Number: 20-42

Power Boilers (NBIC, Part 1, Section 2, Installation 2019)

2.8.4 PRESSURE CONTROL

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

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

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

c) Shutoff valves of any type shall not be placed in the steam pressure connection between the boiler and the controls described in a) and b) above. These controls shall be protected with a siphon or equivalent means of maintaining a water seal that will prevent steam from entering the control. The connections to the boiler shall not be less than NPS 1/4 (DN 8) for lengths up to and including 5 ft (1.5 m) and not less than NPS 1/2 (DN 15) for lengths over 5 ft (1.5 m) but where steel or wrought iron pipe or tubing is used, they shall not be less than NPS 1/2 (DN 15) for lengths up to and including 5 ft (1.5 m) and not less than NPS 1 (DN 25) for lengths over 5 ft (1.5 m). The minimum size of an external siphon shall be NPS 1/4 (DN 8) or 3/8 in. (10 mm) outside diameter nonferrous tubing. ~~For manifold connections, the minimum size shall be as specified in the original code of construction~~.

d) Pressure controls should have separate connections, however manifolding is permitted. When multiple pressure controls are connected to the boiler with a common manifold, the connection at the boiler up to and including the entire manifold, for pipe of nonferrous material, shall not be less than NPS 1⁄2 (DN 15) for lengths up to and including 5 ft (1.5 m) and not less than NPS 3⁄4 (DN 20) for lengths over 5 ft (1.5 m). For manifolds using ferrous material, the connection at the boiler up to and including the entire manifold shall not be less than NPS 3⁄4 (DN 20) for lengths up to and including 5 ft (1.5 m) and not less than NPS 1 1⁄4 (DN 32) for lengths over 5 ft (1.5 m). Individual controls are to be piped from the manifold according to the provisions of c) above.

Steam Heating Boilers (NBIC, Part 1, Section 3, Installation 2019)

3.8.1.4 PRESSURE CONTROL

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

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

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

c) Shutoff valves of any type shall not be placed in the steam pressure connection between the boiler and the controls described in a) and b) above. These controls shall be protected with a siphon or equivalent means of maintaining a water seal that will prevent steam from entering the control. The connections to the boiler shall not be less than NPS 1/4 (DN 8) for lengths up to and including 5 ft (1.5 m) and not less than NPS 1/2 (DN 15) for lengths over 5 ft (1.5 m) but where steel or wrought iron pipe or tubing is used, they shall not be less than NPS 1/2 (DN 15) for lengths up to and including 5 ft (1.5 m) and not less than NPS 1 (DN 25) for lengths over 5 ft (1.5 m). The minimum size of an external siphon shall be NPS 1/4 (DN 8) or 3/8 in. (10 mm) outside diameter nonferrous tubing. ~~For manifold connections, the minimum size shall be as specified in the original code of construction~~.

d) Pressure controls should have separate connections, however manifolding is permitted. When multiple pressure controls are connected to the boiler with a common manifold, the connection at the boiler up to and including the entire manifold, for pipe of nonferrous material, shall not be less than NPS 1⁄2 (DN 15) for lengths up to and including 5 ft (1.5 m) and not less than NPS 3⁄4 (DN 20) for lengths over 5 ft (1.5 m). For manifolds using ferrous material, the connection at the boiler up to and including the entire manifold shall not be less than NPS 3⁄4 (DN 20) for lengths up to and including 5 ft (1.5 m) and not less than NPS 1 1⁄4 (DN 32) for lengths over 5 ft (1.5 m). Individual controls are to be piped from the manifold according to the provisions of c) above.

Below is for reference only

(ASME CSD-1, 2018)

CW-300 PRESSURE CONTROLS

CW-310 Requirements for Pressure Controls for Steam Boilers

(a) Each boiler pressure control shall conform to UL 353, Standard for Limit Controls, and shall be accepted by a nationally recognized testing agency.

(b) Each automatically fired steam boiler or system of commonly connected steam boilers shall have at least one steam pressure control device that will shut off the fuel supply to each boiler or system of commonly connected boilers when the steam pressure reaches a preset maximum operating pressure. This requirement does not preclude the use of additional operating control devices where required.

(c) In addition to the pressure control required in (b) above, each individual automatically fired steam boiler shall have a high steam pressure limit control that will prevent generation of steam pressure greater than the maximum allowable working pressure. Functioning of this control shall cause safety shutdown and lockout. The manual reset may be incorporated in the pressure limit control. Where the reset device is separate from the pressure limit control, a means shall be provided to indicate actuation of the pressure limit control. Each limit and operating control shall have its own sensing element and operating switch.

EXCEPTION: Lockout is not required for boiler units installed in residences, as defined by the authority having jurisdiction.

(d) A pressure limit control of the automatic or manual reset type shall be electrically connected in accordance with CE-110(j).

(e) No shutoff valve of any type shall be placed in the steam pressure connection between the boiler and the high-pressure limit control device and steam pressure control device or between the boiler and steam pressure control device.

(f) Each pressure control device shall be protected with a siphon, or equivalent means of maintaining a water seal, that will prevent steam from entering the control. The minimum size of a siphon shall be NPS 1⁄4 (DN 8). Tubing suitable for the temperatures and pressures involved, with an inside diameter at least equal to standard pipe sizes, may be substituted for pipe. When a control incorporating a mercury switch is mounted on the siphon, the loop of the siphon shall be in a plane that is 90 deg (1.57 rad) from the plane of the mercury switch.

(g) Steam pressure supply connections to a single pressure control using pipe of nonferrous material shall not be less than NPS 1⁄4 (DN 8) for lengths up to and including 5 ft (1.5 m) and not less than NPS 1⁄2 (DN 15) for lengths over 5 ft (1.5 m). Tubing suitable for the temperatures and pressures involved, having an inside diameter at least equal to that of standard pipe, may be substituted for pipe.

(h) Steam pressure supply connections to a single pressure control using pipe of ferrous material shall not be less than NPS 1⁄2 (DN 15) for lengths up to and including 5 ft (1.5 m) and not less than NPS 1 (DN 25) for lengths over 5 ft (1.5 m). Tubing suitable for the temperatures and pressures involved, having an inside diameter at least equal to that of standard pipe, may be substituted for pipe.

(i) Pressure controls should have separate pressure connections; however, manifolding is permitted. When multiple controls are fed from a manifold, the manifold and common source connection to the boiler, for pipe of nonferrous material, shall not be less than NPS 1⁄2 (DN 15) for lengths up to and including 5 ft (1.5 m) and not less than NPS 3⁄4 (DN 20) for lengths over 5 ft (1.5 m). For manifolds using ferrous material, the manifold and common source connection to the boiler shall not be less than NPS 3⁄4 (DN 20) for lengths up to and including 5 ft (1.5 m) and not less than NPS 11⁄4 (DN 32) for lengths over 5 ft (1.5 m). Individual controls are to be piped from the manifold according to the provisions of (g) and (h).

(j) The upper set point limit or maximum fixed stop limit of the pressure control selected shall not exceed the maximum allowable working pressure of the boiler.

It is intended that the number be **3.8.1.7** and that the item currently **3.8.1.7** becomes **3.8.1.8**

3.8.1.7 Vacuum Boilers

Vacuum Boilers shall be provided with instruments, fittings and controls in accordance with Section 3.8 but are exempt from the following requirements if pressure and temperature controls are installed as described in 3.8.1.7 below:

3.8.1.2 Water-Gage Glasses
3.8.1.3 Water Column and Water Level Control Piping
3.8.1.4 Pressure Control
3.8.1.5 Auto Low Water Cut-Off and /or Water feeding device
3.7.7 Blow Off and Drain Valves

The exemptions are allowed only when the following controls are installed:

a) Pressure Control – Each boiler shall have a pressure control that interrupts the burner operation in response to boiler pressure. This pressure control shall be set from 2.5 psig (17 kpa) to 14.7 psig (101 kpa).
b) Temperature Control- Each boiler shall have two temperature controls responsive to boiler temperature that interrupt burner operation. One shall operate at a temperature below 210’F (99'C). The other shall at a temperature not exceeding 210'F (99'C) and shall cause a safety shutdown and lockout.
c) Safety Relief Valves - Each boiler shall have a properly sized safety valve and shall conform to the following.
    1. Have no test lever
    2. Be set to a maximum pressure of 7.1 psig (49 kpa).
    3. ASME Boiler and Pressure Vessel Code Section IV

Item 20-45

Action: look at temperature control requirements for hot water boilers between CSD-1 paragraph CW-410 and NBIC Part 1 Section 3 3.8.2.3 to determine if NBIC should add additional installation requirements.

Existing 3.8.2.3

3.8.2.3 TEMPERATURE CONTROL

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

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

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

Proposed

3.8.2.3 TEMPERATURE CONTROL

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

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

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

c) Each operating and safety limit control shall have its own sensing element and operating switch.

d) Alternatively, integrated controls with multiple sensors may be used to meet the requirements of a) and b).

Item 20-50

Existing text

2.8.2 PRESSURE GAGE

a) Each steam boiler shall have a pressure gage connected to the steam space or to the steam connection to the water column. When a pressure-reducing valve is installed in the steam supply piping, a pressure gage shall be installed on the low pressure side of the pressure-reducing valve.

b) The dial range shall not be less than 1.5 times and no greater than two times the pressure at which the lowest pressure relief valve is set.

Proposed Text

2.8.2 PRESSURE GAGE

a) Each steam boiler shall have a pressure gage connected to the steam space or to the steam connection to the water column. When a pressure-reducing valve is installed in the steam supply piping, a pressure gage shall be installed on the low pressure side of the pressure-reducing valve.

b) The dial range shall not be less than 1.5 times and no greater than approximately two times the pressure at which the lowest pressure relief valve is set.

Rational:

There is a conflict between the wording in ASME Section I and in NBIC Part I Section 2.

ASME Section I

The dial of the pressure gage shall be graduated to approximately double the pressure at which the safety valve is set, but in no case less than 1 1 /2 times the pressure.

Supplement 14
Life Extension of High Pressure Fiber Reinforced Plastic Pressure Vessels

S14.1 Scope

This document may be used to evaluate whether the service life of high pressure fiber reinforced plastic pressure vessels (FRP) can be extended for an additional lifetime. High pressure means vessels with a working pressure from 3,000 psi (20 MPa) to 15,000 psi (103 MPa). For vessels intended for cyclic service, fatigue testing of new vessels is carried out by the vessel manufacturer to be certain that the vessel will not fail in service and such testing is typically required by regulatory authorities. Fatigue design and testing is the starting point for consideration of life extension.

S14.2 General

a) The procedure for in-service testing of high pressure composite pressure vessels, **Supplement 10** herein, is incorporated by reference into this procedure for life extension of high pressure composite pressure vessels. Supplement 10 is based on acoustic emission (AE) testing, specifically modal AE (MAE) testing. The MAE inspection procedure employs detection and analysis techniques similar to those found in seismology and SONAR. Much as with earthquakes, transient acoustical impulses arise in a composite material due to the motion of sources such as the rupture of fibers. These transients propagate as waves through the material and, if properly measured and analyzed by the methods in Supplement 10, the captured waves reveal, for example, how many fibers have ruptured. Similar information about other sources is also determinable, such as the presence and size of delaminations. Delaminations can play a significant role in vessel fatigue life, particularly delaminations near the transition regions and in the heads. The rupture behavior can be used to determine the integrity of the vessel. However, the development of criteria for life extension (LE) requires an understanding of the vessel design and fatigue life.

b) Fatigue testing of out of life vessels is a crucial part of the life extension process. It is used to validate the mechanical behavior of the vessels and to develop the numerical values for the allowables in the MAE pass/fail criteria for the particular design, material and construction.

S 14.3 Life Extension Procedure

a) New vessel fatigue life testing data shall be obtained from the Manufacturer's Design Report (MDR) and the number of cycles in a lifetime shall be determined from the MDR. The type of vessel under consideration for life extension shall have been shown through testing to be capable of sustaining at least three lifetimes of cycles to developed fill pressure followed by a subsequent burst test at a pressure greater than minimum design burst pressure.

b) An evaluation of the service the vessel has seen should take into account any operational conditions that may have differed from those used in the design testing and analysis. Such conditions include for example exposure to more severe weather than expected, more cycles

per year, constant high temperature and humidity, chemical attack or any other of a number of conditions under which operations take place that were not specifically included in testing at manufacture. Any such conditions shall be listed on the attached form. If no such conditions exist, it shall be so noted on the form. The test program delineated herein shall be revised to reflect the modified conditions as documented by the user and submitted for approval to the proper authorities.

c) Data and records for all vessels considered for life extension shall be kept and made readily available to inspectors or examination personnel. This includes an operating log, number of operating cycles since the previous examination, total number of operating cycles, examinations, examination techniques and results, maximum operating pressure and any unexpected pressures, temperatures, temperature cycles, damage events or other significant events that were outside the intended operating parameters or conditions.

d) A life extension test program shall be carried out for each type of vessel under consideration. Type of vessel means the particular manufacturer, materials (fiber and resin), water volume and design. If the type of vessel passes all requirements, then that type shall be eligible for life extension testing. If such a vessel passes the life extension MAE test its lifetime can be extended for one additional lifetime in five-year increments. In order to maintain life extension a vessel must be requalified every five years using the MAE test.

S14.4 Life Extension Test Program

a) The type of vessel under consideration for LE shall be noted. Manufacturer, place of manufacture and manufacturing date shall be recorded. The vessel dimensions shall be recorded. The specific fiber, matrix and winding pattern shall be recorded. If the fiber, matrix and winding pattern are not available from the manufacturer, then a vessel of the type under consideration shall be used to verify the winding pattern (hoop and helical angles and number of plies) through destructive testing.

b) Ten out-of-life vessels of the particular type shall be tested in the manner described herein. MAE techniques shall be applied to every vessel tested. Analysis of the MAE data is described herein. Two strain gages, one in the 0-degree and one in the 90-degree direction, shall be applied to every vessel pressure tested under this program. The purpose of strain gage data is to compute the 0 and 90 modulus values and to confirm that the modulus values of the material do not vary during the fatigue cycling required herein. Strain data shall be recorded and analyzed as described later on.

c) The LE test program proceeds by Steps. If the Step 1 is not successful, then there is no need to proceed to Step 2, and so forth.

S14.5 Life Extension Test Program Steps

S14.5.1 Step 1

Three vessels shall be selected from the ten and pressurized to burst. The vessels shall be inspected for visible damage, i.e., cuts, scrapes, discolored areas, and the vessel appearance shall be documented with photographs. MAE testing shall be done in conjunction with this testing as specified in Supplement 10, except for transducer spacing, pressurization plan and accept/reject criteria values. The values in Supplement 10 are for requalification testing. The transducer spacing shall be determined by the distance at which the 400 kHz component of a suitable pulser source is detectable along the axis of the vessel (essentially across the hoop fibers) and in the perpendicular direction (essentially parallel to the hoop fibers). Detectable means that the resulting signal component has an amplitude with at least a signal to noise ratio of 1.4. Transducer frequency response calibration and energy scale shall be carried out as specified in SUPPLEMENT 10. The pressurization plan shall follow that in ASME Section X Mandatory Appendix 8, i.e., there shall be two pressure cycles to test pressure with holds at test pressure as prescribed therein, however, the time interval between the two cycles may be reduced to one minute. For the purposes of life extension, the fiber fracture energy and BEO (background energy oscillation) values shall be as specified below.

a) No BEO greater than 2 times the quiescent energy (see Supplement 10) shall be observed up to test pressure or during pressure holds.

b) No fiber break event energy shall be greater than $24 \times 10^3 \times U_{FB}$ (see Supplement 10) during the second pressurization cycle.

c) No single event shall have an energy greater than $24 \times 10^5 \times U_{FB}$ during the second pressurization cycle.

Note: The numerical values specified in b) and c) can be adjusted through documented testing and stress analysis methods in order to account for the particular design, material and construction.

d) At least two sensors shall remain on each vessel all the way to burst in order to establish the BEO pressure for this type of vessel.

e) Plots of stress versus strain shall show linear behavior up to 90% of burst pressure.

f) The burst pressures of all three vessels shall be greater than the minimum design burst pressure.

g) If the burst pressure of any one of the three vessels is not greater than the minimum design burst pressure, then these vessels shall not be eligible for life extension and there is no need to proceed with Step 2 below.

Note: It is possible that one or more of the vessels selected had damage not obvious to visual inspection. If during this burst testing phase the MAE test identifies a vessel as damaged, the substitution of three other randomly selected vessels is allowed.

S14.5.2 Step 2

If the vessels pass Step 1, fatigue testing shall be carried out on a minimum of three vessels of the same type being considered for life extension.

a) Prior to testing, the vessels shall be inspected for visible damage, i.e., cuts, scrapes, discolored areas, and the vessel appearance shall be documented with photographs.

b) Prior to fatigue testing, MAE testing as specified in Step 1 shall be done in conjunction with the fatigue testing, hereinafter called the MAE test or MAE testing, in order to determine the suitability of the vessels for fatigue testing, i.e., that they pass the MAE test.

c) Next, the vessels shall be subjected to fatigue cycles. Pressure shall be 100 psi +0, -50% to at least 1.05 x working pressure. Vessels shall survive one and one-half (1.5) additional lifetimes. If they survive then they shall be tested by an MAE test as was done prior to fatigue cycling.

d) Provided they pass the MAE test, they shall be burst tested. At least two sensors shall remain on each vessel all the way to burst in order to establish that the BEO (background energy oscillation) pressure for the fatigued vessels is consistent, i.e., is the same percentage of ultimate, with that of the vessels tested in Step 1.

e) Plots of stress versus strain shall show linear behavior up to 90% of burst pressure.

f) The burst pressures at the end of the fatigue testing shall be greater than or equal to the minimum design burst. If the burst pressure of any one of the three vessels is not greater than the minimum design burst pressure, then these vessels shall not be eligible for life extension.

S14.5.3 Step 3

If the vessels pass Step 2, impact testing shall be carried out on a minimum of three vessels of the same type being considered for life extension.

a) Prior to testing, the vessels shall be inspected for visible damage, i.e., cuts, scrapes, discolored areas, and the vessel appearance shall be documented with photographs. Prior to impact testing, MAE testing shall be done in order to determine the suitability of the vessels for impact testing, i.e., that they pass the MAE test.

b) Two vessels shall be subjected to an ISO 11119.2 drop test and then subjected to the MAE test.

If they pass the MAE test, then one vessel shall be burst tested. At least two sensors shall remain on the vessel all the way to burst in order to establish that the BEO (background energy oscillation) pressure for the fatigued vessels is consistent, i.e., is the same percentage of ultimate, with that of the vessels tested in Step 1.

c) Plots of stress versus strain shall show linear behavior up to 90% of burst pressure.

d) If the burst pressure is not greater than the minimum design burst pressure, then these vessels shall not be eligible for life extension.

e) If the first vessel passes the burst test, the other dropped vessel shall be fatigue cycled and subsequently subjected to the MAE test and, if it passes, shall be burst tested under the same conditions as before. If the vessel fails during fatigue cycling, i.e., bursts or leaks, then these vessels shall not be eligible for life extension.

f) If the modulus changes by more than 10%, then these vessels shall not be eligible for life extension. The strain gages should be mounted in a location that is away from the impact zone.

g) The burst pressure at the end of the fatigue testing of the dropped vessel shall be greater than or equal to the minimum design burst. The vessels shall have MAE testing applied during burst testing as before and the BEO shall be consistent with the previously established percent of burst ±10%.

S14.5.4 Step 4

If the vessels pass Step 3, cut testing shall be carried out on a minimum of two vessels of the same type being considered for life extension.

a) Prior to testing, the vessels shall be inspected for visible damage, i.e., cuts, scrapes, discolored areas, and the vessel appearance shall be documented with photographs. Prior to cut testing, MAE testing shall be done in order to determine the suitability of the vessels for cut testing, i.e., that they pass the MAE test.

b) Two vessels shall be subjected to an ISO 11119.2 cut test and then subjected to the MAE test. If they pass, then one shall be burst tested under all the conditions and procedures delineated in Step 2. If the burst pressure is not greater than the minimum design burst pressure, then these vessels shall not be eligible for life extension.

c) If the cut vessel passes, then the other cut vessel shall be fatigue cycled as described in Step 2 and subsequently subjected to the MAE test and then burst tested with at least two MAE sensors remaining on and monitoring the vessel as before. If it does not survive fatigue cycling, then these vessels shall not be eligible for life extension.

d) The burst pressure at the end of the fatigue testing of the cut vessel shall be greater than or equal to the minimum burst pressure specified by ISO 11119.2.

If the vessel type passes Steps 1 to 4, then that type is eligible for life extension. An out of life vessel of the type subjected to the program above may have its life extended for one additional lifetime if it passes the MAE test. The vessel shall pass the MAE test at subsequent five-year intervals or at one-third of the lifetime, whichever is less, in order to continue in service. The vessel shall be labeled as having passed the NBIC life extension test.

1.6 CHANGE OF SERVICE

Supplement 9 of this part provides requirements and guidelines to be followed when a change of service or service type is made to a pressure-retaining item.

Whenever there is a change of service, the Jurisdiction where the pressure-retaining item is to be operated, shall be notified for acceptance, when applicable. Any specific jurisdictional requirements shall be met.

1.7 SCRAPPING PRESSURE RETAINING ITEMS

The owner or user shall deface the code nameplate(s) of any pressure retaining item that is scrapped. The removal or defacement of the Code nameplate(s) should be verified by the Inspector, and the National Board form NB-XXX shall be completed and submitted to the National Board and Jurisdiction, if required.

ADD DEFINITION:

SCRAPPED – Permanent removal from service by owner's or user's procedures.

Scrapping of Pressure Retaining Items

In accordance with provisions of the National Board Inspection Code

1.Submitted to:

Name of Jurisdiction

Address

Phone Number

2. Submitted by:

(Name of Owner/User)

Address

Phone Number

3. Manufactured by:
(name and address)

4. Location of Installation:
(address)

5. Manufacturer's Data Report: ☐ YES ☐ NO

6. Item Registered with National Board: ☐ YES ☐ NO NB Number: _____

7. Item Identification:

Year Built: _____ Mfr. Serial No.: _____

Type: _____ Jurisdiction no.: _____

Dimensions: _____ MAWP: _____

8. Date of removal or defacement of the Code nameplate(s) _____

9. I certify that to the best of my knowledge and belief the statements in this report are correct, and with provisions of the National Board Inspection Code.

Name of Owner or User: _____

Signature: _____ Date: _____

Instructions for Completing the Form NB-XXX, *Scrapping of Pressure Retaining Items Form*

Items 1-9 shall be completed by the owner, user, or "R" Stamp Holder making the request.

1) The name, address, and phone number of the Jurisdiction, Authorized Inspection Agency (when there is no Jurisdiction) the form is being submitted to for approval.
2) Enter the name and address of your company or organization.
3) Enter the name and address of the manufacturer shown on the name plate.
4) Enter the name and address of the location where the pressure-retaining item is installed. If this is the same as number 2, check the box "same as # 4."
5) Manufacturer's Data Report Attached-check the appropriate box.
6) Is the pressure-retaining item registered with the National Board? Check the appropriate box. If yes, provide the National Board Registration Number.
7) Provide as much information as known to help identify the pressure-retaining item.
8) Enter date the removal or defacement of the Code nameplate.
9) Enter the name and signature of the owner, user, or "R" Stamp Holder (and "R" Stamp number if applicable).

Note: Once completed the requester shall file a copy with the Jurisdiction where the pressure retaining item is installed, the National Board (if registered with the National Board), and the owner or user of the vessel if the request was made by an "R" Stamp Holder, and upon request to the Authorized Inspection Agency who witnessed the removal or defacement of the nameplate.

1.4.1 PERSONAL SAFETY REQUIREMENTS FOR ENTERING CONFINED SPACES

a) No pressure-retaining item shall be entered until it has been properly prepared for inspection. The owner or user and Inspector shall jointly determine that pressure-retaining items may be entered safely.

This shall include:

1) Recognized hazards associated with entry into the object have been identified by the owner or user and are brought to the attention of the Inspector, along with acceptable means or methods for eliminating or minimizing each of the hazards;

2) Coordination of entry into the object by the Inspector and owner or user representative(s) working in or near the object;

3) Personal protective equipment required to enter an object shall be used. This may include, among other items, protective outer clothing, gloves, respiratory protection, eye protection, foot protection, and safety harnesses. The Inspector shall have the proper training governing the selection and use of any personal protective clothing and equipment necessary to safely perform each inspection. Particular attention shall be afforded respiratory protection if the testing of the atmosphere of the object reveals any hazards;

4) Completing and posting of confined space entry permits, as applicable; and

5) An effective energy isolation program (lock out and/or tag out) is in place and in effect that will prevent the unexpected energizing, start-up, or release of stored energy.

b) The Inspector shall determine that a safe atmosphere exists before entering the pressure-retaining item. The atmosphere shall be verified by the owner or user as directed by the Inspector.

1) The oxygen content of the breathable atmosphere shall be between 19.5% and 23.5%.

2) If any flammable or combustible materials are present in the atmosphere they shall not exceed 10% of their Lower Explosive Limit (LEL) or Lower Flammable Limit (LFL).

3) The Inspector shall not enter an area if toxic, flammable or inert gases, vapors or dusts are present and above acceptable limits.

c) Remote visual inspection is an acceptable alternative to confined space entry provided the requirements of 4.2.1 c) are met and where allowed by the jurisdiction.

1.4.2 EQUIPMENT OPERATION

The Inspector shall not operate owner or user equipment. Operation shall be conducted only by competent owner or user employees familiar with the equipment and qualified to perform such tasks.

4.1 SCOPE

This section describes acceptable examination and test methods that are available to the Inspector during inspection of pressure-retaining items. This section also describes evaluation of test results and assessment methodologies.

4.2 NONDESTRUCTIVE EXAMINATION METHODS (NDE)

a) Listed below is a variety of nondestructive examination methods that may be employed to assess the condition of pressure-retaining items. The skill, experience, and integrity of the personnel performing these examinations are essential to obtain meaningful results. The Inspector should review the methods and procedures to be employed to ensure compliance with jurisdictional requirements.

b) Generally, some form of surface preparation will be required prior to use of these examination methods. When there is doubt as to the extent of a defect or detrimental condition found in a pressure-retaining item, the Inspector is cautioned to seek competent technical advice and supplemental NDE.

c) Personnel performing examination and test methods shall have proper training and certification, as required by the owner and acceptable to the Inspector and Jurisdiction, if required.

4.2.1 VISUAL

a) Visual examination is the basic method used when conducting an inservice inspection of pressure-retaining items. Additional examination and test methods may be required at the discretion of the Inspector to provide additional information to assess the condition of the pressure-retaining item.

b) Visual examination is an inspection method to ascertain the surface condition of the pressure-retaining item. The Inspector should be aware of recognizing various surface features and comparing these features with damage mechanisms listed in NBIC Part 2, Section 3 that could indicate exposure of the pressure-retaining item to harmful corrosion or elevated temperature service.

c) ~~In some cases the Inspector may have limited or no access while performing an inspection of the pressure-retaining item. Subject to approval of the Jurisdiction, remote camera or fiber optic devices may be considered acceptable methods to view and record the surface condition of the pressure-retaining item.~~Remote Visual Inspection is an acceptable method of visual examination if the process is agreed upon by the owner and acceptable to the Inspector and Jurisdiction, if required.

1) For Remote Visual Inspection, plans are reviewed and approved by the Inspector.
2) The Inspector shall be present at time of data collection.
3) The Inspector will be provided a dedicated monitor that has a resolution at least equal to that obtainable by direct observation, care should be taken to minimize glare on the viewing screen.
4) The Inspector shall have direct communication with the operator of the remote visual camera.
5) For Remote Visual Inspections, the final report is acceptable to the Inspector / Jurisdiction and all raw data is available to the Inspector / Jurisdiction as needed.

6) For Remote Visual Inspections, the inspection procedure shall reference a validated qualification of the equipment, including verification that the equipment is safe for use in the environment it will be operating in. Equipment validation will refer to ASME BPVC Section V. As a minimum the equipment shall meet:

a. 1/32" (0.8 mm) simulated defect identification
b. Minimum light intensity of 100 fc (1086 lux)
c. Not less than 30deg offset to the surface to be examined
d. Resolution at least equal to that obtainable by direct observation

7) All equipment used must produce results acceptable to the Inspector.

~~COLOR CODES:~~

~~Yellow~~	~~Items proposed (mostly by Mr. Reimers) and accepted for NBIC ballot~~
~~Green~~	~~Additional recommended by PVHO for consideration for inclusion in the July NBIC meeting~~
~~Cyan~~	~~Items still requiring discussion.~~

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

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

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

a) General/operational

1) PVHOs should be constructed in accordance with ASME PVHO-1. This code adopts Section VIII and therefore the vessels should bear a "U" or "U2" ASME designator. Inspections may be conducted using ASME PVHO-2 for reference. ASME PVHO-1 also has several Cases that address PHVOs manufactured from non-traditional materials such as various fabrics. PVHOs built under such cases shall have all the documentation required by the Case, but may not necessarily have any related Section VIII forms.

2) Cast and ductile iron fittings are not allowed.

~~3) Due to the human occupancy element, a person should be in attendance to monitor the PVHO when in operation, in the event there is an accident emergency or personnel inside the PVHO require assistance.~~

~~4)~~3) The installation should be such that there is adequate clearance to inspect it properly. In some applications, such as underground tunneling, it may be impossible to perform a complete external inspection.

b) Internal Inspection

1) Where existing openings permit, perform a visual internal inspection of the vessel. Look for any
obvious cracks and note areas that are subject to high stress such as welds, welded repairs, head-to-shell transitions, sharp interior corners, and interior surfaces opposite external attachments or supports.
2) The vessel should be fee of corrosion, damage, dents, gouges, or other damage. Special attention should be paid to areas under chamber floors and the interiors of chamber drain fittings.
3) All openings leading to external fittings or controls should be free from obstruction

4) All exhaust inlets should be checked for the presence of fittings that prevent a chamber occupant from inadvertently blocking the opening.
5) The inlets to all chamber pressure gauge lines should be located where they are either protected from possible blockage or fitted with multiple openings.
6) Chamber doors:
    a. Doors should operate freely and smoothly. However, doors designed to move/swing horizontally should not have so little hinge friction that they will move on their own when released.
    b. Doors that close/seal with pressure and which are fitted with "dogs" or other restraints to hold them in place until an initial seal is obtained, shall be ~~fitted~~ provided with features to prevent the door from maintaining a seal in the event the pressure differential on the door is reversed to an extent sufficient to overload the restraints.
    c. Door seals should be supple, free from flat spots, cracking, etc.
    d. Doors that close/seal against pressure shall have provisions as follow:
        1. Positive protection against pressurization of the vessel unless the restraint mechanism is fully engaged. This includes pressurization by back-up methods as well as primary methods.
        2. Positive protection against release of the restraint mechanism unless pressure in the vessel is fully released

c) External Inspection
1) The Inspector should closely examine the external condition of the pressure vessel for corrosion, ~~damage,~~ dents, gouges or other damage.
2) The lower half and the bottom portions of insulated vessels should receive special focus, as condensation or moisture may gravitate down the vessel shell and soak into the insulation, keeping it moist for long periods of time. Penetration locations in the insulation or fireproofing such as saddle supports, sphere support legs, nozzles, or fittings should be examined closely for potential moisture ingress ~~paths~~. When moisture penetrates the insulation, the insulation may actually work in reverse, holding moisture in the insulation and/or near the vessel shell.
~~3) Insulated vessels that are run on an intermittent basis or that have been out of service require close scrutiny. In general, a visual inspection of the vessel's insulated surfaces should be conducted once per year.~~
~~4)~~3) The most common and superior method to inspect for suspected corrosion under insulation (CUI) damage is to completely or partially remove the insulation for visual inspection. The method most commonly utilized to inspect for CUI without insulation removal is by X-ray and isotope radiography (film or digital) or by real time radiography, utilizing imaging scopes and surface profilers. The real time imaging tools will work well if the vessel geometry and insulation thickness allows. Other less common methods to detect CUI include specialized electromagnetic methods (pulsed eddy current and electromagnetic waves) and long-range ultrasonic techniques (guided waves).
~~5)~~4) There are also several methods to detect moisture soaked insulation, which is often the beginning for potential CUI damage. Moisture probe detectors, neutron backscatter, and thermography are tools that can be used for CUI moisture screening. Proper surface treatment (coating) of the vessel external shell and maintaining weather-tight external insulation are the keys to prevention of CUI damage.
~~6)~~5) Couplers and doors that open with pressure:
    a. Couplers and doors should operate freely and smoothly.

b. Seals should be supple, and free from flat spots, cracking, etc.
c. That close/seal against pressure shall have provisions as follow:
    1. Positive protection against pressurization of the vessel unless the restraint mechanism is fully engaged. This includes pressurization by back-up methods as well as primary methods
    2. Positive protection against release of the restraint mechanism unless pressure in the vessel is fully released

d) Inspection of parts and appurtenances (e.g., piping systems, pressure gages, bottom drains, etc.)

1) As stated above, cast iron is not allowed on PVHOs and shall be replaced with parts fabricated with other suitable materials, in accordance with ASME Code Section II.
2) If valves or fittings are in place, check to ensure that these are complete and functional.
3) The Inspector shall note the pressure indicated by the gage and compare it with other gages on the same system. If the pressure gage is not mounted on the vessel itself, it should be ascertained that the gage is installed on the system in such a manner that it correctly indicates actual pressure in the vessel. Lines leading to chamber primary depth gauges should connect only to the depth gauge.
4) The Inspector shall verify that ~~the~~ any vessel is provided with a drain opening.
5) The system should have a pressure gage designed for at least the most severe condition of pressure in normal operation. This gage should be clearly visible to the person adjusting the setting of the pressure control valve. The graduation on the pressure gage shall be graduated to not less than 1.5 times the pressure at which the lowest safety/relief valve is set.
6) Provisions should be made to calibrate pressure gages or to have them checked against a standard test gage.
7) ~~Any vents and exhausts~~ The exhausts from the depressurization of PVHOs located inside enclosures should be piped to a location outside the enclosure and located at least 10 ft. (3.0 m) away from any air intake.
~~8) Low points should be fitted with drains.~~

e) Inspection of view ports / windows

1) Each window should be individually identified and be marked in accordance with ASME PVHO-1.
2) If there are any penetrations through windows, they must be circular and in accordance with ASME PVHO-1 requirements.
3) Windows must be free of crazing, cracks and scratches that exceed "superficial" defects as defined by ASME PVHO-2.
4) Windows and viewports have a maximum interval for seat/seal inspection and refurbishment.
5) Windows have a maximum service life ranging from 10 to 20 years depending on the type of window and service conditions.
~~4)~~6) Documentation should be checked to ensure compliance with PVHO-2 inspection and refurbishment requirements (ASME PVHO-2-2016, Tables 2-4.3-1 and 2-4.3-2) and service life limitations (ASME PVHO-2-2016, Section 2-4.4).

f) Inspection of pressure relief devices

1) Pressure relief devices for chambers only must have a quick opening manual shutoff valve installed between the chamber and the pressure relief device, with a frangible seal in place, within easy access to the operator.

2) The pressure relief device shall be constructed in accordance with ASME Code Section VIII.
3) The discharge from the chamber pressure relief device shall be piped outside to a safe point of discharge as determined by the AHJ (Authority having Jurisdiction). The discharge from other relief devices shall to be piped outside only if they are on systems that carry non-life supporting gases.
4) ~~Rupture disks may be used only if they are in series with a pressure relief valve, or when there is less than 2 ft³ (57 l) of water volume.~~ Rupture disks shall not be used, except in series upstream of pressure relief valves to prevent gas leakage.
5) Verify that the safety valve is periodically tested either manually by raising the disk from the seat or by removing and testing the valve on a test stand.

g) Acceptance criteria

The following forms are required to be available for review ~~completed~~:
1) ASME BPV Forms U-1, U-1A or U-2 as appropriate for vessels built to ASME B&PV Code Section VIII. For vessels built to other rule sets, the equivalent forms shall be available;
2) ASME PVHO-1-2016 Form GR-1 Manufacturer's Data Report for Pressure Vessels for Human Occupancy;
3) ASME PVHO-1-2016 Forms VP-1 ~~PVHO-2~~ Fabrication Certification for Acrylic Windows (one for each window);
4) ASME PVHO-1-2016 Form VP-2 Design Certification for Acrylic Windows (one for each window);
5) ASME PVHO-2-2016 Form VP-1 Viewport Inspection (one for each window, current within ASME PVHO-2 inspection interval requirements); and
6) For any repaired windows, ASME PVHO-2-2016 Form VP-2 Acrylic Window Repair Certificate for Windows Repaired by the Use (or his Authorized Agent) OR ASME PVHO-2-2016 Form VP-3 Acrylic Window Repair Certificate for Severely Damage Windows

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

2.3.6.5 INSPECTION OF PRESSURE VESSELS FOR HUMAN OCCUPANCY (PVHO'S)

d) Inspection of parts and appurtenances (e.g., piping systems, pressure gage, bottom drain)

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

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

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

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

5) The system should have a pressure gage designed for ~~at least~~ the most severe condition of ~~coincident~~ pressure in normal operation. This gage should be clearly visible to the person adjusting the setting of the pressure control valve. The graduation on the pressure gage shall be graduated to not less than 1.5 times the pressure at which the lowest safety/relief valve is set.~~MAWP of the vessel.~~

6) Provisions should be made to calibrate pressure gages or to have them checked against a standard test gage.

7) Any vents and exhausts should be piped at least 10 ft. (3.0 m) from any air intake.

8) Low points should be fitted with drains.

Action Item Request Form

CODE REVISIONS OR ADDITIONS

Request for Code revisions or additions shall provide the following:

a) Proposed Revisions or Additions

Item Number: 19-22.

b) Existing Text:

None

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

No existing text to instruct inspectors on rating return-flue (Scotch Marine) historical boilers. Add section S2.10.3.1 and table for constant values. Update S2.10.6 Nomenclature

c) Background Information

An extensive review of all code and pre-code equations has been made:

1.) ASME equations from 1914-1971 editions are simple but the steps to determine the choice of equations is complex in nature, and examples exist where engineers did not correctly interpret the steps or equations. Design criteria may not match construction on pre-code boilers, and construction may hide details needed for a field inspector to choose the appropriate equation. These equations typically grant the highest calculated MAWP which may or not be appropriate for pre-code boilers with unknown material or non-compliant designs.

2.) The Canadian Interprovincial Regulations define a set of simple equations, but do not consider tensile strength. These equations were first enforced in 1910, then deprecated in favour of ASME wording in the 1920's, presumably in efforts to harmonize aspects of the two standards.

49.—Internally Fired Furnaces or Parts of Boilers (other than Ordinary Fire Tubes) Subjected to Compression.

The furnace plates in plain circular internally fired furnaces, not exceeding 42 inches in diameter if not found sufficiently strong, must be stayed as flat surfaces, allowing in the calculations for such seventy-five per cent. (75%) of the value of the resistance to collapse, as found by the following formula, the pitch of the stays being computed by the rule for flat surfaces, but the pitch shall in no case exceed eight inches on the furnace plate. For furnaces over forty-two inches in diameter, no allowance for value of resistance to collapse shall be made. Care must be taken not to reduce the efficiency of the riveted joint when applying these stays.

$$B = \frac{C \times T^2}{(L_1 + 1)\,Dr}$$

Where—

Dr = Outside diameter of furnace in inches.

T = Thickness of plate in inches.

L_1 = Length of furnace in feet, or length between rings.

C = Constant according to the following circumstances:

B = Working pressure per square inch, which must not exceed that found by the limiting formula, as follows:

50

$$B = \frac{10000 \times T}{Dr}$$

Furnaces with butt joints and rivet holes punched small and reamed out in place.

112500 where the longitudinal seams are double riveted, and fitted with single butt straps.

100000 where the longitudinal seam is single riveted, and fitted with single butt strap.

112500 where the longitudinal seam is single riveted, and fitted with double butt straps, or where seam is welded.

Furnaces with lap joints and rivet holes punched small and reamed out in place.

96000 where the longitudinal seams are double riveted.

87500 where the longitudinal seams are single riveted.

3.) The British Board of Trade rule (circa 1880) is a precursor to the Canadian regulations. The equation is of the same form, but assumed different materials. It is only appropriate for wrought iron boilerplate. It is clear that this equation was heavily researched and heavily enforced because other formulas were “dangerously weak”.

“Circular furnaces with the longitudinal joints welded or made with a butt strap:

$$\frac{\text{90,000} \times \text{the square of the thickness of the plate in inches.}}{(\text{Length in feet} + 1) \times \text{diameter in inches}} = \text{the working}$$

pressure per square inch, provided it does not exceed that found by the following formula:

$$\frac{\text{8,000} \times \text{thickness in inches}}{\text{diameter in inches.}} = \text{Working pressure per square inch.}$$

The second formula limits the crushing stress to 4000 lbs. per sectional square inch.

The length is to be measured between the rings if the furnace is made with rings.

If the longitudinal joints instead of being butted are lap jointed in the ordinary way then 70,000 is to be used instead of 90,000, excepting only where the lap is bevelled and so made as to give the flues the form of a true circle, when 80,000 may be used.

When the material or the workmanship is not of the best quality, the constants given above must be reduced, that is to say, the 90,000 will become 80,000; the 80,000 will become 70,000; the 70,000 will become 60,000; when tke material and the workmanship are not of the best quality, such constants will require to be further reduced, according to circumstances and the judgment of the surveyor, as in the case of old boilers. One of the conditions of best workmanship is that the joints are either

double rivetted with single butt straps, or single rivetted with double butt straps, and the holes drilled after the bending is done and when in place, and the plates afterwards taken apart, the burr on the holes taken off, and the holes slightly countersunk from the outside *

* The following examples will serve to show the application of the constants for the different cases that may arise:

Furnaces with butt joints and drilled rivet holes.	90,000 where the longitudinal seams are welded. 90,000 where the longitudinal seams are double rivetted and fitted with single butt straps. 80,000 where the longitudinal seams are single rivetted and fitted with single butt straps. 90,000 where the longitudinal seams are single rivetted and fitted with double butt straps.
Furnaces with butt joints and punched rivet holes.	85,000 where the longitudinal seams are double rivetted and fitted with single butt straps. 75,000 where the longitudinal seams are single rivetted and fitted with single butt straps. 85,000 where the longitudinal seams are single rivetted and fitted with double butt straps.
Furnaces with lapped joints and drilled rivet holes.	80,000 where the longitudinal seams are double rivetted and bevelled. 75,000 " " " " " " " and not bevelled. 70,000 " " " " " single " and bevelled. 65,000 " " " " " " and not bevelled.
Furnaces with lapped joints and punched rivet holes.	75,000 where the longitudinal seams are double rivetted and bevelled. 70,000 " " " " " " " and not bevelled. 65,000 " " " " " single " and bevelled. 60,000 " " " " " " " and not bevelled.

In the case of upright fire-boxes of donkey or similar boilers, 10 per cent. should be deducted from the constants given above, applicable to the respective classes of work.

4.) Lloyds Rule (circa 1870) is a precursor to the British Board of Trade rules, derived from research by Sir William Fairbairn. It was deemed incorrect by the British Board of Trade for determining collapsing pressure of large cylinders. For the firetube dimensions it was intended for, this equation applied a 4.5:1 factor of safety. Thus, this equation is not a suitable candidate.

5.) Modern ASME equations assume modern materials and welded construction. Compensation for the length of the tube is inappropriate for riveted construction.

6.) Other research and equations, generally from the mid 1800's through early 1900's, were investigated and documented but not evaluated because it is clear that the equations predate any current knowledge or definition of safety factors. Note that in the USA there was no known accepted standard equation for external pressures on cylindrical surfaces. In fact, one extensive study in 1896 did not provide any equation for USA boilers.

This proposal derives an equation based on the Canadian and British Board of Trade regulations. With both forms of the equation, it is possible to derive a new equation that requires material tensile strength. The calculated MAWP results are generally more conservative than ASME equations, which may be acceptable when ASME design criteria may

not be met, and when thickness readings are based from sampling of deteriorated plate, not new construction with uncorroded, new, material.

S2.6.2 ULTRASONIC THICKNESS TESTING

Ultrasonic thickness (UT) testing shall be performed to determine boiler plate thickness. UT testing shall be performed by personnel acceptable to the Jurisdiction and the Inspector. The following requirements shall be met, to the extent possible. Performance and results shall be acceptable to the Inspector and, if required, the Jurisdiction.

a) Equipment, operator, and calibration standards used shall be documented.
b) On initial UT of stayed sections, the plate thickness readings should be taken on a grid not exceeding the maximum staybolt pitch. Additional readings may be taken close to each staybolt to determine if localized thinning has occurred. Particular attention should be given to the joint between the staybolt and the plate.
c) On initial UT of unstayed sections, the plate thickness readings should be taken on a grid not exceeding 12 inch (300mm) centers. Additional readings should be taken if conditions warrant.
d) UT test results shall be documented so location of test results can be checked at subsequent UT tests to determine if material loss has occurred.
e) Recurring UT testing shall be performed by randomly checking 10% of original UT checks. Areas of thinning identified during previous inspections shall be given particular attention. If material loss is determined, additional testing may be requested by the Inspector.
f) Particular attention should be placed upon areas that typically exhibit thinning. These areas include the ogee curve, the mudlegs, the fusible plug, around feedwater inlets, and around the firebox door ring.
g) The owner/operator shall maintain the initial and recurring grid mapped UT readings in conjunction with the calculations in permanent boiler records. Documentation shall be available to the Inspector for review and acceptance.
h) Unstayed plain circular cylindrical components under external pressure shall require readings performed on a grid not exceeding 9 inch centers. Additional readings should be taken if conditions warrant.

S2.10.3.1 Cylindrical Components Under External Pressure

The MAWP of unstayed plain circular cylindrical components not exceeding 42 inches in diameter and under external pressure shall be determined by the strength of the weakest course computed from the minimum thickness of the plate, the tensile strength of the plate, the type of longitudinal joint, outside diameter of the weakest course, and the length of the firetube, using the following formulas:

$$P_1 = \frac{C_1 \times t^2 \times TS}{\left(\frac{f}{12} + 1\right) \times d_o}$$

$$P_2 = \frac{t \times TS}{C_2 \times d_o}$$

$$P = min(P_1, P_2)$$

TABLE S2.10.3.1

CONSTANTS FOR CALCULATED MAWP FOR CYLINDRICAL COMPONENTS UNDER EXTERNAL PRESSURE

Constant Values		
C_1	Longitudinal Joint	
	1-row lap seam	1.85
	2-row lap seam	1.95
	1-row butt strap, single butt strap	2.1
	1-row butt strap, double butt strap	2.2
	2-row butt strap, single butt strap	2.2
	2-row butt strap, double butt strap	2.3
	Forge welded	2.3
C_2		5.0

Example 1: Vertical boiler with an unstayed steel firebox with an outside diameter of 34 inches, height of 24 inches, and a thickness of 0.4 inches calculates as follows, 1-row lap seam is calculated as follows:

$$P_1 = \frac{1.85 \times 0.4^2 \times 55000}{\left(\frac{24}{12} + 1\right) \times 34} = 160\ PSI$$

$$P_2 = \frac{0.4 \times 55000}{5.0 \times 34} = 129\ PSI$$

$$P = min(160, 129) = 129\text{psi}$$

S2.10.6 NOMENCLATURE

p = maximum pitch measured (inches or mm) between straight lines, (horizontal, vertical, or inclined) passing through the centers of staybolts in different rows.

l = the pitch of stays in one row, passing through the center of staybolts, these lines may be horizontal, vertical, or inclined and measured in inches or mm.

w = the distance between two rows of staybolts, inches or mm.

h = the hypotenuse of a square or rectangle, defined as either $\sqrt{2p^2}$ or, $\sqrt{l^2 + w^2}$ inches or mm.

d = minimum diameter of corroded staybolt, inches or mm

R = inside radius of the weakest course of shell or drum, in inches or mm.

TS= ultimate tensile strength of shell plates, psi (MPa)

t = minimum thickness of shell plate in the weakest course, inches or mm.

P = calculated MAWP psi (MPa).

S = maximum allowable stress value, psi (MPa).

d_o = outside diameter of firetube; if tapered use the largest outside diameter.

f = length of firetube, inches, measured between circumferential joints.

C = 2.1 for welded stays or stays screwed through plates not over 7/16 in. (11 mm) in thickness with ends riveted over.

C = 2.2 for welded stays or stays screwed through plates over 7/16 in. (11 mm) in thickness with ends riveted over.

C = 2.5 for stays screwed through plates and fitted with single nuts outside of plate, or with inside and outside nuts, omitting washers.

C = 2.8 for stays with heads not less than 1.3 times the diameter of the stays screwed through plates, or made a taper fit and having the heads formed on the stays before installing them and not riveted over, said heads being made to have true bearing on the plate.

C = 3.2 for stays fitted with inside and outside nuts and outside washers where the diameter of washers is not less than 0.4p and thickness not less than t.

Note: The ends of stays fitted with nuts shall not be exposed to the direct radiant heat of the fire.

C_1 & C_2 = constants, see Table S2.10.3.1

E = the efficiency of the longitudinal riveted joint.

See Table S2.10.6 for efficiencies (E), which are the average for the different types of riveted joints.

S2.7.3.2 SUBSEQUENT INSPECTIONS

a) Boilers that have completed the initial inspection requirements begin the subsequent inspection intervals. The following inspection intervals should be used unless other requirements are mandated by the Jurisdiction.

1) Interval #1 — One year following initial inspection. Inservice inspection per NBIC Part 2, S2.7.1.
2) Interval #2 — Two years following initial inspection. Visual inspection per NBIC Part 2, S2.5.2.2.
3) Interval #3 — Three years following initial inspection. A pressure test per NBIC Part 2, S2.6.1.
~~4) Interval #4 — Same as interval #1.~~
~~5) Interval #5 — Visual inspection per NBIC Part 2, S2.5.2.2 and UT thickness testing per NBIC Part 2 S2.6.2.~~
~~6) Interval #6 — Same as interval #3.~~

b) After interval #3~~6~~ is completed, the subsequent inspection cycle continues with interval #1.

c) UT thickness testing per NBIC Part 2 S2.6.2 shall be performed at 5 year intervals, or at a shorter interval if deemed necessary by the Jurisdiction.

1) Recurring UT thickness testing may be extended by up to 1 cycle (5 years) where the owner can demonstrate the following:

a. Two prior consecutive NDE reports following this cycle, spanning a minimum of 5 years, showing that current practice permits a longer NDE cycle;

b. Storage and care of the boiler in adherence with the applicable sections of S2.13.1 STORAGE METHODS; and

c. Operating records (ie; visual images and log book records showing correct water treatment) shall be reviewed annually during the extension period indicating no change to boiler condition.

Interpretation IN19-26

Proposed Interpretation

Inquiry:	IN19-26
Source:	Doug Biggar
Subject:	NBIC Part 3 Section Part 3, 3.3.2
Edition:	[Current/all]
General Description:	Repair of none pressure boundary parts
Question 1:	If a welding repair is done to an appendage of a horizontal ASME LPG pressure vessel such as a faulty leg or the raised data plate holder, is this considered routine and are we exempt to have an inspector present to witness it and/or fill out a specialized form?
Reply 1:	No inspector needs to be present as the welding is not performed on any part of the pressure vessel directly related to its performance under pressure.
Question 2:	What is the minimum length of an appendage we can weld onto without being an ASME/NBIC certified welder (only a standard welding ticket)?
Reply 2:	1/4”
Committee’s Question 1:	Are refurbishment activities such as shot blasting, thread cleaning and painting considered within the scope of the NBIC?
Committee’s Reply 1:	No
Rationale 1:	These activities should not affect the pressure retaining integrity of the item, per the introduction to the NBIC that (maintenance) is the function of the NBIC. Reasonably these activities fall outside the scope of the NBIC
Committee’s Question 2:	Do welding activities on items which have neither a pressure retaining or load bearing function fall within the scope of the NBIC
Committee’s Reply 2:	No.
Rationale:2	These welds are such that typical ASME BPV construction codes would not dictate the qualification of the welders or welding operators.
NBIC Vote	

Include in response letter: NA

Rationale:

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

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

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

PROPOSED INTERPRETATION

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

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

PROPOSED INTERPRETATION

Inquiry No.	**20-11**
Source	Hugh-Jean Nel, Sasol Hugh-Jean.Nel@sasol.com
Subject	Scope of Repairs **Background:** Historically NBIC has not defined limitations on the scope of repair provided the entire item is being rebuilt, see Question & Reply 2 & 3 in Interpretation 98-28. NBIC Part 3 lists several examples of repair but nowhere limits the scope or amount of these examples that can be utilized when performing repairs. This creates some uncertainty when performing some types of repairs, such as replacing the tubesheets of a fixed tubesheet type heat exchanger as listed in 3.3.3 e). According to ASME BPV Code Section VIII Division 1 Part UHX, Section 13, the length of the tubes is a design parameter and therefore replacing the tubesheet in accordance with its original design might require the replacement of the tubes as well to maintain the original design length.
Edition	2019; Part: Repairs and Alterations; Section: 3; Paragraph: 3.3.3 Examples of Repairs
Question	Question: Is it permissible for repair activities performed on pressure retaining item to have more than one activity listed in 3.3.3 with the scope of repair?
Reply	Proposed Reply: Yes, ~~provided that the scope of repairs has been approved by the Inspector, and when required, by the Jurisdiction.~~
Committee's Question 1	~~Can~~ May multiple repair activities referenced in 3.3.3 of Part 3 be listed on a single Form R-1 Report when performing a repair on a pressure retaining item?
Committee's Reply	Yes
Rationale	There is nothing in the NBIC that restrict the repair work performed on one vessel at the same time.
Committee's Question 2	Other than tube plugging, ~~I~~is it considered an alteration when the heat transfer surface(s)~~tube length~~ of a heat exchanger is ~~changed~~ changed from its original design~~while replacing tube sheets~~ on a ~~ASME~~ ~~Section VIII, Div 1~~ pressure vessel?
Committee's Reply	Yes~~.~~ Reference NBIC Part 3,. 3.4.4 d)
Rationale:	~~The tube length is a dimension as mentioned in 3.4.4. d~~

Interp 20-11

3.4.4 EXAMPLES OF ALTERATIONS

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

3.3.3 EXAMPLES OF REPAIRS

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

INTERPRETATION 98-28

Subject: RC-1050(c) Replacement Parts Fabricated by an "R" Certificate Holder
Appendix 6 Pressure Retaining Replacement Items
RC-1050 Definition of New Replacement Parts

1998 Edition

Question 1: Does RC-1050(c) of the NBIC permit the holder of an "R" Certificate to fabricate by welding new and exact pressure retaining replacement parts for an ASME stamped item that the "R" stamp holder is repairing?

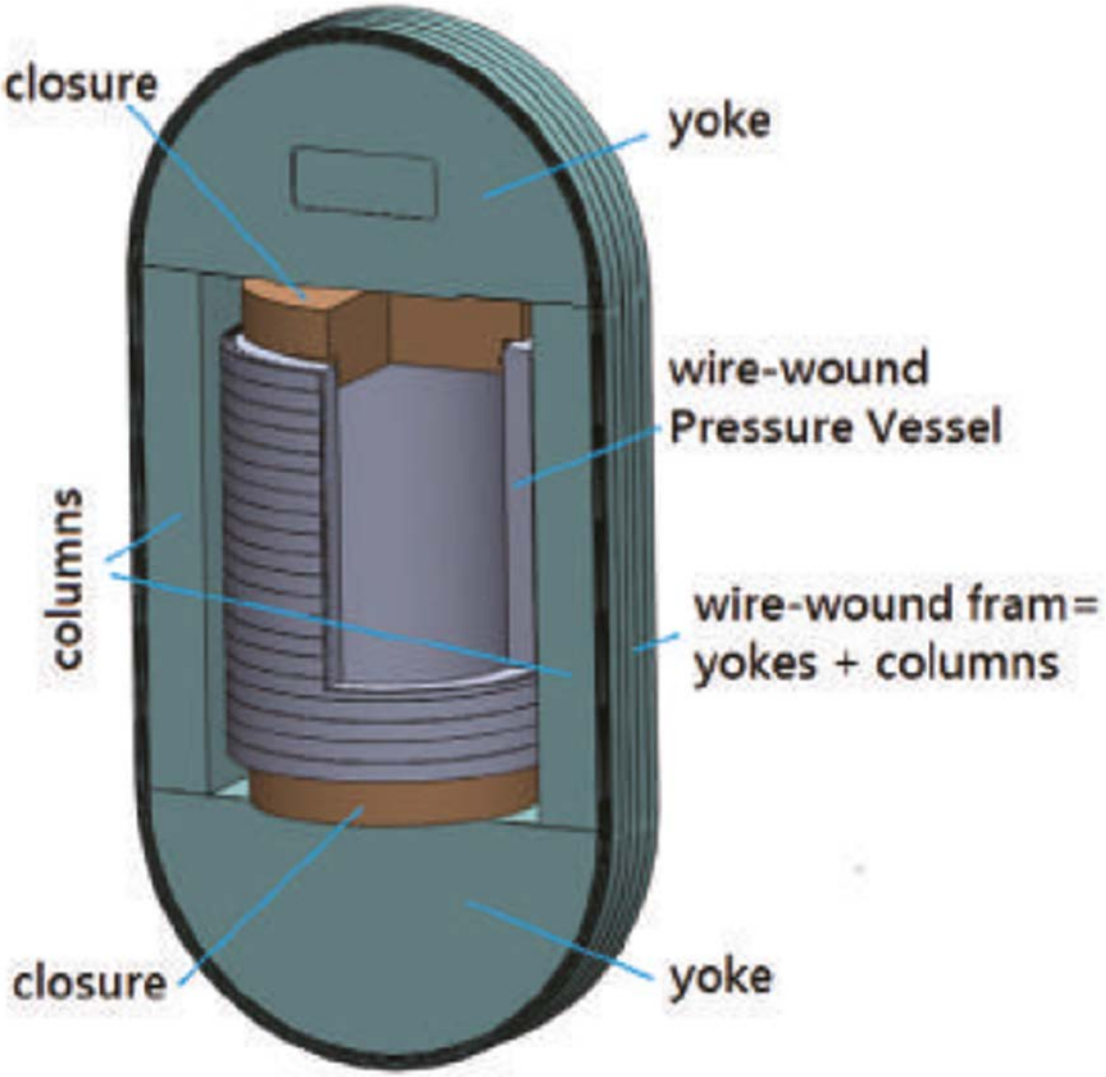
Reply 1: No. ASME replacement parts fabricated by welding that require shop inspection by an Authorized Inspector shall be fabricated by an organization having an appropriate ASME Certificate of Authorization.
Question 2: An ASME stamped item is determined to be corroded beyond repair and the only salvageable part is the ASME Code stamping or nameplate. Is it the intent of the NBIC to permit a holder of an "R" Certificate only to build a complete new and exact pressure retaining replacement item using the original ASME construction Code, Section, Edition and Addenda and same materials, transfer and document the transfer of the ASME stamping or nameplate on an R-1 Form to the new pressure-retaining item and stamp the repair with the "R" stamp?
Reply 2: No.
Question 3: Does the NBIC define the point at which a repair becomes new construction?
Reply 3: No.

PROPOSED INTERPRETATION

Item No. **20-14**	Mechanical Installation of Replacement Parts in ASME Section VIII Division 3 Pressure Vessels
Source	Monte Bost, monte_bost@hsb.com, 937-620-3676
Subject	Part 3, Section 3.2.2, 3.3.3, and 5.12.4.1, Installation of Replacement of Parts Without Welding
Edition	2019
Question	Q1: A Section VIII, Division 3 pressure vessel is made without welding from machined forgings. The pressure retaining components consist of a cylinder, end closures and a frame that holds the end closures in place. If one of the pressure retaining components is replaced with a new ASME-stamped "Part", is this activity considered a repair? Q2: For the repair described in Question (1) above, how shall Line 7, "REPAIR TYPE" be indicated on the Form R-1, *Report of Repair*?
Proposed Reply	R1: Yes R2: Indicate "Type of Repair: Mechanical" in Line 10 "Remarks".
Committee's Question	Q1: An ASME Section VIII, Division 3 pressure vessel is made without welding from machined forgings. The pressure retaining components consist of a cylinder, end closures and a frame that holds the end closures in place. Is replacement of one of the pressure retaining components with a new ASME-stamped "Part" considered a repair? Q2: For the repair activity described in Question 1, does indication of "Mechanical Repair" in Line 10 Remarks of Form R-1 meet the requirements for identification of Repair Type in Line 7 of Form R-1?
Committee's Reply	R1: Yes, see Part 3, 3.3.3.h R2: Yes.
Rationale	The definition of "Mechanical Assembly" in Part 3, Section 9, includes language related to restoration of the pressure retaining boundary. The examples of repairs described in Part 3, 3.3.3.h involving use of replacement parts are not limited to installation by welding. Per Part 3, Section 1.5.1.h, the Quality System shall include controls for repairs and alterations, including mechanical assembly, as applicable. Per Part 3, Section 5.12.4.1, use of the Remarks Section on Form R-1 is available to include supplemental information not otherwise covered on the form.
SC Vote	
NBIC Vote	
Negative Vote Comments	

Background / Explanation of Need

A Section VIII, Division 3 pressure vessel is made from machined forgings with no welding. The pressure retaining items are a cylinder, end closures and a frame that holds the end closures in place. A sketch is provided.



The original ASME Data Report does not reflect the correct “Part” serial number when it is replaced with no documentation. ASME Section VIII, Division 3 Code stamped "Parts" are being replaced with new ASME Code stamped "Parts" without any documentation. The original ASME Data Report listed the original "Part" serial number and will no longer be accurate if the original "Part" is replaced.

PROPOSED INTERPRETATION

Inquiry No.	**20-17**
Source	Roy Darby, Chevron Products Company roy.darby@chevron.com
Subject	Weld build of wasted areas with different material **Background:** It is common practice to weld build the wasted area of a component with original material and then to overlap with a corrosion resistant material to prevent future wasting of the component. It would be more efficient to simply restore the wasted area with the corrosion resistant material, provided that it meets or exceeds the strength requirements of the original material. This represents cost savings for industry with no expected downside.
Edition	2019; Part: Repairs and Alterations; Section: 3; Paragraph: 3.3.3 Examples of Repairs and 3.3.4.3 Wasted Areas
Question	Question: Would it be acceptable as a repair to weld build wasted areas with a material of different nominal composition and, equal to or greater in ultimate 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 would be at least equal to the thickness stated on the original Manufacturer's Data Report. This would be an amalgamation of 3.3.3 (c),(d), and (r) into a single activity.
Reply	Proposed Reply: Yes.
Committee's Question	May the use of a corrosion resistant filler metal of different chemical composition but of equal strength as that of the base metal for a pressure retaining item be ~~used for weld repair of wasted areas~~ considered a repair?
Committee's Reply	No
Rationale	Under examples of repair in 3.3, these are provided as specific examples of repair and as such the 2019 Edition of the NBIC does not specifically address this type of weld repair, as an example. ~~This is consulting.~~

PROPOSED INTERPRETATION

Inquiry No.	**20-21**
Source	Eric Feeney, TEI Construction Services efeeney@teiservices.com
Subject	Nondestructive Examination **Background:** When a boiler outage is being performed, there may be 50-10,000+ welds made. We are accustomed to performing 100% volumetric examination when a hydrostatic test is not being performed. Some of our inspectors suggest that we can perform a portion of the NDE as volumetric and the remainder as VT. When I read 4.4.1 e) it seems to have validity, but I generally have understood paragraph e) to have been referring to each individual weld and not the repair as a whole. This is what I would like clarification on.
Edition	2019; Part: Repairs and Alterations; Section: 4; Paragraph: 4.4.1 e)
Question	Question: May a portion of a repair be subject to NDE other than visual, and the remainder of the repair be subject to exclusive use of VT in accordance with Part 3, 4.4.1 e)?
Reply	Proposed Reply: Yes.
Committee's Question	**Question:** ~~Routine weld repairs are being performed to pressure retaining parts of an ASME B&PV Code Section I boiler.~~ May exclusive use of VT be performed in accordance with Part 3, 4.4.1 e) when pressure testing or alternative NDE methods other than visual examination, are not practicable~~.~~?
Committee's Reply	**Proposed Reply:** ~~Yes~~No, except as permitted for Routine Repairs.~~.~~ UNDER THE LINE COMMENT (not published): Please refer to Interpretations 11-01 and 98-04
Rationale	NBIC Part 3, 4.2 a) specifically limits substitution of alternative NDE methods to situations where NDE to the original code of construction is not possible or practicable. The inquirer is referred to Interpretation 17-01 regarding clarification of the term 'practicable.' NBIC Part 3, 4.4.1 e) 1) specifically limits any substitution of NDE with VT to routine repairs. Routine repairs are defined in NBIC Part 3, 3.3.2 e). NBIC Part 3, nor the original Code of Construction, specify the number or type of preferred NDE that must be performed for a weld repair. This is a contractual agreement that is outside the scope of NBIC Part 3.

Relevant Background

4.2 NONDESTRUCTIVE EXAMINATION

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

4.4.1 TEST OR EXAMINATION METHODS APPLICABLE TO REPAIRS (19)

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

e) Nondestructive Examination (NDE)

NDE may be conducted. NDE methods used shall be suitable for providing meaningful results to verify the integrity of the repair. Exclusive use of visual examination (VT) is only permitted with the following considerations:

1) When a pressure test or alternative NDE methods other than visual examination, are not practicable the exclusive use of direct VT as an NDE method shall be limited to routine repairs, as identified in NBIC Part 3, 3.3.2.

2) For each repair being considered, the exclusive use of direct VT as an NDE method shall be acceptable to the Inspector, and where required, the Jurisdiction.

3) As a minimum, direct VT shall be performed after the root weld layer or first-pass is deposited, and the final weld surface. Other weld layers shall be examined as identified by the Inspector and, where required, the Jurisdiction.

4) Personnel completing direct VT shall be qualified and certified in accordance with paragraph NBIC Part 3, 4.2- b), AWS QC-1, or any nationally recognized standard acceptable to the Jurisdiction. Visual acuity shall be demonstrated using as a minimum, standard J-2 letters on standard Jaeger test type charts for near vision.

5) Direct VT shall be performed in accordance with a written procedure meeting the procedure and reporting requirements listed in the original code of construction or ASME Section V, Article 9.

Part 3, Section 9, Glossary of Terms
Repair — The work necessary to restore pressure-retaining items to a safe and satisfactory operating condition. (Would seem to imply that 'repair' can include one or more welds repairs)

INTERPRETATION 01-40

Subject: RC-2051(e), RC-3031(c), RC-2050, RC-3030(c)
2001 Edition with 2003 Addendum

Question: If pressure testing is not practicable and if concurrence of the owner, Inspector and jurisdiction is obtained where applicable, may the Visual Testing (VT) NDE method be used to satisfy the NBIC requirement?

Reply: Yes.

INTERPRETATION 17-01

Subject: Application of Term "Practicable

Edition: 2017

Question: May the desire to save time and/or expense be used solely in determining if a repair and/or alteration activity is practicable?

Reply: No. The determination of “practicable” shall be based on technical consideration of the nature and scope of repair and/or alteration activities.

PROPOSED INTERPRETATION

Inquiry No.	**20-23**
Source	Paul Shanks, OneCIS Paul.shanks@onecis.com
Subject	Alteration of ASME Section VIII Div.2 vessels **Background:** Many Div.2 vessels which are in need of repair are of sufficient age whereby all of the original paperwork was paper work. Even with the best efforts such documents can become damaged or lost by the flooding event associated with the gulf coast hurricane events and or the types of refinery fires that are all too common. In a good deal of cases these vessels simply need a new B-16.5 weld neck flange or a gasket surface weld metal build up in order to allow continued leak free surface but due to some documents being unavailable the owner is left to choose between making no repair or making a repair which is not compatible with the NBIC. **Explanation of Need:** 3.3.5.2 & 3.4.5.1 both require that a repair or alteration for div.2 vessels are checked for compatibility with the original UDS which is clearly best practice for these higher stressed vessels, however a great deal of work needed on these vessels no doubt due to the higher level of engineering examination during initial fabrication is limited to fixing the problems that come form leaking gaskets i.e. corrosion on gasket faces which may require weld metal build up less than 20"2 or replacement of an ASME standard flange like for like. The professional engineer whom must review and sign for repair plans is qualified to review the service history and/or whatever original documentation is available and determine if a simple flange replacement or weld metal build up is acceptable or not.
Edition	2019 NBIC, Part 3, 3.4.5.1 b)
Question	Question: Given that Paragraph 3.4.5.1 b) allows for the User Design Specification (UDS) to be revised in the case where a proposed alteration is not compatible with the existing UDS is it unacceptable in cases where the original UDS is not available to generate a new UDS which is compatible with the design load case included with the original Manufactures Design Report?
Reply	Proposed Reply: No.
Committee's Question	In Part 3, 3.4.5.1 b) for an ASME Section VIII, Div 2 or Div 3 vessel, may an R-Certificate holder generate a replacement User Design Specification (UDS) in the event the original UDS was lost/destroyed?
Committee's Reply	No.
Rationale	The UDS is a unique document that contains the User's specific information regarding design conditions of the Div 2 or Div 3 vessel. Revising an existing UDS is not the same as generating a completely new UDS if the original was lost.

PROPOSED INTERPRETATION

Inquiry No.	**20-24**
Source	Paul Shanks, OneCIS Paul.shanks@onecis.com
Subject	**Certification of repair or alteration plans** **Background:** NBIC Part 3 3.3.5.2 a) requires the repair plan to be reviewed and certified to ensure the work involved is compatible with the User's Design Specification (UDS) and the Manufacturer's Design Report (MDR). 3.4.5.1 b) allows the UDS to be revised if a proposed alteration plan is not compatible with the original UDS. This revised UDS must be certified by an engineer as well as the alteration plan. Currently, NBIC Part 3 does clarify the separation of the two certifying activities which is not in the spirit of ASME Section VIII, Division.2 requiring different Certifying Engineers for the UDS and MDR.
Edition	2019 NBIC, Part 3 3.3.5.2 a) and Part 3, 3.4.5.1 b)
Question	Question: Is it acceptable for the repair plan or alteration plan to be certified by one of the same engineers that certified the UDS, Revised UDS or MDR?
Reply	Proposed Reply: No.
Committee's Question 1	**May the Certifying Engineer who certified the MDR or UDS of an ASME Section VIII Division 2 or 3 pressure retaining item (PRI) certify the repair plan?**
Committee's Reply 1	**Yes**
Committee's Question 2	**May the Certifying Engineer who certified the MDR or UDS of an ASME Section VIII Division 2 or 3 PRI certify the alteration plan or the revised UDS?**
Committee's Reply 2	**Yes**
Committee's Question 3	**May the Certifying Engineer who certified the revised UDS certify the alteration plan on an ASME Section VIII Division 2 or 3 PRI.**

Committee's Reply 3	**No**
Rationale	**ASME Section VIII, Division 2** **ANNEX 2-A** **GUIDE FOR CERTIFYING A USER'S DESIGN SPECIFICATION** **2-A.2 CERTIFICATION OF THE USER'S DESIGN SPECIFICATION** **2-A.2.1** When required by 2.2.1.1 or 2.2.1.2, certification of the User's Design Specification requires the signature(s) of one or more Certifying Engineers with requisite experience and qualifications as defined in Annex 2-J. The Certifying Engineer(s) shall certify that the User's Design Specification meets the requirements of 2.2.2. *(a)* The Certifying Engineer(s) shall prepare a statement to be affixed to the document attesting to compliance with the applicable requirements of the Code (see 2-A.2.3). *(b)* This Certifying Engineer shall be other than the Certifying Engineer who certifies the Manufacturer's Design Report, although both may be employed by or affiliated with the same organization. *(c)* The Certifying Engineer shall identify the location and authority under which he or she has received the authority to perform engineering work stipulated by the user in the User's Design Specification. **2-A.2.2** When more than one Certifying Engineer certifies and signs the User's Design Specification the area of expertise shall be noted next to their signature under "areas of responsibilities" (e.g., design, metallurgy, pressure relief, fabrication). In addition, one of the Certifying Engineers signing the User's Design Specification shall certify that all elements required by this Division are included in the Specification. **2-A.2.3** An example of a typical User's Design Specification Certification Form is shown in Table 2-A.1. **ANNEX 2-B** **GUIDE FOR CERTIFYING A MANUFACTURER'S DESIGN REPORT** **2-B.2 CERTIFICATION OF MANUFACTURER'S DESIGN REPORT BY A CERTIFYING ENGINEER** **2-B.2.1** When required by either 2.3.3.1(a) or 2.3.3.2, certification of the Manufacturer's Design Report requires the signature(s) of one or more Certifying Engineers with requisite experience and qualifications as defined in Annex 2-J. The Certifying Engineer(s) shall certify that the Manufacturer's Design Report meets the requirements of 2.3.3. *(a)* The Certifying Engineer(s) shall prepare a statement to be

	affixed to the document attesting to compliance with the applicable requirements of the Code (see 2-B.4). *(b)* This Certifying Engineer shall be other than the Certifying Engineer who certifies the User's Design Specification, although both may be employed by or affiliated with the same organization. *(c)* The Certifying Engineer shall identify the location and authority under which he or she has reached the authority to perform engineering work stipulated by the user in the User's Design Specification. **2-B.2.2** When more than one Certifying Engineer certifies and signs the Manufacturer's Design Report, the area of expertise shall be noted next to their signature under "areas of responsibilities" (e.g., design, metallurgy, pressure relief, fabrication). In addition, one of the Certifying Engineers signing the Manufacturer's Design Report shall certify that all elements required by this Division are included in the Report. Here is an older interpretation from ASME Section VIII, Division 2 as well: **Standard Designation:** BPV Section VIII Division 2 **Edition/Addenda:** 2013 **Para./Fig./Table No:** Annex 2-A **Subject Description:** Section VIII, Division 2; Annex 2-A - User Design Specification (UDS) **Date Issued:** 01/07/2016 **Record Number:** 15-2001 **Interpretation Number:** BPV VIII-2-16-1 **Question(s) and Reply(ies):** Question: In accordance with paragraph 2-A.2.1(a), is it prohibited for a Manufacturer to obtain the services of a Registered Professional Engineer to certify the User's Design Specification provided that the same engineer does not certify both the User Design Specification and the Manufacturer's Design Report? Reply: No.

PROPOSED INTERPRETATION

Inquiry No.	20-29
Source	Craig Bierl, Chubb Limited craig.bierl@chubb.com
Subject	PV Cycles of operations change as an alteration **Background:** Isostatic Presses in particular (but found in other pressure vessels also) are restricted by the data report to a finite number of cycles. Operators of these vessels routinely use curves to modify what is considered a cycle and extend the life of the vessel. These vessels represent a substantial risk of failure and this practice is very difficult for the inservice inspector to successfully track and audit to ensure the integrity of these vessels are maintained as this is a grey area in the current code as written. This is the real life scenario that has appeared on 7 of these vessels in the last 6 months (that is every one that I have been involved in evaluating for insurance coverage). 1. ASME data report says X cycles. Normally around 15-25,000. 2. Vessel is 20+ years old 3. You ask about operation and the vessel operates 330 days per year and has 5 operating cycles per day (some are 2 some are more, just throwing a number up to illustrate). So, simple math says 330x5=1650 cycles per year 25,000/1650=15.15 years of life 4. You ask for records of the operation a. You are presented with a degraded cycle curve b. "we don't operate at maximum temp (and/or) pressure" so we aren't taking a full cycle c. So now the same vessel shows that it only has 650 cycles on it or 1200 (instead of 30,000) 5. Their argument is that they are below the "design cycles", well there is no rational that the inspector can adequately track the design cycles to a degree of comfort. a. I attached one of the better design cycle tracking mechanism's I have seen, however it is still lacking Bottom line, the "operational cycle" is easily trackable. The use of curves to increase the operational cycle count beyond the ASME data report cycle maximum appears to be in conflict and lacks standardization, which makes it difficult to audit and ensure uniform measures are being taken. The cycle count appears on the data report as a criteria, if that criteria is intended to limit the operational cycle, than the use of a curve to extend that cycle should be considered an alteration and rerating of the vessel. If the cycle count on the data report is not intended to be limited by the operating cycle, then some form of standard should be created for the different types of variances that are used to extend this cycle count (by temperature, pressure, etc).
Edition	2019 NBIC, Part 3, 3.4.4 2019 NBIC, Part 2, 2.3.6.8 & 2.3.6.10
General Description	Section VIII Div.2 or Div.3 cycle life design definition

Question	Question: Should the use of a curve to extend the number of operating cycles beyond the number of cycles indicated on the ASME data report be considered an alteration/re rating of a pressure vessel (ASME Section 8 Part 3)?
Reply	Proposed Reply: Yes. The use of a curve to extend the number of operating cycles is a change in the material data on the ASME data report and is therefore an alteration of the vessel and should be considered as such through a formal re-rating process.
Committee's Question	When the design ~~definition~~ of a PRI includes cyclic loading data, should an adjustment, modification or change in analysis of ~~said~~the original design data be considered an alteration?
Committee's Reply	Yes
Rationale	For PRI's in cyclic service (thermal or mechanical) the load histograms are just as essential to the design definition as MAWP or MDMT, when those values are changed we consider that to be an alteration. In Section ~~8~~ VIII Div.2 for a class 1 vessel per paragraph 2.2.2.1 supplying the information to do fatigue analysis triggers the UDS into needed an RPE sign off. Per 2.3.3.1 conducting fatigue analysis is one of 4 events that triggers an RPE signature on the manufactures design report. Per NBIC: **Alteration** — A change in the item described on the original Manufacturer's Data Report which affects the pressure containing capability of the pressure-retaining item. (See NBIC Part 3, 3.4.3, *Examples of Alteration*) Nonphysical changes such as an increase in the maximum allowable working pressure (internal or external), increase in design temperature, or a reduction in minimum temperature of a pressure-retaining item shall be considered an alteration.
SC Vote	
NBIC Vote	
Negative Vote Comments	

PROPOSED INTERPRETATION

Inquiry No.	**20-49**
Source	Susumu Terada Terada.susumu@kobelco.com Kobe Steel, Ltd.
Subject	Subject: Alternative Method in lieu of Pressure Testing or Examination in Part 3, 4.4.2 c
Edition	2019
Question	Question: When contamination of pressure-retaining items by liquids is possible, pressure testing is not practicable and NDE is not effective, may finite-element analysis in accordance with Part 5 of the same edition of the original construction code, ASME Code Section VIII, Div. 2, be used to ensure the structural integrity of the alteration?
Reply	Proposed Reply: Yes. Concurrence of the owner shall be obtained in addition to the Inspector and Jurisdiction where required.
Committee's Question	When performing an alteration on a pressure ~~testing~~ retaining item and use of examination or test methods listed in Part 3, 4.4.2 are not possible, ~~can~~ may finite element~~al~~ analysis (FEA) be used in accordance with the original code of construction?
Committee's Reply	No, this ~~This is outside the scope of the~~method is not addressed in Part 3 of the ~~-~~NBIC.
Rationale	This inquiry was submitted regarding not being able to pressure test with liquid or perform NDE. However, the Inquirer failed to consider or eliminate pneumatic testing as a possibility in Part 3, 4.4.2~~b~~.

Item #: NB15-1405
Revision: 1
Date: January 14, 2020
Subject: Clarification of Impact Testing Rules for Repairs

Justification:
This revision was generated to address an interpretation asking whether production impact test plates were required for repair of vessels made from P-No 11B materials, when no extra material from one of the heats exist. Where extra material does not exist from one of the heats, the original code of construction would require existing material from the vessel to be used. This would require the vessel to be further damaged with material being cut out to serve as a test plate.

Initially this interpretation was meant to address only P-No 11B material; however, this same problem exists for all vessel materials. As a result, the following proposal was generated.

INSERT NEW PARAGRAPHS:

3.3.6 Pressure Vessel Impact Testing

3.3.6.1 Welding procedures used for repairs shall be qualified with impact testing when required by the original code of construction. The requirements for impact testing shall be in accordance with the rules of the original code of construction except that vessel (production) impact testing is not required.

3.3.6.2 The test material for the welding procedure qualification with impact testing shall be of the same P-number and Group number, and heat-treated condition as the material being repaired.

a) In the event that the notch toughness of the material to be repaired is unknown, evidence from tests of that material or from another acceptable source (see NBIC Part 3, 2.5.3) may be used for the base metal notch toughness when qualifying the WPS as required in NBIC Part 3, 2.5.3.2 h).

b) In the event that the original material specification is obsolete, the ~~test~~ material used for the test coupon should conform as closely as possible to the original material used for construction based on nominal composition and carbon equivalent (IIW Formula CE

= C + Mn/6 + (Cr + Mo + V)/5 + (Ni + Cu)/15; elements are expressed in Weight Percent Amounts), and heat-treated condition, but in no case shall the material be lower in strength.

2.3 STANDARD WELDING PROCEDURE SPECIFICATIONS (SWPSs)

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

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

1) Reaffirmed SWPSs: When reaffirmation occurs without revision to the SWPS, the letter R is added to the SWPS designation.

2) Amended SWPSs: When an amendment occurs the suffix “AMD1” is added to the SWPS designation. Amendments are issued when essential for the prompt correction of an error that could be misleading. Amendments are incorporated into the existing text of the SWPS, which is reprinted and clearly marked as incorporating an amendment(s), and which is identified in the revised Foreword of the amended SWPS.

3) Revised SWPSs: When a revision to a published SWPS occurs, the publication date is added to the SWPS designation. The date of the superseded SWPS is also noted on the cover page. Previous versions of the superseded SWPS may be used at the option of the R Certificate holder.

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

TABLE 2.3

CARBON STEEL- (P1/M1 MATERIAL)

SMAW — Shielded Metal Arc Welding	
TITLE	**DESIGNATION: YEAR**
Standard Welding Procedure Specification for Shielded Metal Arc Welding of Carbon Steel, (M-1/P-1, Group 1 or 2), 3/16 in. (5 mm) through 3/4 in. (19 mm) Thick, As-Welded Condition, With Backing, Primarily Plate and Structural Applications.	B2.1-1-001: ~~2018~~2020
Standard Welding Procedure Specification for Shielded Metal Arc Welding of Carbon Steel (M-1/P-1~~/S-1~~, Group 1 or 2), 1/8 in. (3 mm) through 1 ½ in. (38 mm) Thick, E7018, As-Welded or PWHT Condition, Primarily Plate and Structural Applications.	B2.1-1-016: 2018
Standard Welding Procedure Specification for Shielded Metal Arc Welding of Carbon Steel (M-1/P-1~~/S-1~~, Group 1 or 2), 1/8 in. (3 mm) through 1 ½ in. (38 mm) Thick, E6010, As-Welded or PWHT Condition, Primarily Plate and Structural Applications.	B2.1-1-017: 2018
Standard Welding Procedure Specification for Shielded Metal Arc Welding of Carbon Steel (M-1/P-1~~/S-1~~, Group 1 or 2), 1/8 in. (3 mm) through 1 ½ in. (38 mm) Thick, E6010 (Vertical Uphill) followed by E7018, As-Welded or PWHT Condition, Primarily Plate and Structural Applications.	B2.1-1-022: 2018
Standard Welding Procedure Specification for Shielded Metal Arc Welding of Carbon Steel (M-1/P-1~~/S-1~~, Group 1 or 2), 1/8 in. (3 mm) through 1 ½ in. (38 mm) Thick, E6010 (Vertical Downhill) followed by E7018, As-Welded or PWHT Condition, Primarily Plate and Structural Applications.	B2.1-1-026: 2018
Standard Welding Procedure Specification for Shielded Metal Arc Welding of Carbon Steel (M-1/P-1, Group 1 or 2), 1/8 in. (3mm) through 3/4 in. (19 mm) Thick, E6010 (Vertical Uphill) followed by E7018, (Vertical Uphill) in the As-Welded Condition, Primarily Pipe Applications.	B2.1-1-201: 2019
Standard Welding Procedure Specification for Shielded Metal Arc Welding of Carbon Steel (M-1/P-1, Group 1 or 2), 1/8 in. (3 mm) through 3/4 in. (19 mm) Thick, E6010 (Vertical Downhill) followed by E7018 (Vertical Uphill), in the As-Welded Condition, Primarily Pipe Applications.	B2.1-1-202: 2019
Standard Welding Procedure Specification for Shielded Metal Arc Welding of Carbon Steel (M-1/P-1, Group 1 or 2), 1/8 in. (3 mm) through 3/4 in. (19 mm) Thick, E6010 (Vertical Uphill), In the As-Welded Condition, Primarily Pipe Applications.	B2.1-1-203: 2019
Standard Welding Procedure Specification for Shielded Metal Arc Welding of Carbon Steel (M-1/P-1, Group 1 or 2), 1/8 in. (3 mm) through 3/4 in. (19 mm)Thick, E6010 (Vertical Downhill Root with balance Vertical Uphill), in the As-Welded Condition, Primarily Pipe Applications.	B2.1-1-204: 2019
Standard Welding Procedure Specification for Shielded Metal Arc Welding of Carbon Steel (M-1/P-1, Group 1 or 2), 1/8 in. (3 mm) through 1 ½ in. (38 mm) Thick, E6010 (Vertical Uphill) followed by E7018 (Vertical Uphill), in the As-Welded or PWHT Condition, Primarily Pipe Applications.	B2.1-1-205:2019
Standard Welding Procedure Specification for Shielded Metal Arc Welding of Carbon Steel (M-1/P-1, Group 1 or 2), 1/8 in. (3 mm) through 1-1/2 in. (38 mm) Thick, E6010 Vertical Downhill) followed by E7018 (Vertical Uphill), in the As-Welded or PWHT Condition, Primarily Pipe Applications.	B2.1-1-206:2019
Standard Welding Procedure Specification for Shielded Metal Arc Welding of Carbon Steel (M-1/P-1, Group 1 or 2), 1/8 in. (3 mm) through 1 ½ in. (38 mm) Thick, E7018, in the As-Welded or PWHT Condition, Primarily Pipe Applications.	B2.1-1-208: 2019

GTAW — Gas Tungsten Arc Welding	
TITLE	**DESIGNATION: YEAR**
Standard Welding Procedure Specification for Gas Tungsten Arc Welding of Carbon Steel, (M-1/P-1, Group 1 or 2), 3/16 in. (5 mm) through 7/8 in. (22 mm) Thick, ER70S-2 and ER70S-3, in the As-Welded Condition~~, With or Without Backing,~~ Primarily Plate and Structural Applications.	B2.1-1-002: ~~2006~~2020
Standard Welding Procedure Specification for Gas Tungsten Arc Welding of Carbon Steel (M-1/P-1, Group 1 or 2), 1/8 in. (3 mm) through 1 ½in. (38 mm) Thick, ER70S-2, As-Welded or PWHT Condition, Primarily Pipe Application.	B2.1-1-207: 2019
Standard Welding Procedure Specification for Gas Tungsten Arc Welding with Consumable Insert Root of Carbon Steel (M-1/P-1/S-1, Group 1 or 2), 1/8 in. through 1-1/2 in. Thick, INMs-1, ER70S-2, As-Welded or PWHT Condition, Primarily Pipe Applications.	B2.1-1-210: 2012

FCAW — Flux Core Arc Welding	
TITLE	**DESIGNATION: YEAR**
Standard Welding Procedure Specification for Self-Shielded Flux Cored Arc Welding of Carbon Steel (M-1/P-1/S-1, Group 1 or 2), 1/8 in. through 1 ½ in. Thick, E71T-8, As-Welded Condition, Primarily Plate and Structural Applications.	B2.1-1-018: 2005
Standard Welding Procedure Specification for CO2 Shielded Flux Cored Arc Welding of Carbon Steel (M-1/P-1~~/S-1~~, Group 1 or 2), 1/8 in. (3 mm) through 1 ½ in. (38 mm) Thick, E70T-1 and E71T-1, As-Welded Condition, Primarily Plate and Structural Applications.	B2.1-1-019: 2018
Standard Welding Procedure Specification for 75% Ar/25% CO2 Shielded Flux Cored Arc Welding of Carbon Steel (M-1/P-1~~/S-1~~, Group 1 or 2), 1/8 in. (3 mm) through 1-1/2 in. (38 mm) Thick, E70T-1M and E71T-1M, As-Welded or PWHT Condition, Primarily Plate and Structural Applications.	B2.1-1-020: 2018
Standard Welding Procedure for Self-Shielded Flux Cored Arc Welding of Carbon Steel (M-1/P-1 Group 1 or 2), 1/8 in. (3 mm) through 1/2 in. (13 mm) Thick, E71T-11, As-Welded Condition, Primarily Plate and Structural Applications.	B2.1-1-027: 2018
Standard Welding Procedure Specification (SWPS) for Argon Plus 25% Carbon Dioxide Shielded Flux Cored Arc Welding of Carbon Steel (M-1/P-1/S-1, Groups 1 and 2), 1/8 in. through 1 ½ in. Thick, E7XT-XM, As-Welded or PWHT Condition, Primarily Pipe Applications.	B2.1-1-234: 2006

GMAW – Gas Metal Arc Welding	
TITLE	**DESIGNATION: YEAR**
Standard Welding Procedure Specification for 75% Argon Plus 25% Carbon Dioxide Shielded Gas Metal Arc Welding (Short Circuiting Transfer Mode) followed by Argon Plus 2% Oxygen Shielded Gas Metal Arc Welding (Spray Transfer Mode) of Carbon Steel (M-1/P-1~~/S-1~~, Groups 1 and 2), 1/8 in. (3 mm) through 1 ½ in. (38 mm) Thick, ER70S-3, in the As-Welded or PWHT Condition, Primarily Pipe Applications.	B2.1-1-233: ~~2006~~2020
Standard Welding Procedure Specification for Argon Plus 2% Oxygen Shielded Gas Metal Arc Welding (Spray Transfer Mode) of Carbon Steel (M-1/P-1/S-1, Groups 1 and 2), 1/8 in. through 1 ½ in. Thick, ER70S-3, Flat Position Only, As-Welded or PWHT Condition, Primarily Pipe Applications.	B2.1-1-235: 2006

GTAW/SMAW Combination of Welding Processes	
TITLE	**DESIGNATION: YEAR**
Standard Welding Procedure Specification for Gas Tungsten Arc Welding Followed by Shielded Metal Arc Welding of Carbon Steel (M-1/P-1~~/S-1~~, Group 1 or 2), 1/8 in. (3 mm) through 1 ½ in. (38 mm) Thick, ER70S-2 and E7018, As-Welded or PWHT Condition, Primarily Plate and Structural Applications.	B2.1-1-021: 2018
Standard Welding Procedure Specification for Gas Tungsten Arc Welding followed by Shielded Metal Arc Welding of Carbon Steel (M-1/P-1, Groups 1 or 2), 1/8 in. (3 mm) through 1 ½ in. (38 mm) Thick, ER70S-2 and E7018, As-Welded or PWHT Condition, Primarily Pipe Applications.	B2.1-1-209: 2019
Standard Welding Procedure Specification for Gas Tungsten Arc Welding with Consumable Insert Root Followed by Shielded Metal Arc Welding of Carbon Steel (M-1/P-1/S-1, Group 1 or 2), 1/8 in. through 1 ½ in. Thick, INMs-1, ER70S-2, and E7018 As-Welded or PWHT Condition, Primarily Pipe Applications.	B2.1-1-211: 2012

GMAW/FCAW – Combination of Welding Processes	
TITLE	**DESIGNATION: YEAR**
Standard Welding Procedure Specification for 75% Argon Plus 25% Carbon Dioxide Shielded Gas Metal Arc Welding (Short Circuiting Transfer Mode) Followed by 75% Argon Plus 25% Carbon Dioxide Shielded Flux Cored Arc Welding of Carbon Steel (~~m~~M-1/P-1~~/S-1~~, Groups 1 ~~and~~ or 2), 1/8 in. (3 mm) through 1 ½ in. (38 mm) Thick, ER70S-3 and E71~~X~~T-X, in the As-Welded or PWHT Condition, Primarily Pipe	B2.1-1-232: ~~2006~~2020

Austenitic Stainless Steel — (M8/P8 Materials)

SMAW — Shielded Metal Arc Welding	
TITLE	**DESIGNATION: YEAR**
Standard Welding Procedure Specification for Shielded Metal Arc Welding of Austenitic Stainless Steel (M-8/P-8~~/S-8~~, Group 1), 1/8 in. (3 mm) through 1½ in. (38 mm) Thick, As-Welded Condition, Primarily Plate and Structural Applications.	B2.1-8-023: 2018
Standard Welding Procedure Specification for Shielded Metal Arc Welding of Austenitic Stainless Steel (M-8/P-8/S-8, Group 1), 1/8 in through 1½ in. Thick, E3XX-XX, As-Welded Condition, Primarily Pipe Application.	B2.1-8-213: 2012

GTAW — Gas Tungsten Arc Welding	
TITLE	**DESIGNATION: YEAR**
Standard Welding Procedure Specification for Gas Tungsten Arc Welding of Austenitic Stainless Steel (M-8/P-8/S-8, Group 1), 1/16 in. through 1 ½ in. Thick, ER3XX, As-Welded Condition, Primarily Plate and Structural Applications.	B2.1-8-024: 2012
Standard Welding Procedure Specification for Gas Tungsten Arc Welding of Austenitic Stainless Steel (M-8/P-8/S-8, Group 1), 1/16 in. through 1 ½ in. thick, ER3XX, As-Welded Condition, Primarily Pipe Applications.	B2.1-8-212: 2012

Standard Welding Procedure Specification for Gas Tungsten Arc Welding With Consumable Insert Root of Austenitic Stainless Steel (M-8/P-8/S-8, Group 1), 1/8 in. through 1 ½ in. Thick, IN3XX and ER3XX As-Welded Condition, Primarily Pipe Applications.	B2.1-8-215: 2012

Combination Processes GTAW/SMAW	
TITLE	**DESIGNATION: YEAR**
Standard Welding Procedure Specification for Gas Tungsten Arc Welding followed by Shielded Metal Arc Welding of Austenitic Stainless Steel (M-8/P-8/S-8, Group 1), 1/8 in. through 1 ½ in. Thick, ER3XX and E3XX-XX, As-Welded Condition, Primarily Plate and Structural Applications.	B2.1-8-025: 2012
Standard Welding Procedure Specification for Gas Tungsten Arc Welding Followed by Shielded Metal Arc Welding of Austenitic Stainless Steel (M-8/P-8/S-8, Group 1), 1/8 in. through 1 ½ in. Thick, ER3XX and E3XX-XX, As-Welded Condition, Primarily Pipe Applications.	B2.1-8-214: 2012
Standard Welding Procedure Specification for Gas Tungsten Arc Welding with Consumable Insert Root followed by Shielded Metal Arc Welding of Austenitic Stainless Steel (M-8/P-8/S-8, Group 1), 1/8 in. through 1 ½ in. Thick, IN3XX, ER3XX, and E3XX-XX As-Welded Condition, Primarily Pipe Applications.	B2.1-8-216: 2012

Combination of Carbon Steel (M-1/P-1 Material) To Austenitic Stainless Steel (M-8/P-8 Material)

SMAW — Shielded Metal Arc Welding	
TITLE	**DESIGNATION: YEAR**
Standard Welding Procedure Specifications for Shielded Metal Arc Welding of Carbon Steel (M-1/P-1/S-1, Groups 1 or 2) to Austenitic Stainless Steel (M-8/P-8/S-8, Group 1), 1/8 in. through 1 ½ in. Thick, E309 (L)-15, -16, or -17, As-Welded Condition, Primarily Pipe Applications.	B2.1-1/8-228: 2013

GTAW — Gas Tungsten Arc Welding	
TITLE	**DESIGNATION: YEAR**
Standard Welding Procedure Specification for Gas Tungsten Arc Welding of Carbon Steel (M-1/P-1/S-1, Groups 1 or 2) to Austenitic Stainless Steel (M-8/P-8/S-8, Group 1), 1/16 in. (1.6 mm) through 1 ½ in. Thick, ER309(L), As-Welded Condition, Primarily Pipe Applications.	B2.1-1/8-227: 2013
Standard Welding Procedure Specifications for Gas Tungsten Arc Welding with Consumable Insert Root of Carbon Steel (M-1/P-1/S-1, Groups 1 or 2) to Austenitic Stainless Steel (M-8/P-8/S-8, Group 1), 1/16 in. (1.6 mm) through 1½ in. Thick, IN309 and ER309(L), As-Welded Condition, Primarily Pipe Applications.	B2.1-1/8-230: 2013

GTAW/SMAW Combination of Welding Processes	
TITLE	**DESIGNATION: YEAR**
Standard Welding Procedure Specifications for Gas Tungsten Arc Welding followed by Shielded Metal Arc Welding of Carbon Steel (M-1/P-1/S-1,Groups 1 or 2) to Austenitic Stainless Steel (M-8/P-8/S-8, Group 1), 1/8 in through 1½ in. Thick, ER309 (L) and E309 (L)-15, -16, or -17, As-Welded Condition, Primarily Pipe Applications.	B2.1-1/8-229: 2013
Standard Welding Procedure Specifications for Gas Tungsten Arc Welding with Consumable Insert Root followed by Shielded Metal Arc Welding of Carbon Steel (M-1/P-1/S-1, Groups 1 or 2) to Austenitic Stainless Steel (M-8/P-8/S-8, Group 1), 1/8 In. through 1½ in. Thick, IN3009, ER309, and E309-15, -16, or -17 or IN309, ER309 (L) and ER309 (L)-15, -16, or -17, As-Welded Condition, Primarily Pipe Applications.	B2.1-1/8-231: 2015

Chromium Molybdenum Steel (M4/P4 and M5A/P5A Materials)

SMAW — Shielded Metal Arc Welding	
TITLE	**DESIGNATION: YEAR**
Standard Welding Procedure Specifications for Shielded Metal Arc Welding of Chromium-Molybdenum Steel (M-4/P-4, Group 1 or 2), E8018-B2, 1/8 in. through 1 ½ in. Thick, As-Welded Condition, 1/8 in. through 1½ in. Thick, PWHT Condition, Primarily Pipe Applications.	B2.1-4-218: 2009
Standard Welding Procedure Specifications for Shielded Metal Arc Welding of Chromium-Molybdenum Steel (M-5A/P-5A), E9018-B3, 1/8 in. through 1 ½ in. Thick, As-Welded Condition, 1/8 in. through 1½ in. Thick, PWHT Condition, Primarily Pipe Applications.	B2.1-5A-223: 2009

GTAW — Gas Tungsten Arc Welding	
TITLE	**DESIGNATION: YEAR**
Standard Welding Procedure Specifications for Gas Tungsten Arc Welding of Chromium-Molybdenum Steel (M-4/P-4, Group 1 or 2), ER80S-B2, 1/8 in. through 1 ½ in. Thick, As-Welded Condition, 1/8 in. through ¾ in. Thick, PWHT Condition, Primarily Pipe Applications.	B2.1-4-217: 2009
Standard Welding Procedure Specifications for Gas Tungsten Arc Welding (Consumable Insert Root) of Chromium-Molybdenum Steel (M-4/P-4, Group 1 or 2), E8018-B2, 1/8 in. through 1 ½ in. Thick, As-Welded Condition, 1/8 in. through ¾ in. Thick, PWHT Condition, IN515 and ER80S-B2, Primarily Pipe Applications.	B2.1-4-220: 2009
Standard Welding Procedure Specifications for Gas Tungsten Arc Welding of Chromium-Molybdenum Steel (M-5A/P-5A), ER90S-B3, 1/8 in. through 1½ in. Thick, As-Welded Condition, 1/8 in. through 3/4 in. (19 mm) Thick, PWHT Condition, Primarily Pipe Applications.	B2.1-5A-222: 2009

Standard Welding Procedure Specifications for Gas Tungsten Arc Welding (Consumable Insert Root) of Chromium-Molybdenum Steel (M-5A/P-5A), 1/8 in. through 1-1/2 in. Thick, As-Welded Condition, 1/8 in. through 3/4 in. Thick, PWHT Condition, IN521 and ER90S-B3, Primarily Pipe Applications.	B2.1-5A-225: 2009

GTAW/SMAW Combination of Welding Processes	
TITLE	**DESIGNATION: YEAR**
Standard Welding Procedure Specifications for Gas Tungsten Arc Welding (Consumable Insert Root) followed by Shielded Metal Arc Welding of Chromium- Molybdenum Steel (M-4/P-4, Group 1 or 2), 1/8 in. through 1-1/2 in. Thick, As-Welded Condition, 1/8 in. through 1 ½ in. Thick, PWHT Condition, IN515, ER80S-B2, and E8018-B2, Primarily Pipe Applications.	B2.1-4-221: 2009
Standard Welding Procedure Specifications (SWPS) for Gas Tungsten Arc Welded followed by Shielded Metal Arc Welding of Chromium-Molybdenum Steel (M-4A/P-4, Group 1 or 2), 1/8 in. through 1/2 in. Thick, As-Welded Condition, 1/8 in. through 1 ½ in. Thick, PWHT Condition, ER80S-B2 and E8018-B2, Primarily Pipe Applications.	B2.1-4-219: 2009
Standard Welding Procedure Specifications for Gas Tungsten Arc Welded followed by Shielded Metal Arc Welding of Chromium-Molybdenum Steel (M-5A/P-5A), 1/8 in. through 1 ½ in. Thick, As-Welded Condition, 1/8 in. through 1 ½ in. Thick, PWHT Condition, ER90S-B3 and E9018-B3, Primarily Pipe Applications	B2.1-5A-224: 2009
Standard Welding Procedure Specifications for Gas Tungsten Arc Welding (Consumable Insert Root) followed by Shielded Metal Arc Welding of Chromium-Molybdenum Steel (M-5A/P-5A), 1/8 in. through 1 ½ in. Thick, As- Welded Condition, 1/8 in. through 1 ½ in. Thick, PWHT Condition, IN521, ER90S-B3, and E9018-B3, Primarily Pipe Applications.	B2.1-5A-226: 2009

Item 20-7

Routine repairs of Div.2 & or Div.3 vessels

Part 3, 3.3.2 a)

Submitted by: Paul Shanks

Explanation of Need: An interpretation is scheduled to be issued under item number 19-26 asserting that Routine repairs are not to be used on Div.2 or Div.3 vessels. Rather than require review of an interpretation which may expire in two years the body of the code should make it clear that Routine repairs are not compatible with div.2 or div.3 vessels.

Background Information: 3.3.5.2 b) makes clear that an Inspector will make the acceptance inspection and sign the R1, the provision in 3.3.2 to waive the AI involvement or routine repairs is simply not applicable.

Proposed Change:

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. ~~As such r~~Routine repairs are not ~~acceptable~~permitted for ASME Section VIII Div.2 or Div. 3 vessels. 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;

Item 20-9: Request for Revision to NBIC Section 9: Glossary of terms

Parts 1, 2, 3 and 4 9.1

Purpose	Define "Verify" and “Witness” in the NBIC Part 1, 2, 3, and 4 to align with the definition in NB-263, RCI-1, Rules for Commissioned Inspectors
Scope	Add “Verify” and “Witness” to the terms defined in Section 9 of Parts 1, 2, 3 and 4
Background	The need for the definition of "verify" and “witness” was initiated from Interpretation Item 18-03, which addresses which Inspector (i.e. “IS” Commissioned or “R” Endorsement) signs the FFSA Form NB-403 when an “R” Certificate Holder is involved with a repair in that region as well as determine what level of review of the Fitness-for-Service the Inspector is expected to complete.
Proposed Revision	Verify – To determine that a particular action has been performed in accordance with the requirements either by witnessing the action or reviewing records. Witness – To be present at an event and have first-hand knowledge of the action and be able to attest that it occurred.

Submitted by: Terry Hellman

Proposed Change:

9.1 DEFINTIONS

Verify – To determine that a particular action has been performed in accordance with the requirements either by witnessing the action or reviewing records.

Witness – To be present at an event and have first-hand knowledge of the action and be able to attest that it occurred.

Subject Code Revision to Part 3, 3.3.4.8

File Number NB20-10 **Prop. on Pg.**

Proposed Revision Statement of Need The revision is to clean up language in NBIC Part 3, 3.3.4.8 and to add clarification regarding the inspector required to sign form NB-403 (current request for interpretation linked to this need in Item 20-3).

Project Manager John Siefert/G. Galanes

SubGroup **SG Meeting Date**

Negatives

Background:
The current language in the NBIC Part 3, 3.3.4.8 makes multiple references to 'repair' and/or 'weld repair' which might confuse the reader. This language needs to be clarified so it is explicit in 3.3.4.8 b) "…One or more fitness-for-service engineering evaluation methods as described in NBIC Part 2, 4.4 shall be used to determine whether the defect may remain, either in part or in whole, in the pressure-retaining item…"

The current language in the NBIC Part 3, 3.3.4.8 needs to reference the correct forms and sections in Part 2 to avoid confusion.

A request for interpretation (current Item 20-3) was made referencing Part 3, 3.3.4.8 in regard to whether the National Board Inspector holding either an "IS" Commission or an "R" Endorsement is required to sign form NB-403. Language is added to 3.3.4.8 c) 5) to clarify this point.

3.3.4.8 REPAIR OF PRESSURE-RETAINING ITEMS WITHOUT COMPLETE REMOVAL OF DEFECTS

a) There may be cases where removal of a defect in a pressure-retaining item is not practical at the time the defect is found. In such cases, with approval of the Inspector and, when required, the Jurisdiction, an engineering evaluation shall be performed to determine the scope of the repair and impact to safety prior to returning the pressure-retaining item to service for a specified period of time. The engineering evaluation shall be performed by an organization with demonstrated competency in defect (and flaw) characterization of pressure-retaining items. The method of defect evaluation and time interval for returning the pressure-retaining item back to service shall be as agreed upon by the Inspector, and when required, the Jurisdiction. The specified period of time the defect can remain in service after weld repair shall be based on no measureable defect growth during subsequent inspections, or a period of time as specified by the Jurisdiction, if applicable. This repair method is not permitted for vessels used in lethal service, vessels designed for high-cycle operation or fatigue service, compressed air storage, and in cases where high stress concentration cannot be reduced by weld repair. This repair method is not permitted for DOT vessels.

b) One or more fitness-for-service engineering evaluation methods as described in NBIC Part 2, 4.4 shall be used to determine whether the defect may remain, either in part or in whole, in the pressure-retaining item. If it is determined that the defect can remain in the item, a risk-based inspection program shall be developed as described in NBIC Part 2, 4.5 to assure inspection of the defect and monitoring of defect growth over time. This program shall be a controlled and documented inspection program that specifies inspection intervals as agreed upon with the Inspector and, when required, the Jurisdiction, and shall be maintained until the defect can be completely removed and the item repaired.

c) The following requirements shall apply to the weld repair of pressure-retaining items without complete removal of defects:

1) Engineering evaluation of the defect in the pressure-retaining item shall be conducted using one or more fitness-for-service condition assessment method(s) as described in NBIC Part 2, 4.4. Engineering evaluation of the condition assessment results shall be performed by an organization that has demonstrated industry experience in evaluating pressure-retaining items ~~as referenced in NBIC, Part 2, S5.3~~. If the fitness-for-service engineering evaluation requires finite element analysis (FEA), the requirements in NBIC Part 2, 4.6 and NBIC Part 2, Supplement 11 shall be met.

2) If engineering evaluation indicates a defect can remain in the pressure-retaining item, a risk-based inspection program shall be developed and implemented based on review and acceptance by the Inspector and, when required, the Jurisdiction. The risk-based inspection program shall be in accordance with the requirements in NBIC, Part 2 4.4.

3) The fitness-for-service condition assessment and risk-based inspection programs shall remain in effect for the pressure-retaining item until such time that the defect can be completely removed and the item repaired. The fitness-for-service condition assessment method, results of assessment, and method of weld repair, if applicable, shall be documented on a Report of Fitness for Service Assessment (FFSA) Form as described in NBIC Part 2, 4.4.1 and shall be filed with the Jurisdiction, when required.

4) When weld repairs are performed without complete removal of the defect(s), this shall be noted on the Form R-1 in the description of the work. The "R" Stamp Holder performing the weld repairs shall pro-vide detailed information on the Form R-1, describing the method, and extent, of repair and include the specific location of the weld repair on the item.

5) The interval to either re-inspect or remove the item from service or perform weldfor repair shall be determined based on a risk-based inspection program developed and implemented as required by NBIC Part 3, 3.3.4.8 NBIC Part 2, 4.5. The inspection interval shall not exceed the remaining life of the item, and shall be documented on the FFSA Form Form NB-403 and in the Remarks section of the Form R-1. The FFSA FormForm NB-403 shall be affixed to the Form R-1 when weld repairs are performed in NBIC Part 3, 3.3.4.8. A National Board Commissioned Inspector holding an "R" endorsement as described in NB-263, RCI-1 shall sign both the Form R-1 and the attached Form NB-403[SJ1].

6) A copy of the completed Form R-1 with the completed FFSA FormForm NB-403 attached may be registered with the National Board, and when required, filed with the Jurisdiction where the item was installed.

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 their Repair Inspector and 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";

5.7.2 STAMPING REQUIREMENTS FOR REPAIRS

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

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

c) Stamping or ~~nameplate~~ repair name plate shall be applied adjacent to the original manufacturer's stamping or repair name ~~name~~plate. A single ~~repair~~repair name ~~name~~plate or stamping may be used for more than one ~~repair~~repair to a pressure-retaining item, provided each is carried out by the same certificate holder. The date of each repair, corresponding with the date on associated Form R-1, shall be stamped on the repair name ~~name~~plate.

5.7.3 STAMPING REQUIREMENTS FOR ALTERATIONS

Pressure-retaining items altered in accordance with this code shall have a ~~name~~repair name plate or stamping applied adjacent to the original manufacturer's stamping or ~~name~~repair name plate in accordance with this section. For an alteration where physical changes are made to the pressure-retaining item, the "R" Certificate Holder responsible for the construction portion of the alteration shall apply the stamping or ~~name~~repair name plate. For an alteration where no physical changes are made to the pressure-

retaining item (e.g., a re-rating) the “R” Certificate Holder, assuming responsibility for the design, shall apply the stamping or ~~name~~repair name plate.

5.7.4 STAMPING REQUIREMENTS FOR PARTS

Stamping or ~~name~~repair name plate shall be applied in a conspicuous location on the part.

5.7.5 SPECIFIC REQUIREMENTS FOR STAMPING AND ~~NAME~~REPAIR NAME PLATES

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

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

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

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

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

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

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

1) Welding
2) Adhesive, bonding or cementing
3) Tamper-resistant mechanical fasteners of suitable metal construction

Subject: NBIC Part 3, Qualification of Weld Procedures by Multiple Organizations

Proposal: To add words to 2.2.1 permitting simultaneous qualification of weld procedures by more than one organization.

Explanation: Cost of qualification of weld procedures can represent a considerable cost for a manufacturer for labor, materials, testing etc. Further, when new materials are being introduced to the industry, availability can be extremely limited. Section IX will introduce new rules (already board approved) under item 18-555 (provided in the background information), which provides the framework to allow multiple organizations to supervise the welding of a single test coupon. The rules only permit this when it is expressly permitted by the referencing code. This proposal intends to add words to 2.2.1 of Part 3 to allow Manufacturers to take advantage of the new rules coming to Section IX.

Such testing sessions have already taken place, organized by EPRI, for qualification of repair procedures for Welding Method 6 and Supplement 8.

Current Wording	Proposed Wording
2.2.1 PROCEDURE SPECIFICATIONS A procedure specification is a written document providing direction to the person applying the material joining process. Welding, brazing and fusing shall be performed in accordance with procedure specifications for welding (WPS), brazing (BPS), and fusing (FPS) qualified in accordance with the original code of construction or the construction standard or code selected. When this is not possible or practicable, the procedure specification may be qualified in accordance with ASME Section IX.	**2.2.1 PROCEDURE SPECIFICATIONS** A procedure specification is a written document providing direction to the person applying the material joining process. Welding, brazing and fusing shall be performed in accordance with procedure specifications for welding (WPS), brazing (BPS), and fusing (FPS) qualified in accordance with the original code of construction or the construction standard or code selected. When this is not possible or practicable, the procedure specification may be qualified in accordance with ASME Section IX. Welding procedures may be simultaneously qualified by more than one organization under the rules of ASME Section IX QG-106.4~~, provided that each organization accepts full responsibility for any such qualifications and complies with the other requirements of Section IX for documentation of welding records.~~ The ”R” Certificate Holder’s written quality control program shall include requirements for addressing the rules of Section IX QG-106.4.

ASME BPV Liaison Report

NBIC Standards Committee
July 16, 2020

ASME BPV Liaison Report

CA-1 Conformity Assessment Requirements

- *Ongoing work to:*
  - *Recognize alternative methods for applying the ASME Mark*
  - *Identify Certificate numbers on Data Plates*
  - *Incorporate Nuclear CA requirements*
- *Approved items for next edition:*
  - *Incorporate CAP-21 criteria for reapplication of the ASME Mark*
  - *Incorporate CAP-22 criteria for use of additional AIAs*
  - *Incorporate AIA accreditation requirements (from QAI-1)*
  - *Clarify permitted activities prior to issue of a Certificate*
  - *Incorporate definitions of "field site" and "temporary location"*
  - *Update PRD and PRT program references*

ASME BPV Liaison Report

QAI-1 Qualifications for Authorized Inspection

- *Case 6 approved for performance of remote inspections by the AI*
- *Action approved for AIA notification to ASME of unresolved Code or Program nonconformances*
- *QAI Conference Committee being populated with representation from accredited AIAs*
- *Work continues on a major reorganization of the QAI-1 Standard*
- *Proposed revisions to: establish eye examination requirements for Inspectors; to change "periodic" to "annual"; to clarify CI responsibilities consistent with CSP-53; and to address situations where the AIA provides both inspection and consulting services*
- *AIA accreditation requirements being transitioned to CA-1 Standard*

ASME BPV Liaison Report

BCA Items

- CAP-21 revised to permit reapplication of the ASME Mark to be witnessed by any National Board Commissioned Inspector
- CAP-23 issued to permit Designated Oversight via electronic means during times of natural disaster, public health crisis, regional instability, or government-imposed restrictions.
- Ongoing discussions regarding nameplates that imply compliance with an ASME Standard by using “ASME” without the ASME Mark
- New ASME Quality Program Standard in development, with a separate, non-product specific certification

ASME BPV Liaison Report

Related Developments

- *2021 publication planned for ASME Section XIII, in conjunction with construction book changes*
- *Follow-up actions planned with Book Sections to align coverage of field sites and temporary locations with current CA requirements*
- *Parts Fabrication Certificate Program continues to gain participation; 87 certificates issued*
- *August 16-21, 2020 ASME BPV Code meetings will be conducted virtually*

Questions / Discussion

The following listed actions are currently in process within the American Welding Society.

- The B2 committee has agreed to systematically update all published SWPS's to bring them in line with the advancements realized by the Welding Community over the last 20 years or so.
- The changes will not affect previous versions of the same SWPS. Those version are still very valid and readily useable and unless you have a specific need to replace them; I would not.
- The AWS B2 committee is in process of developing a compliment of Aluminum SWPS using both the GTAW and GMAW processes for the common grades of Aluminum.
- The B2 committee is also developing the plan to begin development of additional SWPS's for Carbon, Stainless and Low Alloy Steels using the GMAW, FCAW and SAW processes.
- At some point in the distant future, additional SWPS's will be developed addressing Notch Toughness applications (incorporating both traditional and Wave Form variables) for the common Carbon and Low Alloy Steels.

The status of the NBIC approved SWPS's is shown below:

SWPS DESIGNATION: YEAR

B2.1-1-001: 2020	B2.1-1-201: 2019	B2.1-8-214: 2012	B2.1-1/8-227: 2013
B2.1-1-002: 2020	B2.1-1-202: 2019	B2.1-8-215: 2012	B2.1-1/8-228: 2013
B2.1-1-016: 2018	B2.1-1-203: 2019	B2.1-8-216: 2012	B2.1-1/8-229: 2013
B2.1-1-017: 2018	B2.1-1-204: 2019	*B2.1-4-217: 2009	B2.1-1/8-230: 2013
*B2.1-1-018: 2005	B2.1-1-205: 2019	*B2.1-4-218: 2009	B2.1-1/8-231: 2015
B2.1-1-019: 2018	B2.1-1-206: 2019	*B2.1-4-219: 2009	**B2.1-1-232: 2020**
B2.1-1-020: 2018	B2.1-1-207: 2019	*B2.1-4-220: 2009	**B2.1-1-233: 2020**
B2.1-1-021: 2018	B2.1-1-208: 2019	*B2.1-4-221: 2009	*B2.1-1-234: 2006
B2.1-1-022: 2018	B2.1-1-209: 2019	B2.1-5A-222: 2009	*B2.1-1-235: 2006
B2.1-8-023: 2018	B2.1-1-210: 2012	B2.1-5A-223: 2009	
B2.1-8-024: 2012	B2.1-1-211: 2012	B2.1-5A-224: 2009	
B2.1-8-025: 2012	B2.1-8-212: 2012	B2.1-5A-225: 2009	
B2.1-1-027: 2018	B2.1-8-213: 2012	B2.1-5A-226: 2009	

*The updated SWPSs are currently being balloted for adoption by the B2 Committee

The long-range plan for the updated SWPSs is to group them into an ANSI approved "Stabilized Maintenance Program" exempting them from the traditional ANSI 5/10-year re-affirmation balloting requirement.

As in the past, as newly developed SWPS's are approved by the various committees, they will be offered to the NBIC for adoption.

Regards,

Jim Sekely