Date Distributed:

THE NATIONAL BOARD
OF BOILER AND PRESSURE VESSEL INSPECTORS

NATIONAL BOARD INSPECTION CODE COMMITTEE

MAIN SESSION AGENDA

Meeting of January 12th, 2023
Charleston, SC

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 Chair will call the meeting to order at 9:00 a.m. Eastern Time. For those attending in person, the meeting will be held in the Gold Ballroom on the second floor of the hotel.

2. **Introduction of Members and Visitors**

3. **Check for a Quorum**

4. **Awards/Special Recognition**
   Mr. Jim Sekely – 20 Years as a Main Committee member

5. **Announcements**
   - Breakfast will be served from 7:00 a.m. to 8:00 a.m. in the Colonial Ballroom, and lunch will be served from 11:30 a.m. to 12:30 p.m. in the Colonial Ballroom.

6. **Adoption of the Agenda**

7. **Approval of the Minutes of the July and December 2022 Meetings**
   The minutes are available for review online at https://www.nationalboard.org/Index.aspx?pageID=13&ID=18.

8. **Items Approved for 2025 NBIC**
   There are currently no items approved for the 2025 NBIC.

9. **Report of Subcommittees**

   a. **Subcommittee Installation**

      i. **Interpretations**
      There are currently no open interpretation requests for Part 1.

      ii. **Action Items – Old Business**

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:** E. Wiggins (PM), R. Spiker, R. Smith, G. Tompkins, S. Konopacki and R. Austin **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 2022 Meeting Action:** Mr. Don Patten provided a progress report for this item.		

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), D. Patten, M. Wadkinson

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

July 2022 Meeting Action: Mr. Patten provided a progress report for this item.

Item Number: 20-44	NBIC Location: Part 1	No Attachment

General Description: CW Vacuum Boilers

Subgroup: SG Installation
Task Group: R. Spiker (PM), M. Washington, M. Byrum

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

July 2022 Meeting Action: Mr. Patten provided a progress report for this item.

Item Number: 20-62	NBIC Location: Part 1, 1.4.5.1	No Attachment

General Description: Update the National Board Boiler Installation Report

Subgroup: SG Installation

Task Group: T. Clark (PM), E. Wiggins, R. Spiker, T. Creacy, P. Jennings, G. Tompkins, and D. Patten.

July 2022 Meeting Action: Mr. Patten provided a progress report for this item.

Item Number: 20-86	NBIC Location: Part 1, 2.10.1 a)	No Attachment

General Description: Testing and Acceptance: Boiling-out Procedure

Subgroup: SG Installation

Task Group: E. Wiggins (PM), D. Patten, M. Washington and S. Konopacki.

July 2022 Meeting Action: Mr. Patten provided a progress report for this item.

Item Number: 22-13	NBIC Location: Part 1, 3.8.2.2	No Attachment

General Description: Align hot water boiler thermometer requirements with ASME Section IV

Subgroup: SG Installation

Task Group: None assigned.

Explanation of Need: NBIC Part 1 does not expressly permit the use of temperature sensors or digital displays as thermometers for hot-water heating or supply boilers, even though they are permitted under ASME Section IV, HG-612. NBIC Part 1 also does not address the required temperature range of thermometers, inconsistent with ASME Section IV.

July 2022 Meeting Action: Mr. Patten provided a progress report for this item.

iii. Action Items – New Business

Item Number: 22-28	NBIC Location: Part 1, 9.1	Attachment Page 1

General Description: Pool Heater definition

Subgroup: SG Installation

Task Group: None assigned.

Explanation of Need: The NBIC Installation and Inspection Codes do not have a definition for pool heaters. There is potential for confusion regarding which NBIC requirements, if any, should apply to pool heaters.

January 2023 Meeting Action:

Item Number: 22-30	NBIC Location: Part 1, 3.6.3	Attachment Page 2

General Description: Drains in equipment rooms with heating boilers containing glycol

Subgroup: SG Installation

Task Group: None assigned.

Explanation of Need: Glycol should be disposed of in accordance with regulations. The intent of this addition to the text is to identify that drains may not be the proper way to dispose of glycol.

January 2023 Meeting Action:

Item Number: 22-31	NBIC Location: Part 1, 3.8.2.3	Attachment Page 3
General Description: Location of temperature controls **Subgroup:** SG Installation **Task Group:** None assigned. **Explanation of Need:** There is currently no requirement that the temperature controls measure the boiler temperature at or near the boiler outlet.		
January 2023 Meeting Action:		

Item Number: 22-32	NBIC Location: Part 1, 3.8.1.4 b)	Attachment Page 4
General Description: High pressure limit control requirements for fired jacketed steam kettles **Subgroup:** SG Installation **Task Group:** None assigned. **Explanation of Need:** As a safeguard to over pressurizing the fired jacketed steam kettle, the pressure range of the actuated high pressure limit control should not exceed the MAWP of the vessel.		
January 2023 Meeting Action:		

b. Subcommittee Inspection

i. Interpretations

Item Number: 22-40	NBIC Location: Part 2, 4.4.7.2	Attachment Page 5
General Description: Allowable stresses for t(required) calculation **Subgroup:** Inspection **Task Group:** None assigned. **Submitted by**: Tom Chen **Explanation of Need:** For the purpose of setting up inspection plans, especially with older equipment, we are calculating t(required) per Part 2, para 4.4.7.2. However, we would like to know if it is permissible to use the higher allowable stresses in later editions of ASME BPV Code.		
January 2023 Meeting Action:		

ii. Action Items – Old Business

TG FRP Items:

Item Number: NB16-1402	**NBIC Location: Part 2, New Supplement**	**No Attachment**

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 2022 Meeting Action: Mr. Getter provided a progress report for this item.

TG Historical Items:

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

General Description: Concern for Historical Boiler Inspections Nationwide

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

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

July 2022 Meeting Action: Mr. Getter provided a progress report for this item.

Item Number: 21-03	**NBIC Location: Part 2, S2**	**No Attachment**

General Description: Inspection of through stays and diagonal stays (submitted by David Rose)

Subgroup: Historical
Task Group: D. Rose (PM), R. Bryce, R. Forbes, & C. Jowett

Explanation of Need: The code is silent on the inspection of through stays and diagonal stays. Additionally, new repair methods are available from ASME that can be incorporated.

July 2022 Meeting Action: Mr. Getter provided a progress report for this item.

Item Number: 21-34	NBIC Location: Part 2, S2	No Attachment
General Description: Working Pressure Calculations for Curved Stayed Surfaces		
Subgroup: Historical **Task Group:** Mike Wahl (PM), R. Bryce, and T. Dillon **Background:** In January 2021, Dr. Bryce initiated the conversation with the group for this topic. He is proposing the group open an item to address working pressure calculations for curved stayed surfaces. After discussion a task group was formed		
July 2022 Meeting Action: Mr. Getter provided a progress report for this item.		

TG Locomotive Items:
There are currently no Locomotive items open for Part 2.

SG Inspection Items:

Item Number: 20-57	NBIC Location: Part 2, 4.4.1 a)	No Attachment
General Description: Evaluate revision to Part 2, 4.4 FFS scope roles and responsibilities (submitted by Mr. George Galanes). **Subgroup:** Inspection **Task Group:** M. Horbaczewski (PM) and B. Ray. **Explanation of Need:** Currently, there is confusion surrounding implementation of FFS for Part 2 inspection activities, where the FFS form is located and Part 3 activities regarding Part 3, 3.3.4.8 because it references Part 2 for FFS. In addition, we need to have a Part 2 Inspection member to be assigned to assist in the development of roles and responsibilities. **July 2022 Meeting Action:** Mr. Getter provided a progress report for this item.		

Item Number: 21-25	NBIC Location: Part 2	Attachment Page 6
General Description: Autoclave/Quick opening device PP (submitted by Kevin Hawes) **Subgroup:** Inspection **Task Group:** V. Scarcella (PM), T. Bolden, M. Horbaczewski, J. Peterson, J. Clark, W. Hackworth, M.A. Shah, C. Becker **Explanation of Need:** Upon our AIA (Intact) QRR I produced a Power point presentation on Autoclave inspections. Your NB team leader Gary Scribner suggested I forward this inspection presentation to the NB for review of content as mention of good reference material for next NBIC edition. I have attached a copy of this PP for your considerations.		
July 2022 Meeting Action: Mr. Getter provided a progress report for this item.		

Item Number: 21-47	NBIC Location: Part 2, 2.2.4 & 2.2.5	No Attachment

General Description: To provide better guidance as it relates to carbon monoxide

Subgroup: Inspection
Task Group: W. Hackworth (PM), V. Scarcella, D. Buechel, T. Barker, T. Bolden

Explanation of Need: Need to provide more comprehensive items to be reviewed to guide the inspector on carbon monoxide and combustion air.

July 2022 Meeting Action: Mr. Getter provided a progress report for this item.

Item Number: 22-03	NBIC Location: Part 2	Attachment Page 9

General Description: Create example inspection list

Subgroup: Inspection
Task Group: V. Scarcella (PM), M. Sansone, M. Mooney, T. Bolden, and D. Buechel
Submitted by: V. Scarcella

Explanation of Need: Average high and low mean failure rate has a 10 point plus gap which needs to be closed. The Chief of LA, Donnie LeSage brought up the item in COQ but resigned Part 2 due to other duties.

July 2022 Meeting Action: Mr. Getter provided a progress report for this item.

Item Number: 22-06	NBIC Location: Part 2, 3.4.9 e)	No Attachment

General Description: Part 2 task group to review Part 3 Item 21-53

Subgroup: Inspection
Task Group: None assigned.
Submitted by: D. Graf

Explanation of Need: Part 2 task group to investigate further changes to Part 2/Part 3 that could be needed because of action item 21-53.

July 2022 Meeting Action: Mr. Getter provided a progress report for this item.

Item Number: 22-22	NBIC Location: Part 2, 4.2	Attachment Page 10

General Description: Changes and additions to align with part III with in service inspections

Subgroup: Inspection
Task Group: T. Bolden (PM), J. Clark, J. Petersen, M. Sansone, B. Ray, D. Graf, and J. Mangas
Submitted By: V. Scarcella

Background Information: Several areas where part III after repair in service inspections should be aligned with part II.

July 2022 Action:
PROGRESS REPORT: Mr. Scarcella presented his proposed changes to the SC. He also presented ASME Section V, T-120 for reference showing why he was making his changes to NBIC Part 2. The committee discussed these changes thoroughly, then decided to create a task group to come up with a proposal.

iii. New Items:

Item Number: 22-26	NBIC Location: Part 2, 2.3.6.8	No Attachment
General Description: Addition of cast acrylic as a pressure vessel material **Subgroup:** Inspection **Task Group:** None assigned. **Submitted by:** J. Calvert **Explanation of Need:** Provide inspectors with the criteria necessary to competently inspect vessels like acrylic chromatography columns.		
January 2023 Meeting Action:		

Item Number: 22-37	NBIC Location: Part 2, S11.4.2.6	Attachment Page 11
General Description: Retention requirements should those of the NBIC, not the construction code. **Subgroup:** Inspection **Task Group:** None assigned. **Submitted by:** L. Ponce **Explanation of Need:** The NBIC should not refer to the ASME Code but should refer to Part 3, Table 1.5.1 where record retention for repair/alteration activity and FFS are located. The scope para.S11.1 states in part, “This Supplement provides guidelines to be followed when a finite element analysis (FEA) is submitted as part of a quantitative engineering assessment for in-service equipment, or a repair or alteration for a pressure retaining item…”		
January 2023 Meeting Action:		

Item Number: 22-38	NBIC Location: Part 2, 4.6.1 & S11.3.2 b)	Attachment Page 12
General Description: Correction to S11.3.2 b) and 4.6.1 **Subgroup:** Inspection **Task Group:** None assigned. **Submitted by:** L. Ponce **Explanation of Need:** The first part of this recommended correction is an incorrect reference in S.11.3.2 b). "4.6.1.2" does not exist and should be "4.6.1". The second part - Considering the statemen in paragraph S11.3.2 b), it seems the word 'review' in 4.6.1 should be in 'lieu' of instead of "rather". As it currently reads, 4.6.1 does not seem to provide 'justification for use of FEA rather than the rules in the code of construction' in S11.3.2 b).		
January 2023 Meeting Action:		

Item Number: 22-39	NBIC Location: Part 2, 4.4.8.7 g)	Attachment Page 13
General Description: Recommended clarification of requirements for Evaluating Local Thin Areas **Subgroup:** Inspection **Task Group:** None assigned. **Submitted by:** L. Ponce **Explanation of Need:** The existing text may lead to confusion due to a misplaced comma after 'specified' in the first sentence and no reference to what is being specified in the paragraph. The proposed text is a way to tie in the specified requirement in paragraph (f).		
January 2023 Meeting Action:		

c. Subcommittee Repairs & Alterations

i. Interpretations

Item Number: 21-79	NBIC Location: Part 3, 3.3.3 h)	Attachment Page 14
General Description: Mechanical Replacement of Shell or Head **Subgroup:** Repairs and Alterations **Task Group:** None assigned **Explanation of Need:** This interpretation and corresponding Code revision would provide clarity to NBIC users and address whether mechanical replacement of these components is considered a repair. **July 2022 Meeting Action:** Mr. Seime presented a progress report for this item.		

Item Number: 22-14	NBIC Location: Part 3, 3.2.2 b) and c)	Attachment Page 15
General Description: Overlaid Replacement Parts **Subgroup:** Repairs and Alterations **Task Group:** T. McBee (PM), M. Carlson **Explanation of Need:** Replacement parts that are documented using a Manufacturer's Partial Data report that have been inspected by an Authorized Inspector may still be supplied as a replacement part under paragraph 3.2.2 b) and therefore not require a Hydro test per Paragraph 3.2.2 e). Panels made from Overlaid tubes and for single overlaid tube Dutchman that contain only weld overlay, where the overlay is not considered to be pressure retaining when the overlay is not considered part of the strength of the boiler tube per ASME Section I PW-44. May be supplied as replacement parts under paragraph 3.2.2 b). The purpose of the overlay is to extend the life of boiler tubes in the waste to energy corrosive environment from external wear. **July 2022 Meeting Action:** Mr. Seime presented a progress report for this item.		

ii. New Interpretation Requests:

Item Number: I22-24	**NBIC Location: Part 3, 3.3.4.8**	**Attachment Page 18**

General Description: Repair of pressure ret'ing items without complete removal of defect

Subgroup: Repairs and Alterations

Task Group: M. Quisenberry (PM), L. Dutra

Explanation of Need: 3.3.4.8 does imply that the defect should be known in regards to characteristics such as orientation, nature, depth, configuration but does not fully state this.

January 2023 Meeting Action:

Item Number: I22-25	**NBIC Location: Part 3, 3.3.2 e) 5)**	**Attachment Page 19**

General Description: ASME Section I Watertube Boilers – Plugging Tubes

Subgroup: Repairs and Alterations

Task Group: D. Kinney (PM), R. Derby

Explanation of Need: The last item in paragraph 3.3.2 e) reads, "5) Seal welding a mechanical connection for leak tightness where by design, the pressure retaining capability is not dependent on the weld for strength and requires no PWHT." A repair organization used this paragraph as justification to document a seal welded tube plug on a watertube boiler as routine.

January 2023 Meeting Action:

Item Number: I22-33	**NBIC Location: Part 3, 3.4.3**	**Attachment Page 20**

General Description: Encapsulation of Shells and Heads

Subgroup: Repairs and Alterations

Task Group: M. Quisenberry (PM), R. Derby

Explanation of Need: The last item in paragraph 3.3.2 e) reads, "5) Seal welding a mechanical connection for leak tightness where by design, the pressure retaining capability is not dependent on the weld for strength and requires no PWHT." A repair organization used this paragraph as justification to document a seal welded tube plug on a watertube boiler as routine.

January 2023 Meeting Action:

iii. Action Items – Old Business

TG Graphite Items:

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 2022 Meeting Action:** Mr. Aaron Viet presented a progress report 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 2022 Meeting Action:** Mr. Aaron Viet presented a progress report for this item.		

TG FRP Items:

There are currently no FRP items open for Part 3.

TG Historical Items:

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, L. Moedinger, & 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 2022 Meeting Action:** Ms. Kathy Moore presented a progress report for this item.		

Item Number: 21-09	NBIC Location: Part 3, S2	No Attachment

General Description: Incorporate new repair methods for through and diagonal stays

Subgroup: Historical

Task Group: D. Rose (PM), R. Bryce, R. Forbes, & C. Jowett

Explanation of Need: The code is silent on the inspection of through stays and diagonal stays. Additionally new repair methods are available from ASME that can be incorporated.

July 2022 Meeting Action: Ms. Moore presented a progress report for this item.

TG Locomotive Items:

There are currently no Locomotive items open for Part 3.

NR Task Group Items:

Item Number: 21-02	NBIC Location: Part 3, 1.6	Attachment Page 32

General Description: Define "Fuel Loading" as it pertains to NR activities

Subgroup: Repairs and Alterations

Task Group: P. Edwards (PM)

Explanation of Need: The NR TG would like to clarify "Fuel Loading" as used to determine Category 1, 2 or 3 NR activities.

July 2022 Meeting Action: Mr. Schaefer presented the proposal for this item. A motion was made and seconded to approve the proposal as presented. A question was asked about changing references to ASME Section XI to ASME Section XI, Division 1. Mr. Schaefer said the change will be made. Mr. Wielgoszinski gave background info on the fuel loading change. After discussion, it was decided that this item will go back to the NR Task Group for further work.

Item Number: 21-37	NBIC Location: Part 3, 1.6	Attachment Page 36

General Description: Parts used in NR Activities

Subgroup: Repairs and Alterations

Task Group: B. Wielgoszinski (PM)

Explanation of Need: Clarification that parts used in NR activities are fabricated by NR Certificate Holders and inspected by appropriately endorsed National Board commissioned Inspectors.

July 2022 Meeting Action: Ms. Moore presented a progress report for this item.

Item Number: A22-29	NBIC Location: Part 3, 1.6.6.2 s) & 1.6.7.2 s)	No Attachment

General Description: Removal of the requirement of AIA audits from the NR program

Subgroup: Repairs and Alterations

Task Group: R. Spuhl (PM)

Explanation of Need: This requirement cannot be enforced and is not defined by the the NR Certificate Holder and therefore must be removed.

January 2023 Meeting Action:

SG Repairs & Alterations Items:

Item Number: 20-67	NBIC Location: Part 3, S6	Attachment Page 21

General Description: Revisions to Part 3, Supplement 6

Subgroup: Repairs and Alterations
Task Group: R. Underwood (PM)

Explanation of Need: Supplement 6 was implemented into the 2007 Edition of the NBIC Part 3 to provide requirements and guidelines for repairs, alterations and modifications to DOT Transport Tanks using the National Board's "TR" Program (which was never implemented). S6 has been revised over the years to remove reference to the "TR" Program, but still contains many requirements that are not correct. This purpose of this proposal is to review the entire Supplement and make appropriate revisions that comply with NBIC Part 3 and DOT requirements.

July 2022 Meeting Action: Ms. Moore presented a progress report for this item.

Item Number: 21-12	NBIC Location: Part 3, 3.3.3, 3.4.4, Section 9	Attachment Page 33

General Description: Clarify the definitions and examples of "Repair" and "Alteration"

Subgroup: Repairs and Alterations

Task Group: P. Becker (PM), K. Moore, P. Shanks, R. Underwood, M. Chestnut, T. Sieme

Explanation of Need: Clarify the definitions of "Repair" and "Alteration" in the Glossary and revise the list of examples of each to better define the allowable scope of activities.

History: This Item was created as a result of conversation regarding Interp. Item 20-78 and Action Item 20-54

July 2022 Meeting Action: Ms. Moore presented a progress report for this item.

Item Number: 21-31	NBIC Location: NBIC Glossary	No Attachment

General Description: Revise definition of "Field"

Subgroup: Repairs and Alterations

Task Group: R. Miletti (PM), P. Gilston, M. Toth, J. Walker

Explanation of Need: A "Field" site under the current definition could be multiple rented or leased spaces used for repairs/alterations, where there is no single or specific customer or job, but rather the locations(s) are used for conducting repair/alteration activities by personnel employed by the Certificate Holder on a continual basis.

July 2022 Meeting Action: Ms. Moore presented a progress report for this item.

Item Number: 21-43	NBIC Location: Part 3, Glossary	Attachment Page 37

General Description: Defining and revising "Practicable" and "Practical" within the NBIC

Subgroup: Repairs and Alterations

Task Group: M. Toth (PM)

Explanation of Need: Defining and revising Practicable and Practical within the NBIC and revising where applicable

July 2022 Meeting Action: Ms. Moore presented a progress report for this item.

Item Number: 21-44	NBIC Location: Part 3, Glossary	Attachment Page 38

General Description: Defining "De-Rating" within Part 3

Subgroup: Repairs and Alterations

Task Group: M. Toth (PM)

Explanation of Need: Defining de-rating within Part 3

July 2022 Meeting Action: Ms. Moore presented a progress report for this item.

Item Number: 21-45	NBIC Location: Part 3, Supplements	Attachment Page 41

General Description: Add a supplement to address oil, gas and chemical repair & alteration scope

Subgroup: Repairs and Alterations

Task Group: R. Underwood (PM)

Explanation of Need: There has been interest from companies operating with the Oil, Gas and Chemical industries to address certain types of repairs that may exist in ASME PCC-2 or API. NBIC does not have many of these repair methods within the book.

July 2022 Meeting Action: Ms. Moore presented a progress report for this item.

Item Number: 21-53	NBIC Location: Part 3, S8.5 a)	Attachment Page 43

General Description: Post Repair Inspection of weld repairs to CSEF steels

Subgroup: Repairs and Alterations

Task Group: P. Gilston (PM)

Explanation of Need: The requirement for Inspector involvement in post-repair inspections to CSEF weld repairs is to ensure future safe operation of the boiler. This is a function of the inservice Authorized Inspection Agency, not the Repair Inspector, whose duties end with completion of repair documentation.

July 2022 Meeting Action: Ms. Moore presented a progress report for this item.

Item Number: 21-67	NBIC Location: Part 3, 3.4.9	No Attachment

General Description: Add welding requirements to plugging firetubes

Subgroup: Repairs and Alterations

Task Group: P. Gilston (PM), K. Moore, Trevor Seime, M. Quisenberry

Explanation of Need: The current NBIC does not have enough direction or requirements for welding tube plugs in firetubes.

July 2022 Meeting Action: Ms. Moore presented a progress report for this item.

Item Number: 21-82	NBIC Location: Part 3, 3.3.3 s)	No Attachment

General Description: Examples of Repairs

Subgroup: Repairs and Alterations

Task Group: P. Davis (PM), R. Underwood, P. Gilston, , J. Ferreira, J. Walker, E. Cutlip, P. Miller, L. Dutra

Explanation of Need: Adding "repair" to 3.3.3(s) would then address use of different weld material. Currently 3.3.3(s) only addresses replacement of the part, not repair (Repair is addressed in 3.3.3(r)).

July 2022 Meeting Action: Ms. Moore presented a progress report for this item

Item Number: A22-02	NBIC Location: Part 3, 3.3.2 e) 1)	No Attachment

General Description: Part 4 Item A21-83 may impact part 3, 3.3.2 e) 1)

Subgroup: Repairs and Alterations

Task Group: M. Toth (PM), B. Derby, L. Dutra, M. Carlson

Explanation of Need: Part 4 Item A21-83 was reviewed as it may impact part 3, 3.3.2 e) 1) examples of Routine Repairs. An Item for Part 3 will be opened to address "valve" repairs as they relate to SRVs.

July 2022 Meeting Action: Ms. Moore presented a progress report for this item.

Item Number: A22-12	NBIC Location: Part 3, 3.3.5.2 & 3.4.5.1	Attachment Page 45

General Description: Lost or Destroyed UDS

Subgroup: Repairs and Alterations

Task Group: T. Seime (PM)

Explanation of Need: To provide the ability to repair/alter these vessels with a reconstructed UDS.

July 2022 Meeting Action: Mr. Seime presented the proposal for this item. Discussion was held on who will handle recreating the UDS; can it be done by the R stamp holder or an ASME certificate holder? Can you use MDR to generate the UDS? A vote was taken, and none of the members voiced a vote. Mr. Galanes asked for the proposal to be sent for out for a Review and Comment ballot to get feedback from the Main Committee members. The proposal will be sent back to the subgroup for further work.

Item Number: A22-18	NBIC Location: Part 3, 9.1 (and all other Parts)	Attachment Page 47

General Description: Definition of blowdown and blowoff

Subgroup: Repairs and Alterations

Task Group: K. Moore (PM)

Explanation of Need: These terms are not consistently used throughout the industry. This is to provide guidance to use the correct term when addressing the equipment or the action.

July 2022 Meeting Action: Ms. Moore presented a progress report for this item.

Item Number: A22-19	NBIC Location: Part 3, 5.5.2	No Attachment

General Description: R Certificate Holders with Design Only Scope

Subgroup: Repairs and Alterations

Task Group: None assigned.

Explanation of Need: To add new paragraphs 5.2.2 d) and 5.2.2 e) which will provide guidance for R Certificate Holders with "Design Only" on which activities they are permitted to perform and how they and the Inspectors shall complete the R-2 Form.

July 2022 Meeting Action: Ms. Moore presented a progress report for this item.

iv. New Items:

Item Number: A22-27	NBIC Location: Part 3	Attachment Page 48

General Description: Post Repair Activity - Boil Out

Subgroup: Repairs and Alterations

Task Group: None assigned.

Explanation of Need: When major repairs are made and the boiler is not properly cleaned of oils, it will cause water level instability and carryover.

January 2023 Meeting Action:

Item Number: A22-29	NBIC Location: Part 3	Attachment Page 49

General Description: Removal of the requirement of AIA audits from the NR program

Subgroup: Repairs and Alterations

Task Group: R. Spuhl (PM)

Explanation of Need: This requirement cannot be enforced and is not defined by the the NR Certificate Holder and therefore must be removed.

January 2023 Meeting Action:

Item Number: A22-41	NBIC Location: Part 3, 1.5	Attachment Page 50

General Description: Reference NB-415 in Quality System

Subgroup: Repairs and Alterations

Task Group: None assigned.

Explanation of Need: Requirements in the NB-415 should be included in the R Cert. Holder's QC Manual. Examples: a) Notifying the National Board when an organization changes scope, ownership, name, location, address, or Inspection Agreement and b) Return of the stamp.

January 2023 Meeting Action:

d. Subcommittee Pressure Relief Devices

i. Interpretations

Item Number: 22-36	NBIC Location: Part 4, 4.2.2	Attachment Page 54

General Description: Use of Code case 2787 in Repairs

Task Group: None assigned.

Explanation of Need: Code Case 2787 was approved by ASME to allow a manufacturer to develop valves that will work on multimedia applications without any required adjustments. These valves may have different components and will have multiple certified capacities. As these valves are entering the marketplace, some customers are requesting that their existing valves get converted to the multimedia type valves. This request would allow the NBIC Committee to adopt the Code Case for us in the VR program in accordance with NBIC Part 4.2.2 and allow the VR holder to convert a valve to a multimedia design that has more than one certified capacity on the valve nameplate.

January 2023 Meeting Action:

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ii. Action Items – Old Business

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 2022 Meeting Action: Ms. Brodeur stated that work is still being done on this item.

Item Number: NB15-0307	NBIC Location: Part 4	Attachment Page 55-88

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 2022 Meeting Action: Ms. Brodeur stated that work is still being done on this item.

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 2022 Meeting Action: Ms. Brodeur stated that work is still being done on this item.

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 2022 Meeting Action: Ms. Brodeur stated that work is still being done on this item.

Item Number: 20-85	NBIC Location: Part 4, 3.2.6	No Attachment

General Description: Add language to Part 4, 3.2.6 to define test intervals for thermal fluid heater PRDs

Subgroup: PRD

Task Group: B. Nutter (PM), T. Patel, D. Schirmer, J. Wolf

Explanation of Need: The proposed language comes from work done on action item 19-88.

July 2022 Meeting Action: Ms. Brodeur stated that work is still being done on this item.

Item Number: 21-08	NBIC Location: Part 4, S4.4	No Attachment

General Description: Additional guidance for tank vent repairs

Subgroup: PRD

Task Group: D. DeMichael (PM), B. Donalson, B. Nutter, K. Beise, J. Grace

Explanation of Need: The recently approved S4.4, "Weight Loaded Vents," provided new guidance for tank vent repairs. Several additional topics need to be addressed to enhance the guidance. These topics include: 1) Suggested test equipment and configuration for the prescribed tank vent testing. 2) Minimum requirements for replacement parts, 3) Guidance for painting tank vent components.

July 2022 Meeting Action: Ms. Brodeur stated that work is still being done on this item.

Item Number: 21-18	NBIC Location: Part 4, 3.2.6	No Attachment

General Description: Pressure Tests for Pressure Relief Valve Repair Parts

Subgroup: PRD

Task Group: J. Simms (PM), T. Tarbay, A. Donaldson, D. DeMichael, T. Patel, B. Nutter

Explanation of Need: Pressure relief valve manufacturers must produce valve parts that comply with ASME Code requirements to be able to apply the ASME Symbol Stamp and Designator to a new valve. These parts are the same that are sold as repair parts. The logistic issues to fabricate and maintain an inventory of spare parts not complying with ASME Code requirements is significant versus producing all parts in compliance with code. Consequently, why have a pressure test requirement for parts purchased from the valve manufacturer for those certificate holders who chose to buy parts produced by the manufacturer?

July 2022 Meeting Action: Ms. Brodeur stated that work is still being done on this item.

Item Number: 21-36	NBIC Location: Part 4, 3.3.3.4 i)	No Attachment

General Description: Add Test Details to NBIC Part 4, 3.3.3.4 i) Valve Adjustment and Sealing

Subgroup: PRD

Task Group: None assigned

Explanation of Need: There is no reference in the T/O requirements for Set Pressure Testing, use of proper Test Fluid or Seat Tightness unless and until a minor adjustment is required. This is surely the intent, but it is not clearly specified as it is in the current VR requirements.

July 2022 Meeting Action: Ms. Brodeur stated that work is still being done on this item.

Item Number: 21-59	NBIC Location: Part 4, 3.2.6.1	No Attachment

General Description: Deferral of inspection due dates (pressure relieving devices NBIC PART IV)

Subgroup: PRD
Task Group: None assigned

Explanation of Need: Since the code has clearly recommended inspection frequency intervals for the different classes of pressure relief devices, it shall have the requirements related to the deferral of due dates. The inspection due date deferrals are usually not considered but in exceptional cases where operating plant may not be able to handover the device due to some practical limitations or the turnaround frequency of the plant is extended due to stakeholders' requirements etc. The owner is usually ensuring that a deferment is not posing any significant EHSS risk by proper risk analysis but a clarity from code on the minimum or maximum duration the device can be deferred will add a great value in decision making. There are some codes which have added deferment clauses such as API 510 but the NBIC is always having precedence in this subject and shall have statement added to its code.

July 2022 Meeting Action: Ms. Brodeur stated that work is still being done on this item.

Item Number: 21-61	NBIC Location: Part 4, 3.3.4	No Attachment

General Description: Audit Requirements for the T/O holder

Subgroup: PRD
Task Group: A. Donaldson (PM), A. Cox, J. Simms, P. Dhobi, T. Tarbay, D. Marek

Explanation of Need: Opened as a result of a Subgroup PRD ballot comment from item 21-05 (Shop audits for VR certificate holders). The comment recommended adding requirements specifically for organizations that are T/O only.

July 2022 Meeting Action: Ms. Brodeur stated that work is still being done on this item.

Item Number: 21-62	NBIC Location: Part 4, 4.8.5.4 i) 3)	No Attachment

General Description: Verification of existing spring during repair activities

Task Group: A. Donaldson (PM), B. Nutter, E. Creaser, P. Dhobi, T. Patel, J. Simms

Explanation of Need: This requirement has created an administrative requirement that potentially prevents a VR Stamp holder from applying the "VR" stamp to valves they have repaired. The requirement is negatively impacting owners, and jurisdictions that enforce the NBIC Part 4. This clause introduces a unique requirement in the BPV industry to confirm that code material in a Code stamped item be verified and traceable at all time after the item is ASME code stamped but the verification can only be provided by the manufacturer. Historically, any valve received or worked on that was sealed by a VR Stamp holder or in the case of an initial repair the ASME assembler was deemed to be Code compliant, and no further verification was needed recognizing the validity and continuity of the ASME and VR quality programs. It is clearly understood that if a spring, or any other critical part is deemed necessary to be replaced during a repair the manufactures verification is required and justifiable.

July 2022 Meeting Action: Ms. Brodeur stated that work is still being done on this item.

Item Number: 22-08	NBIC Location: Part 4, 2.4.1.6 & 2.4.4.2; Part 1, 3.9.1.6 & 3.9.4.2	No Attachment

General Description: Review and improve guidance for T&P valve installation relating to probe.

Subgroup: PRD

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

Explanation of Need: Existing text refers to location of valve connection and does not give guidance that the temperature probe needs to be located in the hottest water in the tank for the valve to actuate at the specified temperature.

July 2022 Meeting Action: Ms. Brodeur stated that work is being done on this item.

Item Number: 22-09	NBIC Location: Part 4, 4.6.1	No Attachment

General Description: Add language to NBIC Part for valves manufactured to Code Case 2787

Subgroup: PRD

Task Group: A. Donaldson (PM), R. Donalson, B. Nutter, T. Tarbay, J. Simms
Explanation of Need: There are no requirements to address valve repairs that were manufactured or assembled to Code Case 2787 (use of more than one certified capacity on the pressure relief valve or the nameplate).

July 2022 Meeting Action: Ms. Brodeur stated that work is being done on this item.

Item Number: 22-15	NBIC Location: Part 4, 2.4.5 and Part 1, 3.9.5	No Attachment

General Description: What is the meaning of "service limitations" as used in Part 4, 2.4.5?

Subgroup: PRD

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

Explanation of Need: Part 4, 2.4.5 (also Part 1, 3.9.5) references "service limitations set forth in Part 1, 3.2, Definitions" when establishing pressure relief requirements for tanks and heat exchangers. Part 1, 3.2 points readers to the glossary. As "service limitations" is not itself defined within the glossary, and the term does not appear elsewhere in the code, what specific service limitations are being referenced?

July 2022 Meeting Action: Ms. Brodeur stated that work is being done on this item.

Item Number: 22-16	NBIC Location: Part 4, 2.4.4 and Part 1, 3.9.4	No Attachment

General Description: Allow the use of pressure relief valves on potable water heaters.

Subgroup: PRD

Task Group: D. Sullivan (PM), J. Ball, T. Clark

Explanation of Need: ASME Section IV, Part HLW-800.1 allows the use of pressure relief valves in place of temperature and pressure relief valves on potable water heaters. NBIC Parts 1 and 4 specifically require temperature and pressure relief valves, which is not consistent with the code of construction. Some manufacturers are shipping HLW stamped potable water heaters with pressure relief valves. Often the physical construction of these units is such that a temperature and pressure relief valve cannot be accommodated.

July 2022 Meeting Action: Ms. Brodeur stated that work is being done on this item.

Item Number: 22-20	NBIC Location: Part 4, 4.7.4	Attachment Page 89-91

General Description: Inspection and testing of PRV's located above isolation valves.

Subgroup: PRD

Task Group: D. Marek (PM), K. Beise, J. Ball, E. Creaser, H. Cornett, A. Renaldo

Explanation of Need: Add requirement to make sure the internals of a PRV inlet and outlet are inspected when it is tested, and require tests to be done with a pressure vessel with volume.

July 2022 Meeting Action: Ms. Brodeur stated that work is being done on this item.

iii. New Items:

Item Number: 22-34	NBIC Location: Part 4, S6.3 & S6.5	Attachment page 92

General Description: Update duplicate nameplate marking requirements in Supplement 6

Subgroup: PRD

Task Group: None assigned.

Explanation of Need: With the publication of Section XIII updates to the duplicate nameplate requirements were needed to refer to designator rather than code section. This item will also make the marking requirements consistent with those in the pending publication of updated paragraph 4.7.4 resulting from item 21-84.

January 2023 Meeting Action:

Item Number: 22-35	NBIC Location: Part 4, 4.6.2	Attachment page 93

General Description: Update reference of Section VIII steam valves to UV designated steam valves

Subgroup: PRD

Task Group: None assigned.

Explanation of Need: With the publication of Section XIII new UV designated valves are constructed to Section XIII. The references should be to UV designator not code section.

January 2023 Meeting Action:

10. Liaison Activities

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

ii. American Welding Society (AWS)
Mr. Jim Sekely will provide a report for the Committee.

11. Future Meetings

- July 2023 – St. Louis, MO
- January 2024 – Charlotte, NC

12. Adjournment

Respectfully submitted,

Jonathan Ellis

Jonathan Ellis
NBIC Secretary

THE NATIONAL BOARD
OF BOILER AND PRESSURE VESSEL INSPECTORS

NATIONAL BOARD INSPECTION CODE COMMITTEE

ATTACHMENTS

THE NATIONAL BOARD
OF BOILER AND PRESSURE VESSEL INSPECTORS

PROPOSED REVISION OR ADDITION

Item No.

A 22-28

Subject/Title

Pool Heater definition

NBIC Location

Part: Installation & Inspection; Section: 9 & 9; Paragraph: 9.1 & 9.1

Project Manager and Task Group

Source (Name/Email)

Jeff Kleiss / jkleiss@lochinvar.com

Statement of Need

The NBIC Installation and Inspection Codes do not have a definition for pool heaters. There is potential for confusion regarding what if any of the NBIC requirements should apply to pool heaters.

Background Information

Pool heaters may heat pools directly or indirectly. Direct pool heaters are not isolated from the pool and are directly connected to an open vessel (the pool). Indirect pool heaters heat the pool water through an indirectly through a heat exchanger and are part of a closed loop. Indirect pool heaters effectively meet the definition of a hot-water supply boiler.

Existing Text

Proposed Text

Pool heater — An appliance designed for heating non-potable water stored at atmospheric pressure, such as water in swimming pools, spas, hot tubs, or similar applications. Direct type — A pool heater in which the heat exchange between the combustion process and the pool water is completed in a single stage. Indirect type — A pool heater that utilizes water in a primary heat exchanger to transmit heat from the gas combustion process by means of a secondary heat exchanger to the pool water. An indirect pool heat is a Hot-Water Heating Boiler.

	VOTE:						
COMMITTEE	Approved	Disapproved	Abstained	Not Voting	Passed	Failed	Date

PROPOSED REVISION OR ADDITION

Item No.

A 22-30

Subject/Title

Drains in equipment rooms with heating boilers containing glycol.

NBIC Location

Part: Installation; Section: 3; Paragraph: 3.6.3

Project Manager and Task Group

Source (Name/Email)

Patrick Jennings / patrick_jennings@hsb.com

Statement of Need

Glycol should be disposed of in accordance with regulations. The intent of this addition to the text is to identify that drains may not be the proper way to dispose of glycol.

Background Information

There are different types of glycol that can be used for heating boilers, some toxic, some non-toxic.

Existing Text

Unobstructed floor drains, properly located in the equipment room, will facilitate proper cleaning of the equipment room. Floor drains that are used infrequently should have water poured into them periodically to prevent the entrance of sewer gasses and odors. If there is a possibility of freezing, an environmentally safe antifreeze mixture should be used in the drain traps. Drains receiving blowdown water should be connected to the sanitary sewer by way of an acceptable blowdown tank or separator or an air gap that will allow the blowdown water to cool to at least 140°F (60°C) and reduce the pressure to 5 psig (34 kPa) or less.

Proposed Text

ADDITION: For equipment rooms with heating boilers that use glycol, provide for the disposal of glycol in accordance with applicable regulations.

	VOTE:						
COMMITTEE	Approved	Disapproved	Abstained	Not Voting	Passed	Failed	Date

PROPOSED REVISION OR ADDITION

Item No.

A 22-31

Subject/Title

Location of temperature controls

NBIC Location

Part: Installation; Section: 3; Paragraph: 3.8.2.3

Project Manager and Task Group

Source (Name/Email)

Patrick Jennings / patrick_jennings@hsb.com

Statement of Need

There is currently no requirement that the temperature controls measure the boiler temperature at or near the boiler outlet.

Background Information

To be consistent, the proposed text is taken from 3.8.2.2 Thermometers with the exception that "sense" replaces the word "indicate".

Existing Text

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 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 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).

Proposed Text

.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. The temperature controls shall be so located that it shall at all times sense the temperature of the water in the boiler at or near the outlet.

	VOTE:						
COMMITTEE	Approved	Disapproved	Abstained	Not Voting	Passed	Failed	Date

PROPOSED REVISION OR ADDITION

Item No.

A 22-32

Subject/Title

High pressure limit control requirements for fired jacketed steam kettles

NBIC Location

Part: Installation; Section: 3.8.1.4 PRESSURE CONTROL; Paragraph: b

Project Manager and Task Group

Source (Name/Email)

Ken Barkdoll / oswc157@yahoo.com

Statement of Need

As a safeguard to over pressurizing the fired jacketed steam kettle, the pressure range of the actuated high pressure limit control should not exceed the MAWP of the vessel.

Background Information

It is common to find fired jacketed kettles that have pressure limiting setpoints that exceed the MAWP of the vessel. When testing the operation of the pressure limiting controls it is common practice to adjust the set point down to verify control operation and setpoint accuracy. Having a setpoint limit that exceeds the MAWP of the vessel present a risk exposure of adjusting the set point too high by accident. Requiring the control to be constructed or limited to as to prevent a prevent the set point from exceeding the MAWP of the vessel would reduce the risk exposure of over firing the vessel. The pressure relief valves on jacketed kettles are often exposed to harsh conditions, oils, contaminant and neglect. Ensuring that the actuated high pressure limit control is not able to be set above the MAWP of the pressure vessel will help to safeguard against over pressurizing the fired jacketed steam kettle.

Existing Text

Proposed Text

Each individual automatically fired, fired jacketed steam kettle shall have a safety limit control, that will cut off the fuel supply to prevent steam pressure from exceeding the MAWP of the Kettle. Each control shall be constructed or limited to prevent a pressure setting above the MAWP of the kettle.

	VOTE:						
COMMITTEE	Approved	Disapproved	Abstained	Not Voting	Passed	Failed	Date

PROPOSED INTERPRETATION

Item No.

22-40

Subject/Title

Allowable stresses for t(required) calculation

Project Manager and Task Group

Source (Name/Email)

Tom Chen / tom.chen@chemours.com

Statement of Need

For the purpose of setting up inspection plans, especially with older equipment, we are calculating t(required) per Part 2, para 4.4.7.2. However, we would like to know if it is permissible to use the higher allowable stresses in later editions of ASME BPV Code.

Background Information

Part 3, para 3.4.2, titled "Alterations Based on Allowable Stress Values" states "...re-calculating a new minimum wall thickness for a pressure-retaining item using a later edition/addenda of the original code of construction or selected construction standard or code that permits use of higher allowable material stress values than were used in the original construction, the following requirements shall apply...". The paragraph goes on to give some requirements. It seems to imply that recalculating a new min wall thickness per new Code allowable stresses is considered an alteration. While Part 2, Para 4.4.7.2 does not reference allowable stress values, interpretation 07-13 and 95-19 states that it is permissible to use later editions of the original code of construction.

Proposed Question

Question 1: When calculating the t(required), as defined in NBIC Part 2, Para 4.4.7.2, is it permissible to use a later edition/addenda of the original code of construction? Question 2: If the reply to Question No. 1 is yes, is it permissible to use higher allowable material stress values than were used in the original construction when calculating the t(required)? Question 3: If the reply to Question No. 2 is yes, is it considered an alteration to use higher allowable material stress values than were used in the original construction to calculate the t(required) per NB23 Part 3, para 3.4.2?

Proposed Reply

Proposed Reply 1: Yes. See Interpretations 07-13 and 95-19. Proposed Reply 2: Yes, if the requirements of NB23 Part 3, paragraph 3.4.2, subparagraphs (b), (c), (d), (e), and (f) are met. Proposed Reply 3: No, unless required by the jurisdiction.

Committee's Question 1

Committee's Reply 1

Rationale

Committee's Question 2

Committee's Reply 2

Rationale

2.3.6.5 INSPECTION OF PRESSURE VESSELS WITH QUICK-ACTUATING CLOSURES

~~a)~~ This section describes guidelines for inspection of pressure vessels equipped with quick-actuating closures~~. Due to the many different designs of quick-actuating closures, potential failures of components that are not specifically covered should be considered. The scope of inspection should include areas affected by abuse or lack of maintenance and a check for inoperable or bypassed safety and warning devices~~. Pressure vessels with quick actuating closures have a higher likelihood of personnel being in close proximity of the vessel during opening. There is a higher probability of an accident while operating the enclosure.

a) Specifically, accidents have occurred because gaskets have stuck and have released suddenly when pried open. Wear and fatigue damage caused by the repetitive actuation of the mechanism and pressure cycles are also a source of accident.

b) Temperatures above that for which the quick-actuating closure was designed can have an adverse effect on the safe operation of the device. If parts are found damaged and excessive temperatures are suspected as the cause, the operating temperatures may have exceeded those temperatures recommended by the manufacturer. Rapid fluctuations in temperatures due to rapid start-up and shutdown may lead to cracks or yielding caused by excessive warping and high thermal stress. A careful observation ~~should~~ shall be made of the condition of the complete installation~~,~~. Review shall ~~including~~ include maintenance, ~~and~~training operation, and non-destructive examination records. This review shall serve as a guide in forming an opinion of the care the equipment receives. The construction history of the vessel should be established, including: year built, materials of construction, extent of postweld heat treatment, previous inspection results, and repairs or alterations performed. Any leak should be thoroughly investigated and the necessary corrective action initiated.

1) Inspection of parts and appurtenances

The owner user shall adhere to the items below, and the items shall be verified by the inspector as applicable.

a. Seating surfaces of the closure device, including but not limited to the gaskets, O-rings, or any mechanical appurtenance, shall be inspected to ensure proper alignment. ~~of the closure to the seating surface, should be inspected. This inspection can be made by using powdered chalk or any substance that will indicate that the closure is properly striking the seating surface of the vessel flange. If this method is used, a check should be made to ensure that:~~

~~1. Material used shall not contaminate the gasket or material with which it comes into contact; and~~
~~2. The substance used shall be completely removed after the examination.~~

b. The closure mechanism of the device ~~should~~ shall be inspected for freedom of movement and proper contact with the locking elements. This inspection should indicate that the movable portions of the locking mechanism are striking the locking element in such a manner that full stroke can be obtained. Inspection should be made to ensure that the seating surface of the locking mechanism is free of metal burrs and deep scars, which would indicate misalignment or improper operation. A check should be made for proper alignment of the door hinge mechanisms to ensure that adjustment screws and locking nuts are properly secured.

c. When deficiencies are noted, the following corrective actions ~~should~~ shall be initiated:

Commented [JM1]: This is an incomplete sentence

Commented [JM2]: From Vinny:
From ASME Section VIII div 1 FF-2

Commented [JM3]: From Vinny:
ASME Section VIII FF-5

Commented [JM4]: From Vinny:
ASME Section VIII FF-3 and NBIC Part II Section 3.4.1 and 3.4.9a

Commented [JM5]: Jonathan and I re-worded what Vinny has in the original document.

1. If any ~~deterioration~~ defect of the gasket, O-ring, etc., is found, the gasket, O-ring, etc., ~~should~~ shall be removed from service and replaced immediately. Replacements ~~should~~ shall be in accordance with the vessel manufacturer's specifications;
2. If any cracking or excessive wear is discovered on the closing mechanism, the owner or user ~~should~~ shall contact the original manufacturer of the device for spare parts or repair information. If this cannot be accomplished, the owner or user should contact an organization competent in quick-actuating closure design and construction prior to implementing any repairs;
3. Defective safety or warning devices ~~should~~ shall be repaired or replaced prior to further operation of the vessel;
4. Deflections, wear, or warping of the sealing surfaces may cause out-of-roundness and misalignment. The manufacturer of the closure ~~should~~ shall be contacted for acceptable tolerances for out-of-roundness and deflection; and
5. The operation of the closure device through its normal operating cycle should be observed while under control of the operator. This ~~should~~ shall indicate if the operator is following posted procedures and if the operating procedures for the vessel are adequate.
6.

2) Gages, safety devices, and controls

The owner user shall adhere to the items below, and the items shall be verified by the inspector as applicable.

Commented [JM6]: Jonathan and I re-worded what Vinny has in the original document.

~~a. The required pressure gage should be installed so that it is visible from the operating area located in such a way that the operator can accurately determine the pressure in the vessel while it is in operation. The gage dial size should be of such a diameter that it can be easily read by the operator. This gage should have a pressure range of at least 1-1/2 times, but not more than four times, the operating pressure of the vessel. There should be no intervening valve between the vessel and gage.~~

~~b.~~a. The pressure gage should be of a type that will give accurate readings, especially when there is a rapid change in pressure. It should be of rugged construction and capable of withstanding severe service conditions. Where necessary, the gage should be protected by a siphon or trap.

~~c.~~b. Pressure gages intended to measure the operating pressure in the vessel are not usually sensitive or easily read at low pressures approaching atmospheric. It may be advisable to install an auxiliary gage that reads inches of water (mm of mercury) and is intended to measure pressure from atmospheric through low pressures. This ensures that there is zero pressure in the vessel before opening. It would be necessary to protect the auxiliary ~~low-pressure~~low-pressure gage from the higher operating pressures.

~~d.~~c. Provisions should be made to calibrate pressure gages or to have them checked against a master gage as frequently as necessary.

~~e.~~d. A check should be made to ensure that the closure and its holding elements must be fully engaged in their intended operating position before pressure can be applied to the vessel. A safety interlock device ~~should~~ shall be provided that prevents the opening mechanism from operating unless the vessel is completely depressurized.

~~f.~~e. Quick-actuating closures held in position by manually operated locking devices or mechanisms, and which are subject to leakage of the vessel contents prior to disengagement of the locking elements and release of the closure, shall be provided with an audible and/or visible warning device to warn

the operator if pressure is applied to the vessel before the closure and its holding elements are fully engaged, and to warn the operator if an attempt is made to operate the locking device before the pressure within the vessel is released. Pressure tending to force the closure clear of the vessel must be released before the closure can be opened for access.

3. A Risk Based Inspection Assessment (RBIA) program, managed by the owner/user, shall be developed by a professional familiar with the design and applications of quick actuating closures. See NBIC Part 2, Section 4. The RBIA shall be made available for the review by the inspector.

Commented [JM7]: From Vinny:
See NBIC Part 2 Section 4, 4.5, 4.4.8.6, & 4.4.8.4

PART 2, SUPPLEMEN 14
LOW PRESSURE BOILER EXTERNAL INSPECTION LIST

S14.1 SCOPE

Table S14.1 is a list for guidance of a general nature and does not cover all service conditions. This list does not include all jurisdictional requirements. Use of a checklist to perform in-service inspections is recommended (1.5.1).

TABLE S14.1

NBIC Part 2 Section Reference	Inspection Component	S	U	N/A
2.2.3	General Conditions of the boiler room; lighting, ventilation, housekeeping, and general/personal safety/clearance tripping hazard			
2.2.10.6c)	Verify combustion air is supplied to the boiler room			
2.2.5	General condition/leakage of the boiler, and appurtenances; water, steam, fuel, flue and fuel train components			
2.2.10.6d)	Remote Emergency stop button			
1.5.2a) 3)	Stamping/Code Construction			
2.2.10.4	Verify gage glass reading/condition			
2.2.10.4b) - d)	Pressure gage reading/condition			
2.2.10.6l) 3)	Thermometer reading/condition			
2.5.4	Relief valve installed properly			
2.5.7	Relief valve testing			
2.5.2	Relief valve set pressure and capacity			
2.5.3	Relief valve condition			
2.2.10.6e)	Witness test of low water/flow protection devices/rating			
2.2.10.6l) 1) & 2)	Pressure and temperature controls installed			
2.2.10.6b)	Verify controls and safety devices are tested and documented			
2.2.11	Review logs and maintenance records			
1.5.4	Explain and report violations and deficiencies			

S – Satisfactory, U – Unsatisfactory, N/A – Not Applicable

Item 22-22
Bolden – November 8, 2022

4.2 NONDESTRUCTIVE EXAMINATION METHODS (NDE)

a) Listed below ~~is~~ are a variety of ~~nondestructive examination~~ NDE 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~~ shall review the methods and procedures to be employed to ensure compliance with the codes, standards and/or jurisdictional requirements.

b) ~~Generally, some form of surface preparation will be required prior to use of these examination methods.~~ The Inspector shall review the surface preparation requirements of the selected method(s) and ensure these are included in the procedure.

~~b)~~c) 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 for further evaluation of the finding. Additionally, ~~and~~ supplemental NDE~~.~~ May be used to further evaluate the finding.

~~c)~~d) ~~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.~~ NDE requirement, including: technique, the extent of coverage, procedures, personnel qualification, and acceptance criteria, shall be in accordance with the original code of construction, standard, or specification selected for the repair or alteration of the pressure-retaining item (see NBIC part 3,1.2). Where it is not possible or practical, alternative NDE methods may be used, if all other requirements are met. The alternative NDE methods shall be acceptable to the Inspector and the Jurisdiction where the pressure-retaining item is installed, where required.

e) NDE Personnel shall be qualified ~~to the requirements of ASME Section V T-120, which references national and internationally accepted standards.~~ and certified in accordance with the requirements of the original code of construction. When this is not possible, NDE personnel may be qualified and certified in accordance with their employer's written practice.

1) The employer's written practice shall be established by using ASNT SNT-TC1A, *Recommended Practice Non-destructive Testing Personnel Qualification and Certification*, or ANSI/ASNT CP-189, *Standard for Qualification and Certification of Nondestructive Testing Personnel*, as a guideline.
2) Personnel performing the examination and test methods shall have proper training and certification, as required by the owner and acceptable to the Inspector and Jurisdiction (where required). Such training and certification shall be maintained by the employer of the NDE personnel.

PROPOSED REVISION OR ADDITION

Item No.

A 22-37

Subject/Title

Retention requirements should those of the NBIC, not the construction code.

NBIC Location

Part: Inspection; Section: Supplement 11; Paragraph: S11.4.2.6

Project Manager and Task Group

Source (Name/Email)

Luis Ponce / lponce@nationalboard.org

Statement of Need

The NBIC should not refer to the ASME Code but should refer to Part 3, Table 1.5.1 where record retention for repair/alteration activity and FFS are located. The scope para.S11.1 states in part, “This Supplement provides guidelines to be followed when a finite element analysis (FEA) is submitted as part of a quantitative engineering assessment for in-service equipment, or a repair or alteration for a pressure retaining item…”

Background Information

This requested change is due to the NB Inservice Course material presented to prospective Inservice Inspectors by NB Staff Engineer, Mr. Tim Gardner.

Existing Text	Proposed Text
Refer to ASME Section VIII, Division 2, Part 2, 2.3.3.1 (c) (2) Documentation requirements of design-by-analysis calculations in Part 5.	Refer to Part 3, Table 1.5.1 for retention requirements for any analysis documents as part of a fitness for service.

	VOTE:						
COMMITTEE	Approved	Disapproved	Abstained	Not Voting	Passed	Failed	Date

PROPOSED REVISION OR ADDITION

Item No.

A 22-38

Subject/Title

Correction to S11.3.2 b) and 4.6.1

NBIC Location

Part: Inspection & Inspection; Section: Supplement 11 & 4; Paragraph: S11.3.2 b) & 4.6.1

Project Manager and Task Group

Source (Name/Email)

Luis Ponce / lponce@nationalboard.org

Statement of Need

The first part of this recommended correction is an incorrect reference in S.11.3.2 b). "4.6.1.2" does not exist and should be "4.6.1". The second part - Considering the statemen in paragraph S11.3.2 b), it seems the word 'review' in 4.6.1 should be in 'lieu' of instead of "rather". As it currently reads, 4.6.1 does not seem to provide 'justification for use of FEA rather than the rules in the code of construction' in S11.3.2 b).

Background Information

Recommended corrections and change are due to course material taught at the Inservice Commission Course by Mr. Tim Gardner.

Existing Text	**Proposed Text**
S11.3.2 b) The justification for use of FEA rather than rules in the code of construction. Refer to NBIC Part 2 4.6.1.2. 4.6.1 This section describes criteria to be considered by the Inspector in the review of calculations prior to acceptance of quantitative engineering assessments per industry standards (such as fitness-for-service) for in-service equipment, repairs, and alterations.	S11.3.2 b) The justification for use of FEA rather than rules in the code of construction. Refer to NBIC Part 2 4.6.1. 4.6.1 This section describes criteria to be considered by the Inspector in lieu of calculations prior to acceptance of quantitative engineering assessments per industry standards (such as fitness-for-service) for in-service equipment, repairs, and alterations.

	VOTE:						
COMMITTEE	Approved	Disapproved	Abstained	Not Voting	Passed	Failed	Date

PROPOSED REVISION OR ADDITION

Item No.

A 22-39

Subject/Title

Recommended clarification of requirements for Evaluating Local Thin Areas

NBIC Location

Part: Inspection; Section: 4; Paragraph: 4.4.8.7 g)

Project Manager and Task Group

Source (Name/Email)

Luis Ponce / lponce@nationalboard.org

Statement of Need

The existing text may lead to confusion due to a misplaced comma after 'specified' in the first sentence and no reference to what is being specified in the paragraph. The proposed text is a way to tie in the specified requirement in paragraph (f).

Background Information

This question was raised at a NB Inservice Commission Course during material presented by Mr. Tim Gardner.

Existing Text	Proposed Text
If metal loss is less than specified, corrosion/erosion allowance and adequate thickness is available for future corrosion, then monitoring techniques should be established. If metal loss is greater than specified corrosion/erosion allowance and repairs are not performed, and a detailed engineering evaluation shall be performed to ensure continued safe operation.	If metal loss is less than specified in paragraph (f) above and adequate thickness is available for future corrosion, then monitoring techniques should be established. If metal loss is greater than specified in paragraph (f) above and repairs are not performed, a detailed engineering evaluation shall be performed to ensure continued safe operation.

	VOTE:						
COMMITTEE	Approved	Disapproved	Abstained	Not Voting	Passed	Failed	Date

PROPOSED INTERPRETATION

Item No.

21-79

Subject/Title

Mechanical Replacement of Shell or Head

Project Manager and Task Group

Source (Name/Email)

Robert Underwood / robert_underwood@hsb.com

Statement of Need

This interpretation and corresponding Code revision would provide clarity to NBIC users and address whether mechanical replacement of these components is considered a repair.

Background Information

There are two conflicting NBIC interpretations relating to mechanical replacement of parts. Interpretation 01-29 states that NBIC neither requires nor prohibits documenting mechanical repair installation on a Form R-1. Recently passed interpretation 19-11 states that mechanical replacement of pressure retaining components in ASME Section VIII, Div. 3 vessels are considered a repair activity. 19-11 cites paragraph 3.3.3 which provides examples of repairs. Paragraph 3.3.3(h)(2) specifically states that replacement of head or shell in accordance with the original design. It does not specify whether head was replaced by welding or mechanical attachment.

Proposed Question

Is mechanical replacement of a shell or head of a pressure retaining item considered a repair activity?

Proposed Reply

Yes, see Part 3, 3.3.3(h).

Committee's Question 1

Committee's Reply 1

Rationale

Committee's Question 2

Committee's Reply 2

Rationale

PROPOSED INTERPRETATION

Item No.

22-14

Subject/Title

Overlaid Replacement Parts

Project Manager and Task Group
Tim McBee – PM, Mike Carlson, Don Kinney, Michael Quisenberry, Phil Gilston, Jon Ferreira.

Source (Name/Email)

Harold Greer / Harold.greer32@yahoo.com

Statement of Need

Replacement parts that are documented using a Manufacturer's Partial Data report that have been inspected by an Authorized Inspector may still be supplied as a replacement part under paragraph 3.2.2 b) and therefore not require a Hydro test per Paragraph 3.2.2 e). Panels made from Overlaid tubes and for single overlaid tube Dutchman that contain only weld overlay, where the overlay is not considered to be pressure retaining when the overlay is not considered part of the strength of the boiler tube per ASME Section I PW-44. May be supplied as replacement parts under paragraph 3.2.2 b). The purpose of the overlay is to extend the life of boiler tubes in the waste to energy corrosive environment from external wear.

Background Information

ASME Section I PG-112.6 states that a P-4 is neither required nor prohibited for pressure parts that do not contain pressure-retaining welds. NBIC Part 3 section 3 paragraph 3.2.2 c) .....replacement parts subject to internal or external pressure fabricated by welding, "which require inspection by an Authorized Inspector".... An inspector could interpret this as, any replacement part that is certified with a form P-4 would therefore require inspection by an Authorized Inspector and would then require a Hydro test by paragraph 3.2.2 e) prior to installation in the boiler. It is the opinion of this manufacturer that Overlaid boiler tubes where the overlay is not considered as part of the strength of the boiler tube per PW-44 of ASME Section I, is not pressure retaining. Hydro testing of Weld Overlay would not provide meaningful data and would requires excessive costs for no benefit. Such as performance of 200 hydro tests at 1.5 x MAWP for section I, for 200 Overlaid tube Dutchmen, where each tube must be witnessed by the Inspector prior to installation in a boiler. Whereas, after installation there are 400 actual pressure retaining welds in a single test at a pressure that need only verify leak tightness and the acceptance of the inspector.

Proposed Question

Q1) May a boiler furnace wall panel that contains no pressure retaining welds and has been documented on a P-4 Manufacturer's Partial Data Report in accordance with PG-112.6 of ASME Section I, be provided as a replacement part in accordance with NBIC Part 3, 3.2.2 b)? Q2) The same panel referred to in Q1 is manufactured with a weld overlay that is not part of the strength of the boiler tube (corrosion resistance, hard facing, etc…) and documented on a P4 Manufacturer's Partial Data Report in accordance with PG-112.6 of ASME Section I. May this wall panel be provided as a replacement part in accordance with NBIC Part 3, 3.2.2 b)? Q3) May overlaid boiler tubes, where the overlay is not pressure retaining and is not considered part of the strength of the boiler tube per ASME Section I , PW-44, supplied individually, may these overlaid tubes be provided as a replacement part in accordance with Paragraph 3.2.2 b)?

Proposed Reply

Q1) YES Q2) YES Q3) YES

Committee's Question 1

1. May boiler tubes or boiler tube panel assemblies with hard-facing or corrosion resistance overlay that contain no pressure retaining welds be supplied as a replacement part?

Committee's Reply 1

1. Yes.

Rationale

NBIC Part 3, paragraph 3.2.2 b).

Committee's Question 2

2. Are boiler tubes or boiler tube panel assemblies with hard-facing or corrosion resistance overlay that contain no pressure retaining welds required to be pressure tested?

Committee's Reply 2

2. No.

Rationale

NBIC Part 3, paragraph 3.2.2 e).

Committee's Question 3

3. Are boiler tubes or boiler tube panel assemblies with hard-facing or corrosion resistance overlay that contain no pressure retaining welds required to be provided with a partial data report?

Committee's Reply 3

3. No, partial data reports are neither required nor prohibited.

Rationale

NBIC Part 3, paragraph 3.2.2 c) and ASME Section I, PG-112.6.

	VOTE:						
COMMITTEE	Approved	Disapproved	Abstained	Not Voting	Passed	Failed	Date

PROPOSED INTERPRETATION

Item No.

22-24

Subject/Title

Repair of pressure ret'ing items without complete removal of defect

Project Manager and Task Group

Source (Name/Email)

Fazlollah (Fred) Afshar / fredafshar@bandmriskadvice.com

Statement of Need

3.3.4.8 does imply that the defect should be known in regards to characteristics such as orientation, nature, depth, configuration but does not fully state this.

Background Information

On a 1 1/2" thick 304 H reactor operating normally in vacuum and around 1200 degrees F, cracking is found on the lower head to shell joint. Grinding to 1 1/4" thick has eliminated more than 60% of the cracks but still in areas not accessible, the cracks do exist. Detection requires special phased array sensor that is being built but not yet available. Client is citing NB 3.3.4.8 for the cracks left in place and planning to return to operation. Question is submitted to seek the Committee's view.

Proposed Question

Q: If the size, orientation and/ or the contour of the defect may not be fully established, would the provisions of 3.3.4.8 be applicable? 3.3.4.8 Repair of pressure retaining items without complete removal of defects does not address the situation where the defect (i.e. cracks) characteristics are not fully established due to geometrical configuration of internals or other physical obstacles not allowing use of available NDE techniques to fully study the size, orientation and configuration of cracks.

Proposed Reply

No. The defect shall be validated in full for provisions of NB 3.3.4.8 to be applied.

Committee's Question 1

Committee's Reply 1

Rationale

Committee's Question 2

Committee's Reply 2

Rationale

PROPOSED INTERPRETATION

Item No.

22-25

Subject/Title

ASME Section I Watertube Boilers – Plugging Tubes

Project Manager and Task Group

Source (Name/Email)

Luis Ponce / lponce@nationalboard.org

Statement of Need

The last item in paragraph 3.3.2 e) reads, “5) Seal welding a mechanical connection for leak tightness where by-design, the pressure retaining capability is not dependent on the weld for strength and requires no PWHT.” A repair organization used this paragraph as justification to document a seal welded tube plug on a watertube boiler as routine.

Background Information

In at least one jurisdiction, a repair organization submitted a completed and certified R-1 Report of Repair Form as a “Routine Repair” to the Chief Inspector with the scenario in the statement of need. Neither the Repair firm nor the Inspector contacted the Jurisdiction prior to designating the plugging of the watertube as a “Routine Repair.”

Proposed Question

Question 1 - A leaking tube is removed on a watertube boiler, and the repair organization installs and seal welds a plug into the tube opening in the shell drum. May this work be considered a routine repair as specified in NBIC, Part 3, 3.3.2e) 5)? Question 2 - A leaking tube is not removed on a watertube boiler, and the repair organization installs and seal welds a plug into the tube material that remains in the shell drum. May this work be considered a routine repair as specified in NBIC, Part 3, 3.3.2e) 5)?

Proposed Reply

Reply 1 - No. Tube plugging is not considered a permanent repair, therefore it shall not be considered routine. Competent technical advice from the boiler manufacturer or from another qualified source shall be obtained prior to seal welding tube plugs on watertube boilers. Reply 2 - No, tube plugging is not considered a permanent repair, therefore it shall not be considered routine. Competent technical advice from the boiler manufacturer or from another qualified source shall be obtained prior to seal welding tube plugs.

Committee's Question 1

Committee's Reply 1

Rationale

Committee's Question 2

Committee's Reply 2

Rationale

PROPOSED INTERPRETATION

Item No.

22-33

Subject/Title

Encapsulation of Shells and Heads

Project Manager and Task Group

Source (Name/Email)

Robert Underwood / robert_underwood@hsb.com

Statement of Need

To clarify that encapsulation cannot be used to maintain the pressure retaining capability of shells and heads of pressure retaining items.

Background Information

A pressure vessel owner believes PCC-2 allows encapsulation of components other than what's listed in 3.4.3 of Part 3 (such as heads) and therefore it should be acceptable per the NBIC. Paragraph 3.4.3 clearly indicates that the encapsulation method only applies to pipe, nozzles, fittings, and valves. This proposal would reinforce existing wording in Part 3.

Proposed Question

Does the NBIC Part 3, paragraph 3.4.3, allow for the encapsulation of components other than pipe, nozzles, fittings, and valves?

Proposed Reply

No.

Committee's Question 1

Committee's Reply 1

Rationale

Committee's Question 2

Committee's Reply 2

Rationale

SUPPLEMENT 6
REPAIR, ALTERATION, AND MODIFICATION OF DOT TRANSPORT (CARGO) TANKS

S6.1 SCOPE

This supplement provides requirements and guidelines for repairs, alterations, or modifications to DOT Transport Tanks used for the transportation of dangerous goods via highway, rail, air, or water.

S6.2 DEFINITIONS

The definitions specified in NBIC Part 3, Section 9, *Glossary*, shall be used in conjunction with those specified in NBIC Part 2, S6.17. Where conflicts between definitions exist, those identified in NBIC Part 2, S6.17 shall take precedence.

S6.3 CONSTRUCTION STANDARDS

When the standard governing the original construction is the ASME Code or other regulations of the Competent Authority, repairs, alterations, or modifications shall conform, insofar as possible, to the edition of the construction standard or specification most applicable to the work. Where this is not possible or ~~practical~~ practicable, it is permissible to use other codes, standards or specifications, including the ASME Code provided the "R" Certificate Holder has the concurrence of the Inspector and, if required, the Competent Authority.

S6.4 ACCREDITATION AND REGISTRATION

Organizations performing repairs, alterations, or modifications shall be accredited in accordance with the National Board “R” Accreditation Program. In addition repair organizations performing repairs, alterations, or modifications to transport tanks shall be registered with DOT as required by 49 CFR Part 180.

S6.5 AUTHORIZATION

The Inspector’s authorization to perform a repair, alteration, or modification shall be obtained prior to initiation of the work to be performed on a transport tank. Additional requirements are specified in NBIC Part 3, 1.3.1 and 1.3.2.

S6.6 INSPECTION

Inspection and certification shall be made by an Inspector holding an appropriate National Board Commission as required by NBIC Part 3, 1.3.

S6.7 MODIFICATIONS

All modifications, as defined in NBIC Part 2, Supplement 6, to the pressure-retaining item shall meet the requirements of NBIC Part 3 for alterations.

S6.8 DRAWINGS AND CALCULATIONS

a) Design requirements for repairs, alterations and modifications shall comply with the requirements of NBIC Part 3, 3.2.4.

b) As appropriate, drawings or instructions shall be prepared to describe the repair, alteration, or modification. Drawings shall include sufficient information to satisfactorily perform the activity.

c) The design of alterations and modifications shall be completed by an organization experienced in the design portion of the standard used for the construction of the item and certified by a Design Certifying Engineer as defined in NBIC Part 2, S6.17. Design documents shall be completed prior to the start of any physical work and be available for review by the Inspector accepting the design.

S6.~~9~~5 MATERIALS

The materials used in making repairs, alterations, or modifications shall conform to the original code of construction including the material specification requirements. Carbon or alloy steel having a carbon ~~con-tent~~content of more than 0.35% (0.30% for ton tanks) shall not be welded unless permitted by the original code of construction. The "R" Certificate Holder is responsible for verifying the identification of existing materials from original data, drawings, or unit records and identification of the material to be installed. Materials that have previously been in service, as described in Part 3, 3.2.1 c), are not permitted for alterations or modifications of DOT Transport Tanks per 49 CFR Part 180. Additional material requirements are provided in NBIC Part 3, Section 3.

S6.~~6~~ 10 REPLACEMENT PARTS

Replacement parts to be used in repairs, alterations, and modifications of DOT Transport Tanks shall comply with the requirements provided in NBIC Part 3, 3.2.2.

~~a) Replacement parts that will be subject to internal or external pressure that consist of new material which may be formed to the required shape by spinning, forging, die forming, and on which no fabrication welding is performed shall be supplied as material. Such parts shall be marked with the material and part identification and the name or trademark of the parts manufactured. In lieu of full identification marking on the material or part, the part manufacturer may use a coded marking system traceable to the original marking. Such markings shall be considered as the part manufacturer's certification that the part complies with the original code of construction. Examples include seamless or welded tube or pipe, forged nozzles, heads or subassemblies attached mechanically.~~

~~b) Replacement parts that will be subject to internal or external pressure, that are preassembled by attachment welds, shall have the welding performed in accordance with the original code of construction. This certificate shall be supplied in the form of a bill of material or drawings with statement of certification.~~

~~c) Replacement parts subject to internal or external pressure fabricated by welding that require shop inspection by an Authorized Inspector shall be fabricated by an organization having an appropriate ASME *Certificate of Authorization*. The item shall be inspected and stamped as required by the applicable section of the ASME Code and DOT specification requirements. A completed ASME *Manufacturer's Partial Data Report* shall be supplied by the manufacturer.~~

~~d) When the original code of construction is other than ASME, replacement parts subject to internal or external pressure fabricated by welding shall be manufactured by an organization certified as required by the original code of construction. The item shall be inspected and stamped as required by the original code of construction. Certification as required by the original code of construction shall be supplied with the item. When this is not possible or practicable the organization fabricating the part may have a National Board *Certificate of Authorization*. Replacement parts fabricated by an "R" stamp holder shall be documented on Form R-3 and the "R" Stamp applied as described in NBIC Part 3, S6.15.~~

~~S6.7 AUTHORIZATION~~

~~The Inspector's written authorization to perform a repair, alteration, or modification shall be obtained prior to initiation of the work to be performed on a transport tank. Additional requirements are specified in NBIC Part 3, 1.3.1 and 1.3.2.~~

~~S6.8 INSPECTION~~

~~Inspection and certification shall be made by an Inspector holding an appropriate National Board Commission as required by NBIC Part 3, 1.3 and shall be a Registered Inspector meeting the requirements of the Competent Authority.~~

~~S6.8.1 INSPECTOR DUTIES FOR REPAIRS, ALTERATIONS, AND MODIFICATIONS~~

~~a) Inspectors performing repair, alteration, or modification inspections under the requirements of this supplement shall satisfy the requirements of S6.8.1 to be authorized to sign the Form R-1, *Repairs* and Form R-2, *Alterations*.~~

~~b) For repairs, alterations, and modifications of transport tanks, the duties of the Registered Inspector performing inspections are detailed in Part 2, S6.10 through S6.15, as required by the Competent Authority.~~

~~c) The Registered Inspector shall meet the rules of NB-263, RCI-1, Rules for Commissioned Inspectors. Additional duties are summarized below:~~

~~1) Verify the organization performing the repair, alteration or modification activity is properly accredited and in possession of a current valid *Certificate of Authorization* to apply the "R" Stamp issued by the National Board and is working to an accepted Quality Control System;~~

~~2) Verify that the design, if required, for the modification of the vessel is approved by a Design Certifying Engineer, or Designated Approval Agency or other applicable individual;~~

~~3) Verify the materials to be used to make the repair, alteration, or modification are approved for use and comply with applicable code requirements;~~

~~4) Verify the welding procedures and welders or welding operators are properly qualified;~~

~~5) Verify that all heat treatments, if required, including PWHT have been performed in accordance with the applicable standards and that the results are acceptable;~~

~~6) Verify that all NDE, impact tests, and other tests have been performed when required, and that they are acceptable;~~

~~7) Make a visual inspection of the work performed to confirm there are no visible defects or deviations from code requirements;~~

~~8) Perform external and internal visual inspections, if the vessel is equipped with a manway, and witness the hydrostatic or pneumatic pressure test and/or leak tightness test when they are required;~~

~~9) Verify the correct nameplate is properly attached to the vessel and that the current test and inspection markings are properly attached and displayed on the proper vessel;~~

~~10) Sign the Form R-1 and, as appropriate, form R-2 when work is completed.~~

S6.~~9~~ 11 WELDING

a) Welding, including procedure specification qualification, performance qualification, qualification records, qualified personnel identification, continuity of qualified personnel, and process continuity

records shall be performed in accordance with the requirements of the original code of construction used for the fabrication of the pressure vessel retaining item and Part 3, Section 2.

a)b) For hydrogen control when low alloy steel filler metals are used, the filler metal classification shall include an H4 supplemental diffusible hydrogen designator (maximum 4 ml [H2]/100 g deposited metal) for each of the following welding processes:

1) electrodes for shielded metal arc welding (SMAW) conforming to SFA-5.5;

2) electrodes and fluxes for submerged arc welding (SAW) conforming to SFA-5.26;

3) electrodes and rods for gas shielded metal arc welding (GMAW) conforming to SFA-5.28;

4) electrodes for flux-cored arc welding (FCAW) conforming to SFA 5.29.

c) Practices used for controlling storage and exposure of filler metals shall be those developed by the "R" Certificate Holder or those recommended by the filler metal manufacturer.

b)

S6.9.1 WELDING PROCEDURE SPECIFICATION

Welding shall be performed in accordance with a Welding Procedure Specification (WPS) qualified in accordance with the original code of construction. When this is not possible or practicable, the WPS may be qualified in accordance with ASME Section IX.

S6.9.2 STANDARD WELDING PROCEDURE SPECIFICATIONS

A "R" Certificate Holder may use one or more applicable *Standard Welding Procedure Specifications* shown in NBIC Part 3, 2.3 without supporting *Procedure Qualification Records* (PQRs) since SWPS are pre-qualified and the PQR will not be supplied.

S6.9.3 PERFORMANCE QUALIFICATION

Welders or welding operators shall be qualified for the welding processes that are used. Such qualification shall be in accordance with the requirements of the original code of construction or ASME Section IX. Use of Standard Welding Procedures Specification shown in NBIC Part 3.2.3 is permitted for performance qualification testing.

S6.9.4 WELDING RECORDS

The "R" Certificate Holder shall maintain a record of the results obtained in welding procedure qualification, except for those qualifications for which the provisions of NBIC Part 3, S6.8.2 are used and of the results obtained in welding performance qualifications. These records shall be certified by the "R" Certificate Holder and shall be available to the inspector.

S6.9.5 WELDERS' IDENTIFICATION

The "R" Certificate Holder shall establish a system for the assignment of a unique identification mark to each welder/welding operator qualified in accordance with the requirements of the NBIC. The "R" Certificate Holder shall also establish a written procedure whereby all welded joints can be identified as to the welder or welding operator who made them. This procedure shall use one or more of the following methods and be acceptable to the Inspector. The welder's or welding operator's identification mark may be stamped (low stress stamp) adjacent to all welded joints made by the individual or, in lieu of stamping, the "R" Certificate Holder may keep a record of the welded joints and the welders or welding operators used in making the joint.

~~S6.9.6 WELDERS' CONTINUITY~~

~~The performance qualification of a welder or welding operator shall be affected when one of the following conditions occurs:~~

~~a) When the welder or welding operator has not welded using a specific process during a period of six months or more, their qualifications for that process shall expire;~~

~~b) When there is specific reason to question their ability to make welds that meet the specification, the qualification which supports the welding that is being performed shall be revoked. All other qualifications not questioned remain in effect.~~

S6.~~10~~ 12 HEAT TREATMENT

S6.~~10~~12.1 PREHEATING

Preheating may be employed during ~~welding~~ use of a process to assist in completion of the ~~welded~~ joint Preheating shall comply with the requirements in NBIC Part 3, 2.5.1. ~~(see NBIC Part 3, 2.5.1). The need for and the temperature of preheat are dependent on a number of factors such as chemical analysis, degree of restraint of the items being joined, material thickness, and mechanical properties of the base metals being joined. The Welding Procedure Specification for the material being welded shall specify the preheat temperature requirements.~~

S6.~~10~~12.2 POSTWELD HEAT TREATMENT (PWHT)

Postweld heat treatment ~~may~~ used in repairs, alterations, and modifications of DOT Transport Tanks shall comply with the requirements provided in NBIC Part 3, 2.5.2. ~~be performed as required by the original code of construction in accordance with a written procedure. The procedure shall contain the parameters for postweld heat treatment. Local PWHT that is not specified by the original code of construction may be performed in accordance with an Alternative Postweld Heat Treatment Method described in NBIC Part 3, 2.5.2 with acceptance by the Inspector and required by the Competent Authority.~~

S6.~~10~~12.3 ALTERNATIVES TO POSTWELD HEAT TREATMENT

a) Under certain conditions, postweld heat treatment in accordance with the original code of construction may be inadvisable or impractical. In such instances, alternative methods of postweld heat treatment or special welding methods in accordance with NBIC Part 3, 2.5.3, and acceptable to the Inspector and Competent Authority may be used.

b) When the standard governing the original construction is the Code of Federal regulation for DOT/MC 331 cargo tanks for propane, butane, anhydrous ammonia, and other DOT permitted commodities, and the tanks are made to the ASME Code, Section VIII, Division 1, Part UHT, repairs, alterations, or modifications shall conform insofar as possible, to the edition of the construction standard or specification most applicable to the work. Where this is not possible or practicable, it is permissible to use other codes, standards, or specifications provided the "R" Certificate Holder has the concurrence of the DOT. Shells and heads of MC 331 cargo tanks were made from quenched and tempered alloy steel plate, SA517, Grade E (originally Code Case 1298) and Grade F (originally Code Case 1204) prior to 1994.

c) The 1994 ASME Code Addenda revised UHT-5(b) to permit the joining of UHT materials to UCS or UHA materials in head and shell sections. Propane, butane, and anhydrous ammonia are the most common transported commodities and the shipper is required by DOT to comply with certain composition limitations. Propane and butane transported must have sufficiently low hydrogen sulfide content so as not to exceed the limitations for Classification One of the ASTM D1838-74 copper strip test, and the anhydrous ammonia transported must be inhibited with a minimum water content of 0.2% by weight. In addition, such cargo tanks made for propane, butane, and anhydrous ammonia service must be postweld heat treated, unless specifically exempted by a DOT special permit that exempts PWHT.

S6.13 REPAIRS OF DEFECTS

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

b) For MC 330 and MC 331 transport tanks, when a repair is made to defects revealed by the wet fluorescent magnetic particle examination, including those repaired by grinding, the affected area of the cargo tank must again be examined by the wet fluorescent magnetic particle method after hydrostatic testing to assure that all defects have been removed.

S6.~~11~~ 14 NONDESTRUCTIVE EXAMINATION

a) The nondestructive examination (NDE) requirements, including qualification of NDE personnel shall comply with the requirements in NBIC Part 3, 4.2.~~, including technique, extent of coverage, procedures, personnel qualification, and acceptance criteria, shall be in accordance with the original code of construction used for the pressure vessel, and repairs, alterations, and modifications 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 Competent Authority may be used on a case-by-case basis.~~

~~b) NOE personnel shall be qualified and certified in accordance with the requirements of the original code of construction. When this is not possible or practicable, NDE personnel may be qualified and certified in accordance with their employer's written practice. ASNT SNT-TC-1A, *Recommended Practice for Nondestructive Testing Personnel Qualification and Certification (2006 Edition)*, or ANSI/ASNT CP-189, *Standard for Qualification and Certification of Nondestructive Testing Personnel (2006 Edition)*, shall be used as a guideline for employers to establish their written practice. The ASNT Central Certification Program (ACCP) may be used to fulfill the examination and demonstration requirements of the employer's written practice. Provisions for training, experience, qualification and certification of NDE personnel shall be described in the "R" Certificate Holder's written quality system.~~

~~S6.12 COATINGS AND LININGS~~

~~When coatings or linings are to be inspected, such inspections shall be done in accordance with the Structural Steel Painting Council, SSPC publication, No. 91-12, *Coating and Lining Inspection Manual*.~~

S6.1~~5~~3 MEASUREMENT, EXAMINATION, AND TEST EQUIPMENT

The calibration of pressure gages, measurement, examination, and test equipment, and documentation of calibration shall be performed, as required, by the applicable standard used for construction. This system shall be documented.

S6.16 PRESSURE TEST

The following requirements shall apply to all repairs, alterations, or modifications to DOT Transport Tank pressure-retaining items:

a) The integrity of repairs and replacement parts used in repairs, alterations, or modifications shall be verified by a pressure test;

b) The "R" Certificate Holder is responsible for all activities relating to the pressure test of repairs, alterations, or modifications;

S6.16.1 PRESSURE TEST METHODS

The integrity of repairs, alterations and modifications of DOT Transport Tanks shall be verified by a pressure test as described below. The test method used shall be subject to acceptance of the Inspector and the Competent Authority, when required.

a) Liquid Pressure Test

Pressure testing of repairs, alterations, and modifications of DOT Transport Tanks shall comply with NBIC Part 3, 4.4.2(a) and the following requirements:

1) Liquid pressure tests shall be conducted in accordance with the requirements of the original code of construction and the regulations of the Competent Authority at pressures established in Table S6.16. When original test pressure included consideration of corrosion allowance, the test pressure may be further adjusted based on the remaining corrosion allowance;

TABLE S6.16
PRESSURE TEST REQUIREMENTS

Cargo Tank Specification	Test Pressure
MC 300, MC 301, MC 302, MC 303, MC 305, and MC 306	20.7 kPa (3 psig) or design pressure, whichever is greater
MC 304 and MC 307	275.8 kPa (40 psig) or 1.5 times design pressure, whichever is greater
MC 310, MC 311, and MC 312	20.7 kPa (3 psig) or 1.5 times design pressure, whichever is greater
MC 330 and MC 331	1.5 times either MAWP or the re-rated pressure, whichever is applicable
MC 338	1.25 times either MAWP or the re-rated pressure, whichever is applicable
DOT 406	34.5 kPa (5 psig) or 1.5 times the MAWP, whichever is greater
DOT 407	275.8 kPa (40 psig) or 1.5 times the MAWP, whichever is greater
DOT 412	1.5 times the MAWP

Note: DOT Transport Tanks constructed in accordance with Part UHT in Section VIII, Division 1 of the ASME Code shall be tested at a pressure at least twice the transport tank design pressure.

b) Pneumatic Test

A pneumatic test may be conducted in accordance with the requirements of the original code of construction and the regulations of the Competent Authority at pressures established in Table S6.18.

Concurrence of the owner shall be obtained in addition to that of the Inspector and the Competent Authority, where required. Precautionary requirements of the original code of construction and NBIC Part 2, 6.13.6.1(c) shall be followed.

S6.174 ACCEPTANCE INSPECTION

The Inspector making the acceptance inspection shall be the same Inspector who authorized the repairs, alterations, or modifications. Where this is not possible or ~~practical~~ practicable, another Inspector may perform the acceptance inspection; however, in all cases, the Inspector who performs the acceptance inspection shall be an employee of the same organization as the Inspector who authorized the repairs, alterations, or modifications.

S6.185 GENERAL STAMPING REQUIREMENTS

The stamping of or attaching of a nameplate to a pressure-retaining item shall indicate that the work was performed in accordance with the requirements of this code and any requirements of the Competent Authority. Such stamping or attaching of a nameplate shall be done only with the knowledge and authorization of the Inspector ~~and Competent Authority~~. The "R" Certificate Holder responsible for the repair or the construction portion of the modification/alteration shall apply the stamping. For a re-rating where no physical changes are made to the pressure-retaining item, the "R" Certificate Holder responsible for the design shall apply the stamping. Requirements for stamping and nameplate information are shown in NBIC Part 3, Section 5.

S6.185.1 SPECIFIC "R" STAMPING AND NAMEPLATE REQUIREMENTS

The holder of a "R" *Certificate of Authorization* is required to affix a stamping or nameplate on the Transport Tank that indicates, the repair, alteration, or modification has been performed in accordance with the requirements of NBIC Part 3, Supplement 6 and the additional requirements of the code of construction. All repairs, alterations, and modifications, after acceptance by the ~~Registered~~ Inspector, shall have the "R" Symbol affixed to the stamping or the nameplate. The stamping or nameplate information shall satisfy the requirements of ~~a) thru g) below~~NBIC Part 3, 5.7.~~:~~

~~a) The required data shall be in characters at least 4 mm (5/32 in.) high;~~

~~b) The markings may be produced by casting, etching, embossing, debossing, stamping, or engraving;~~

~~c) The selected method shall not result in any harmful contamination or sharp discontinuities to the pressure-retaining boundary of the Transport Tank;~~

~~d) Stamping directly on the Transport Tank, 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 and the embossed Code Symbol stamping may appear on a nameplate affixed to the Transport Tank;~~

~~e) The "R" Certificate Holder shall use its full name as shown on the *Certificate of Authorization* or use an approved abbreviation acceptable to the National Board;~~

~~f) The non-embossed Code Symbol stamping, when directly applied on the item or when a nameplate is used shall be applied adjacent to the original manufacturer's stamping or nameplate. A single repair stamping or nameplate may be used for additional activities performed, provided the repair activity is carried out by the same "R" Certificate Holder;~~

~~g) The date of each repair, alteration, or modification corresponding with the date on the applicable "R" form shall be applied to the exiting stamping or nameplate.~~

S6.185.2 REMOVAL OF ORIGINAL STAMPING OR NAMEPLATE

Removal of the original stamping or nameplate shall comply with the requirements of NBIC Part 3, 5.11. ~~If it becomes necessary to remove the original stamping, the Inspector shall, subject to the approval of the Competent Authority, witness the making of a facsimile of the stamping, the obliteration of the old stamping, and the transfer of the stamping. When the stamping is on a nameplate, the Inspector shall witness the transfer of the nameplate to the new location. Any relocation shall be described on the applicable NBIC "R" Form. The restamping or replacement of a code symbol stamp shall be performed only as permitted by the governing code of construction.~~

S6.18.3 REPLACEMENT OF STAMPING OR NAMEPLATE

Replacement of indistinct stamping or lost, illegible, or detached nameplates shall comply with the requirements provided in NBIC Part 2, 5.2.

S6.196 FORM "R" REPORTS~~"R" FORMS~~

S6.196.1 DOCUMENTATION OF FORM "R" REPORTS

Repairs, alterations, or modifications that have been performed in accordance with the NBIC shall be documented on Form R-1, *Report of Repair* or Form R-2, *Report of Alteration* as shown in NBIC Part 3, Section 5. Form R-4, *Report Supplementary Sheet*, shall be used to record additional data when space is insufficient on Form R-1 or R-2.

S6.196.2 PREPARATION OF FORM "R" ~~FORMS~~REPORTS

Preparation of "R" Forms shall be the responsibility of the "R" Certificate Holder performing the repairs, alterations, or modifications and shall comply with the requirements provided in NBIC Part 3, 5.2.1, 5.2.2 and 5.2.4. ~~An Inspector shall indicate acceptance by signing the appropriate "R" form.~~

S6.1916.3 DISTRIBUTION OF FORM "R" REPORTS

Distribution of Form "R" Reports shall comply with the requirements provided in NBIC Part 3, 5.3 and 5.4

~~a) Legible copies of the completed "R" forms together with attachments shall be distributed to the owner or user, the Inspector, the Competent Authority as required, the Authorized Inspection Agency responsible for the inspection, and the National Board forregistration.~~

~~b) Distribution of the "R" forms and attachments shall be the responsibility of the "R" Certificate Holder per- forming the work.~~

S6.1916.4 REGISTRATION OF FORM ~~R-1 AND FORM R-2~~"R" REPORTS

a) ~~Organizations~~ Repair organizations performing repairs, alterations, or modifications required by this supplement shall ~~register such repairs, alterations, or modifications with the National Board.~~ submit the completed "R" Form, meeting the requirements of the NBIC, to the National Board.

b) The repair organization shall maintain a sequential Form ~~"R"~~Registration Log ~~Log that shall identify the following:~~ as described in Part 3, 5.6.

~~1) Form number assigned for Form R-1;~~

~~2) Identify if the activity was a repair, alteration, or modification;~~

~~3) When the repair, alteration, or modification was completed, and~~

~~4) Date sent to the National Board.~~

~~S6.17 ADDITIONAL REQUIREMENTS FOR REPAIRS, ALTERATIONS, OR MODIFICATIONS~~

~~S6.17.1 SCOPE~~

~~This section provides additional requirements for repairs, alterations, or modifications to DOT Transport Tank pressure-retaining items and shall be used in conjunction with NBIC Part 3.~~

~~S6.17.2 REPAIRS OF DEFECTS~~

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

~~S6.17.3 MODIFICATIONS~~

~~All modifications to the pressure-retaining item shall meet the requirements of NBIC Part 3 for alterations.~~

~~S6.17.4 DRAWINGS~~

~~Drawings or instructions shall be prepared to describe the repair, alterations, or modification. Drawings shallinclude sufficient information to satisfactorily perform the activity.~~

~~S6.17.5 AUTHORIZATION~~

~~Repairs, alterations, or modifications to a pressure-retaining item shall not be initiated without the authorization of the Inspector, who shall determine that the methods are acceptable.~~

~~S6.18 EXAMINATION AND TEST~~

~~The following requirements shall apply to all repairs, alterations, or modifications to DOT Transport Tank pressure-retaining items:~~

~~a) The integrity of repairs and replacement parts used in repairs, alterations, or modifications shall be verified by examination and test;~~

~~b) The "R" Certificate Holder is responsible for all activities relating to examination and test of repair, alterations, or modifications;~~

~~c) Examination and tests to be used shall be subject to acceptance of the Inspector and the Competent Authority when required.~~

~~S6.18.1 METHODS~~

One, or a combination of the following examination methods, shall be applied to DOT Transport Tank pressure-retaining items with the concurrence of the Inspector and the Competent Authority when required.

a) Liquid Pressure Test

Pressure testing of repairs shall meet the following requirements:

1) Pressure tests shall be conducted using water or other suitable liquid. The test pressure shall be the minimum required to verify the leak tightness integrity of the repair, but not more than 150% of the maximum allowable working pressure (MAWP) stamped on the pressure-retaining item, as adjusted for temperature. When original test pressure included consideration of corrosion allowance, the test pressure may be further adjusted based on the remaining corrosion allowance;

2) During a pressure test where the test pressure will exceed 90% of the set pressure of the pressure relief device, the device shall be removed whenever possible. If not possible, a test gag should be used using the valve manufacturer's instructions and recommendations; and

3) Hold time for the pressure test shall be a minimum of 10 minutes prior to examination by the Inspector. Where the test pressure exceeds the MAWP of the item, the test pressure shall be reduced to the MAWP for close examination by the Inspector. Hold time for close examination shall be as necessary for the Inspector to conduct the examination.

b) Pneumatic Test

A pneumatic test may be conducted. Concurrence of the owner shall be obtained in addition to that of the Inspector and the Competent Authority where required. The test pressure shall be the minimum required to verify leak tightness integrity of the repair, but shall not exceed the maximum pneumatic test pressure of the original code of construction. Precautionary requirements of the original code of construction shall be followed.

c) Nondestructive Examination

Nondestructive examination (NDE) may be conducted. NDE methods shall be suitable for providing meaningful results to verify the integrity of the repair.

S6.19 REPAIRS, ALTERATIONS, OR MODIFICATION REPORTS

a) When repairs, alterations, or modifications are performed on a transport tank, i.e., cargo tank, portable tank, or ton tank, the owner or User shall have the activity performed by a Repair Organization that has a valid "R" *Certificate of Authorization* issued by the National Board. "R" forms shall be completed and certified by the "R" Certificate Holder and received and certified by the Inspector.

b) For the purposes of documentation and stamping, modification shall be considered an alteration.

Item No.: 21-02

Subject Title: Define “Fuel Loading” as it pertains to NR activities.

NBIC Location:
Part 3 Repairs and Alterations: 1.6.2 a)

Project Manager and Task Group:
Raymond Spuhl, NR TG

Source Name and Email:
Terrence Hellman, thellman@nationalboard.org

Statement of Need:
The NR TG would like to clarify "Fuel Loading" as used to determine Category 1, 2 or 3 NR activities.

Background Information:

Existing Text:
1.6.2 a)
1) Category 1
Any ASME Section III Code certified item or system requiring repair/replacement activities irrespective of physical location and installation status prior to fuel loading.
2) Category 2
After fuel loading, any item or system under the scope of ASME Section XI requiring repair/ replacement activities irrespective of physical location. Based on regulatory or jurisdictional acceptance, Category 2 may be used prior to fuel loading.
3) Category 3
Items other than those covered by Category 1 or Category 2, requiring repair/replacement activities irrespective of physical location, installation status and fuel loading.

Proposed Text:
1.6.2 a)
1) Category 1
Any ASME Section III Code certified item or system requiring repair/replacement activities irrespective of physical location and installation status ~~prior to fuel loading~~ not under the scope of ASME Section XI.

2) Category 2
~~After fuel loading, a~~Any item or system ~~under the scope of ASME Section XI~~ requiring repair/ replacement activities irrespective of physical location under the scope of ASME Section XI~~.~~ b~~B~~ased on regulatory or jurisdictional requirements
~~acceptance, Category 2 may be used prior to fuel loading~~.

3) Category 3
Any i~~t~~tem or system, other than those covered by Category 1 or Category 2, requiring repair/replacement activities irrespective of physical location, installation status and fuel loading.

PROPOSED REVISION OR ADDITION

Item No.

A 21-12

Subject/Title

Revision to modify Term 'Alteration' and to add Guidance on classifying a Repair vs Alteration

NBIC Location

Part: Repairs and Alterations; Section: Section 3

Project Manager and Task Group

P. Becker (PM), K. Moore, B. Underwood, P. Shanks, S. Chestnut, T. Seime

Source (Name/Email)

Pat Becker, pabecker@babcock.com

Statement of Need

Interpretations continue to be received based on confusion in current guidance given in Section 3, Part 3 of Repairs and Alterations. Of particular issue is the heavily relied upon 'List of Examples' of Repairs and Alterations. The lists are considered a 'shortcut' to understanding which activities should be classified as repairs and which should be alterations. However, the examples are not intended to be used without the understanding of the rest of the subject matter in Part 3, Section 3…nor are they all-inclusive or exclusive.

Experience levels can vary widely among all 'stakeholder' categories, i.e. Owner/User, Authorized Inspector, Certificate Holder, In-Service inspector, Jurisdictional Authority etc.

From the Forward: *The general philosophy underlying the NBIC is to parallel those provisions of the original code of construction, as they can be applied to post-construction activities. The NBIC does not contain rules to cover all details of post-construction activities. Where complete details are not given, it is intended that individuals or organizations, subject to the acceptance of the Inspector and Jurisdiction when applicable, provide details for post-construction activities that will be as safe as otherwise provided by the rules in the original code of construction.*

The Intent of any effort is to improve the user experience while being cognizant not to overly restrict. The task group is paying attention to industry concerns and suggestions including the potential impact of any changes to existing equipment and installations. Existing Interpretations are being 'walked thru' the decision tree and otherwise reviewed against the addition of any content. The goal is to provide clearer guidance with less conflicting or overlapping examples or information.

Background Information

Update of Part 3 Section 3 to improve User experience and clarify definition of 'Alteration'. Updated 'problematic' example lists to eliminate 'conflicting examples'.

Existing Text

PART 3, SECTION 3
REPAIRS AND ALTERATIONS — REQUIREMENTS FOR REPAIRS AND ALTERATIONS

3.1 SCOPE

This section provides requirements and guidelines for materials, replacement parts, and methods used when performing repairs and alterations to pressure-retaining items. Specific repair or alteration methods for other types of pressure equipment are in NBIC Part 3, Section 6.

3.2 GENERAL REQUIREMENTS FOR REPAIRS AND ALTERATIONS

(21) 3.2.1 MATERIAL REQUIREMENTS FOR REPAIRS AND ALTERATIONS

Proposed Text

PART 3, SECTION 3
REPAIRS AND ALTERATIONS — REQUIREMENTS FOR REPAIRS AND ALTERATIONS

3.0 INTRODUCTION

This Section provides information on the requirements for repairs and alterations to pressure retaining items. Information on how to classify, perform, verify, and document acceptable repair and alteration activities may be found throughout Part 3 Sections and Supplements (Refer to the Table of Contents for detail on the location of relevant information). It is the intent that this Section be used in cooperation with local jurisdictional authorities and with an understanding of the applicable pressure vessel code regulations relevant to the scope of repair or alteration activity. Note that the guidance herein and the examples given are not all inclusive and are intended to be representative of cases and activities commonly considered either a repair or alteration.

3.1 SCOPE

This section provides requirements and guidelines for materials and methods used when performing repairs and alterations to pressure-retaining items. Specific repair or alteration methods for other types of pressure equipment are in NBIC Part 3, Section 6.

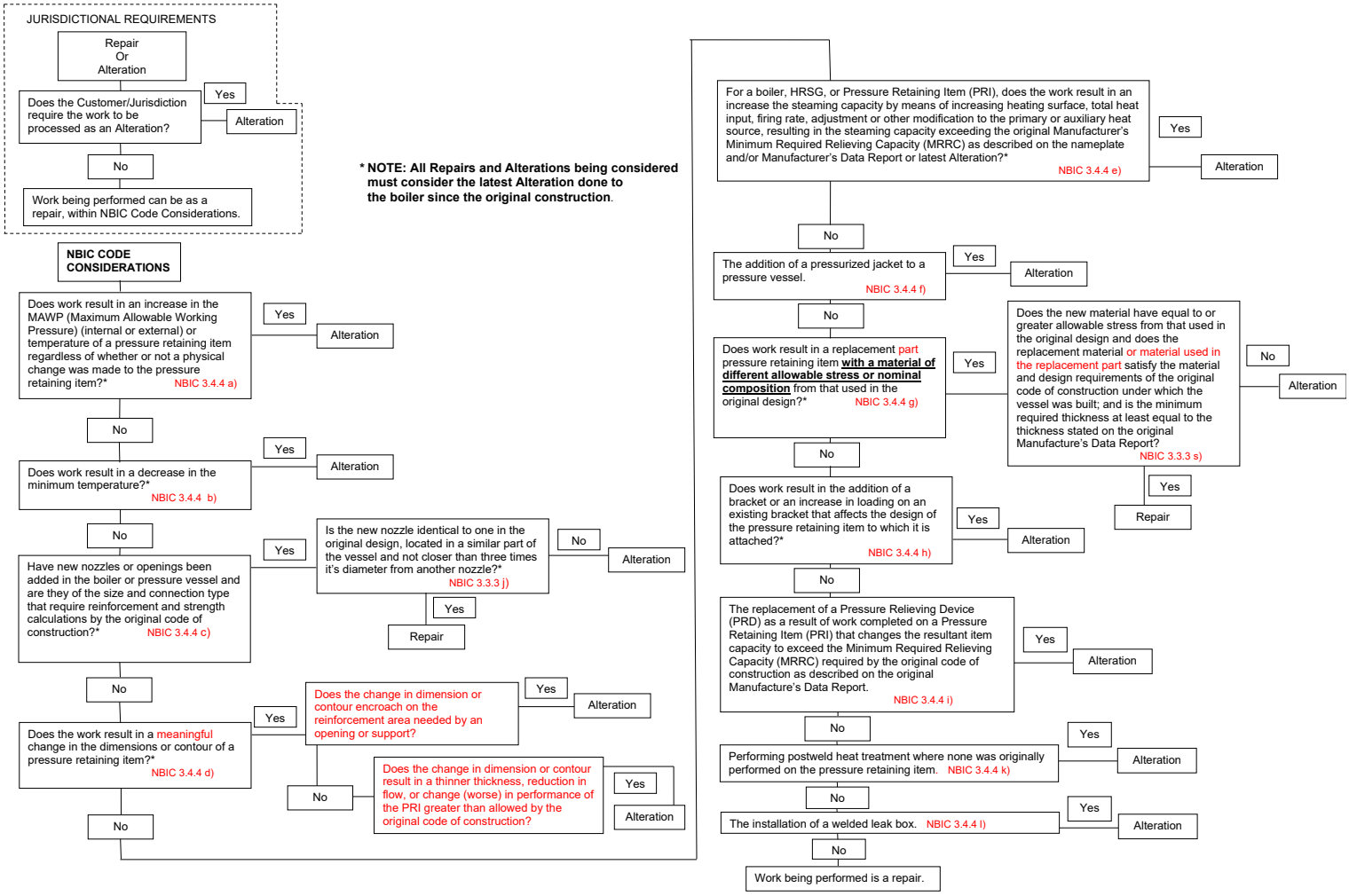
	3.1.1 CLASSIFICATION OF REPAIRS, ALTERATIONS AND REPLACEMENT PARTS When repairing, replacing, or altering existing pressure-retaining items, the activity classification (e.g. Repair vs. Alteration) shall be based on the scope of activity to be performed considering input from the Owner/User, Certificate Holder, AIA, and Jurisdictional Authority. When the scope of activity is complex or there is disagreement related to the classification, the Jurisdictional Authority in the location of the final installation of the repaired, altered or replaced equipment shall be considered the authority. Guidance on determining the activity classification may be found in: SUPPLEMENT X, *CLASSIFYING REPAIRS AND ALTERATIONS* and throughout this section. SUPPLEMENT X, FIGURE SX.1, *DECISION TREE (LOGIC DIAGRAM) FOR DETERMINING REPAIR OR ALTERATION ACTIVITY CLASSIFICATION* is based on the rules and guidance shown throughout Part 3, Section 3 and is provided to aid in determining the activity classification. References to relevant paragraphs may be found following the 'logic' questions throughout the diagram. Replacement Parts may be considered either a repair or alteration. Examples of replacement parts may be found in 3.2.2. Routine Repairs are limited to those listed in 3.3.2, e), 1) thru 5). Repair and Alteration activity examples may be found in 3.3.3 and 3.3.4. **The scope of the work to be performed will determine the classification type. Note that in all cases, the examples of Replacement parts, Routine Repairs, Repairs and Alterations are not all inclusive and should be used along with education, experience, and sound engineering judgment when determining classification type.** **3.2 GENERAL REQUIREMENTS FOR REPAIRS AND ALTERATIONS**
9.1 DEFINITIONS **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.	**9.1 DEFINITIONS** **Alteration —** A change in the item described on the original Manufacturer's Data Report which decreases 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, resulting in change of allowable stress of the material, or a reduction in minimum temperature of a pressure-retaining item shall be considered an alteration. **SUPPLEMENT X** **CLASSIFYING REPAIRS AND ALTERATIONS** **SX.1 SCOPE** **FIGURE SX.1** **DECISION TREE (LOGIC DIAGRAM) FOR DETERMINING REPAIR OR ALTERATION ACTIVITY CLASSIFICATION** **(See Below and Attachment)**

	VOTE:						
COMMITTEE	Approved	Disapproved	Abstained	Not Voting	Passed	Failed	Date

SUPPLEMENT X
CLASSIFYING REPAIRS AND ALTERATIONS

SX.1 SCOPE

FIGURE SX.1
DECISION TREE (LOGIC DIAGRAM) FOR DETERMINING REPAIR OR ALTERATION ACTIVITY CLASSIFICATION



PROPOSED REVISION OR ADDITION

Item No.

21-37

Subject/Title

Parts used in NR activities

NBIC Location

Part: Repairs and Alterations & Repairs and Alterations; Section: 5; Paragraphs: 5.2.5 & 5.2.6

Project Manager and Task Group

Robert Wielgoszinski

Source (Name/Email)

TG NR Committee generated

Statement of Need

Action Item 21-37 is proposing revisions/additions to Part 5 regarding completion of the Forms NR-1 and NVR-1. Particularly including provision to assure that parts or items meeting ASME Code and reported on appropriate ASME Forms are certified by an Inspector holding the proper endorsements. That is the N, I, and/or C endorsements.as appropriate.

Background Information

Current text in the NBIC does not specify any special rules for parts or other items to be used in NR work. This change will assure that any work performed on parts or other items to be used in NR activities is inspected and certified by an appropriate ANI, ANII, or ANI-C

Existing Text

Proposed Text

See attached proposal

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

PROPOSED REVISION OR ADDITION

Item No.

A 21-43

THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

Subject/Title

Defining and revising "Practicable" and "Practical" within the NBIC

NBIC Location

Part: Repairs and Alterations; Section: 9; Paragraph: Glossary - All Parts

Project Manager and Task Group

Marty Toth, Subcommittee Repairs/Alterations

Source (Name/Email)

Marty Toth / mtoth@boiscotraininggroup.com

Statement of Need

Defining and revising Practicable and Practical within the NBIC and revising where applicable

Background Information

Defining and revising Practicable and Practical within the NBIC and revising where applicable

Existing Text	Proposed Text
	Practicable: An NBIC activity such as, but not limited to, a process, action, test, or examination that is able to be done or performed. **Practical**: An NBIC activity such as, but not limited to, a process, action, test, or examination that is able to provide useful and suitable results.

PROPOSED REVISION OR ADDITION

Item No.

A 21-44

Subject/Title

Defining "De-Rating" within Part 3

NBIC Location

Part: Repairs and Alterations; Section: Section 3; Paragraph: 3.4.1

Project Manager and Task Group

Marty Toth, Subcommittee Repairs/Alterations

Source (Name/Email)

Marty Toth / mtoth@boiscotraininggroup.com

Statement of Need

Defining de-rating within Part 3

Background Information

Defining de-rating within Part 3

Existing Text	Proposed Text
	Derate (Boiler): The decrease of a high-pressure steam boiler's MAWP at or below 15 psi where consideration and the replacement of safety valves, steam outlet piping size, and controls and safety devices needs to be made, subject to the requirements of the Jurisdiction where the boiler is installed.

	VOTE:						
COMMITTEE	Approved	Disapproved	Abstained	Not Voting	Passed	Failed	Date

(MDSC), or BTU/hr (W) heating capacity, the new MRRC shall be documented on Form R-2 and indicated on the appropriate nameplate of NBIC Part 3, Figure 5.7.5-b or NBIC Part 3, Figure 5.7.5-c.

a) Final preparation of Form R-2, including gathering and attaching supporting reports, shall be the responsibility of the "R" Certificate Holder that performed the construction portion of the alteration. The construction organization shall complete the Form R-2 provided by the design organization, including the "Construction Certification" section of the form. An Inspector shall indicate that the work complies with the applicable requirements of this code by completing and signing the "Certificate of Inspection" section of the form. When no construction work is performed (e.g., a re-rating with no physical changes), the "R" Certificate Holder responsible for the design shall prepare the Form R-2, including gathering and attaching of supporting documentation.

b) The following shall be attached to and become a part of completed Form R-2:

1) For ASME boilers and pressure vessels, a copy of the original Manufacturer's Data Report, when available;

2) Form R-3, Report of Parts Fabricated by Welding, Manufacturer's Partial Data Reports, or Certificates of Compliance, if applicable; and

3) For other than ASME, the manufacturer's reports (i.e., reports required by the original code of construction, etc.), when available.

(21) **5.1.1 PREPARATION OF FORM R-3 REPORT OF PARTS FABRICATED BY WELDING**

Using the instructions found in Table S9.4 of Supplement 9, preparation of Form R-3 shall be the responsibility of the "R" Certificate Holder responsible for performing the work.

(21) **5.1.2 PREPARATION OF FORM R-4 REPORT SUPPLEMENT SHEET**

Using the instructions found in Table S9.5 of Supplement 9, preparation of Form R-4 shall be the responsibility of the "R" Certificate Holder responsible for performing the work.

(21) **5.1.3 PREPARATION OF FORM NR-1, REPORT OF REPAIR/REPLACEMENT ACTIVITIES FOR NUCLEAR FACILITIES**

~~Using the instructions found in Table S9.6 of Supplement 9, preparation of Form NR-1 shall be the responsibility of the "NR" Certificate Holder responsible for performing the work.~~

(21)

a) Using the instructions found in Table S9.6 of Supplement 9, preparation of Form NR-1 shall be the responsibility of the "NR" Certificate Holder performing the repair.

b) Information describing the scope of work used to repair a pressure-retaining item (PRI) shall be documented on a Form NR-1 and extended to a Form R-4 as needed to fully describe the repair activities completed per the instructions in Table S9.6 of Supplement 9.

c) An Inspector holding appropriate endorsements shall indicate acceptance by signing Form NR-1, and Form R-4, if attached.

d) The Form R-3, *Report of Parts Fabricated by Welding,* Manufacturer's Data Reports, and Certificates of Compliance described in this section shall be a part of the completed Form NR-1 and shall be attached thereto. Parts or items fabricated by welding to ASME shall be reported on the appropriate ASME Data Report Form, certified by an Authorized Nuclear Inspector holding the appropriate endorsements and attached to the Form NR-1.

PREPARATION OF FORM NVR-1

5.2.6 PREPARATION OF REPORT OF REPAIR/REPLACEMENT ACTIVITIES FOR NUCLEAR PRESSURE RELIEF DEVICES

~~Using the instructions found in Table S9.7 of Supplement 9, preparation of Form NVR-1 shall be the responsibility of the "NR" Certificate Holder, possessing the "VR" Certificate denoting the repair of nuclear pressure relief valves, responsible for performing the work.~~

a) Using the instructions found in Table S9.7 of Supplement 9, preparation of Form NVR-1 shall be theresponsibility of the "NR" Certificate Holder, possessing the "VR" Certificate denoting the repair of nuclear pressure relief valves, responsible for performing the repair.

b) Information describing the scope of work used to repair a pressure-retaining item (PRI) shall be documented on a Form NVR-1 and extended to a Form R-4 as needed to fully describe the repair activitiescompleted per the instructions in Table S9.7 of Supplement 9.

c) An Inspector holding appropriate endorsements shall indicate acceptance by signing Form NVR-1, and Form R-4, if attached.

d) The Form R-3, *Report of Parts Fabricated by Welding,* Manufacturer's Data Reports, and Certificates of Compliance described in this section shall be a part of the completed Form NVR-1 and shall be attached thereto. Parts or items fabricated by welding to ASME shall be reported on the appropriate ASME Data Report Form, certified by an Authorized Nuclear Inspector holding the appropriate endorsements and attached to the Form NVR-1.

5.2 DISTRIBUTION OF FORM R-1

a) Legible copies of completed Form R-1, together with attachments, shall be distributed to the owner or user and Jurisdiction, if required, and shall be provided to the Inspector and the inservice Authorized Inspection Agency of the pressure retaining item upon request.

b) Distribution of Form R-1 and attachments shall be the responsibility of the organization performing the repair.

SUPPLEMENT XX - REPAIR METHODS OF PRESSURE VESSELS AND PIPING EXCLUSIVE TO OIL, GAS, AND CHEMICAL INDUSTRIES

SXX.1 SCOPE

This supplement provides methods for repair of pressure retaining items, outside the boiler setting through the administrative boundary of ASME Section I and IV, exclusive to oil, gas, and chemical manufacturing.

SXX.2 CONSTRUCTION STANDARDS

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

SXX.3 LIMITATIONS

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

a) Operates at or below 650°F (345°C) for carbon steels or below the time dependent service temperatures for low alloy steel.

b) Impact testing was not required.

c) Not used in lethal service.

d) No environmental or service-related cracking conditions exist, except as provided by NBIC Part 3, 3.3.4.8.

SXX.4 JURISDICTIONAL REQUIREMENTS

Repairs will require notification to the Jurisdiction and where required, Jurisdictional approval prior to performing work.

SXX.5 REPAIR METHODS

a) WELDED LAP PATCH

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

1) Welded lap patches shall be further restricted as follows:

a. A lap patch installed over an existing lap patch is prohibited.

b. The distance between lap patches shall not be less than $2\sqrt{(Rt)}$ where R is the outside radius of the spherical or cylindrical shell in inches (mm), and t is equal to the nominal wall thickness of the spherical or cylindrical shell in inches (mm).

2) Except as required in Part 3, Paragraph SXX.5 a)4)a), ASME PCC-2 shall be used for the design of the welded lap patch and shall be in accordance with the original code of construction, when practicable. Design of a welded lap patch shall consider original design conditions, taking in to account current service conditions and damage mechanisms. Use of this method shall be acceptable to the Inspector and where required, the Jurisdiction and shall be limited to pressure containing equipment owned and operated by an owner or user.

a. Lap patch material should be the same (e.g., composition, physical and mechanical properties) to that of the pressure retaining items' original construction. Lap patch material of a different nominal composition and, equal to or greater in allowable stress from that used in the original design, may be

used provided the material satisfies the requirements of the original code of construction under which the vessel was built.

3) The "R" Certificate Holder responsible for the design of the welded lap patch shall ensure a Fitness for Service Assessment (FFSA) has been performed on the area of the item being patched in accordance with NBIC, Part 2, 4.4.1, supporting the continued service of the item. The welded lap patch repair method shall not remain in place beyond the calculated remaining life of the covered portion of the pressure retaining item.
   a) The remaining life of the pressure retaining item shall be documented on the Form NB-403 in the Remarks section. The Form NB-403 shall be affixed to the Form R-1 and identified in the Remarks section. 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 NB-403.
   b) The thinned or leaking area shall be fully covered, as specified in the FFSA, to the distance where the minimum required metal thickness is verified. Wall thickness shall be verified in the area to be welded.
   c) A welded lap patch method shall not be used where cracks are present unless the cracks have been removed and repaired in accordance with NBIC Part 3, 3.3.4.2 a) and the condition that led to the crack formation and propagation has been eliminated.
4) Hazards associated with welding on degraded components should be addressed with the owner or user by the use of engineering controls, administrative controls and personal protective equipment.
   a) When the pressure retaining item will remain in service while implementing a welded lap patch, the requirements and limitations described within ASME PCC-2, Part-1 shall be used in conjunction with ASME PCC-2, Part-2.
   b) API RP-2201, "Safe Hot Tapping Practices in the Petroleum and Petrochemical Industries" may be used as a guideline for identifying hazards associated with welding to a component that is under pressure, including service restrictions.
5) Test or examination methods shall be in accordance with NBIC, Part 3, 4.4.1.

SXX.6 Post Repair Inspection

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

SXX.7 Documentation

a) Documentation and distribution requirements for repair methods identified in this supplement are identified in NBIC Part 3, Section 5.

SXX.8 Registration

a) Organizations performing repairs under an "R" stamp program shall register such repairs with the National Board.

THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

PROPOSED REVISION OR ADDITION

Item No. A21-53	
Subject/Title Supplement 8 Weld and Post Repair Inspection of Creep Strength Enhanced Ferritic Steel Pressure Equipment	
NBIC Location NBIC Part 3 Repairs and Alterations Supplement 8 S8.5 a)	
Project Manager and Task Group Philip Gilston	
Source (Name/email) Mark Kincs / mark.r.kincs@xcelenergy.com	
Statement of Need The requirement for Inspector involvement in post-repair inspections to CSEF weld repairs is to ensure future safe operation of the boiler. This is a function of the in service Authorized Inspection Agency, not the Repair Inspector, whose duties end with completion of repair documentation.	
Background Information The post-repair inspection requirements specified in S8.5 are unique. There is no other mention of such inspections elsewhere in NBIC–Part 3. Presumably, Welding Method 6 repairs don't require post-repair inspection due to the perceived low-level of associated risk (inside the boiler setting).	
S8.5 POST REPAIR INSPECTION a) After the completion of weld repairs to CSEF steels, post inspection requirements shall be developed and implemented based on acceptance from the Inspector, and if applicable, the Jurisdiction. b) Post-repair inspection intervals and methods of examination shall be implemented to ensure safe operation and margin to locate and monitor defect growth in the weld repair area. The selected non-destructive examination method shall provide meaningful results and shall follow NBIC Part 3, Section 4. c) Post repair inspection shall be on-going until the component reaches end of life or is replaced. The Owner/User may revise the re-inspection interval based on inspection results from previous inspections.	**S8.5 POST REPAIR INSPECTION** a) After the completion of weld repairs to CSEF steels, post inspection requirements shall be developed and implemented based on acceptance from the ~~Inspector~~inservice Authorized Inspection Agency of the pressure retaining item, and if applicable, the Jurisdiction. b) Post-repair inspection intervals and methods of examination shall be implemented to ensure safe operation and margin to locate and monitor defect growth in the weld repair area. The selected non-destructive examination method shall provide meaningful results and shall follow NBIC Part 3, Section 4. c) Post repair inspection shall be on-going until the component reaches end of life or is replaced. The Owner/User may revise the re-inspection interval based on inspection results from previous inspections.

	VOTE						
Committee	Approved	Disapproved	Abstained	Not Voting	Passed	Failed	Date

Item 22-12: Lost or Destroyed UDS (Part 3, 3.3.5.2 & 3.4.5.1)

Explanation of Need: To provide the ability to repair/alter these vessels with a reconstructed UDS.

Background Information: This addition is based on the comments received at the task group level for Interpretation 21-60.

Proposed Changes:

3.3.5.2 REPAIR PLAN

The user shall prepare, or cause to have prepared, a detailed plan covering the scope of the repair.

a) Engineer Review and Certification

The repair plan shall be reviewed and certified by an engineer meeting the criteria of ASME Section VIII, Division 2 or 3, as applicable, for an engineer signing and certifying a Manufacturer's Design Report. The review and certification shall be such as to ensure the work involved in the repair is compatible with the User's Design Specification and the Manufacturer's Design Report. The certifying requirement may be waived for ASME Section VIII, Division 2, Class 1 vessels that did not require the Manufacturer's Design Report to be certified during initial construction.

If the User's Design Specification (UDS) is lost or destroyed, the ASME nameplate~~,~~ and the applicable ASME Section VIII, Division 2 and 3 ~~forms~~Manufacturer's Data Reports, ~~and~~ Partial Data Reports, and/or the Manufacturer's Design Report shall be used to reconstruct the User's Design Specification ~~such as Form A-1 Manufacture's Data Report, Form A-2 Manufacturer's Partial Data Report for Section VIII, Division 2 vessels or Manufacturer's Data Reports for Section VIII, Division 3~~. The reconstructed UDS shall meet the requirements and be certified in accordance with the latest edition of ~~of~~ ASME Section VIII, Division 2 or Division 3.

~~**Note:** The engineer qualification criteria of the Jurisdiction where the pressure vessel is installed should be verified before selecting the certifying engineer.~~

b) Authorized Inspection Agency Acceptance

Following review and certification, the repair plan shall be submitted for acceptance to the Authorized Inspection Agency/Owner-User Inspection Organization whose Inspector will make the acceptance inspection and sign the Form R-1.

3.4.5.1 ALTERATION PLAN

a) Engineer Review and Certification

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

Provided that the alteration does not introduce a condition that would require an engineer to sign the Manufacturer's Design Report for ASME Section VIII, Division 2, Class 1 vessels, the certifying requirement may be waived for vessels that did not require the Manufacturer's Design Report to be certified during initial construction.

If the User's Design Specification (UDS) is lost or destroyed, the ASME nameplate~~,~~ and the applicable ASME Section VIII, Division 2 and 3 ~~forms~~Manufacturer's Data and Partial Data Reports shall be used to reconstruct the User's Design Specification~~ such as Form A-1 Manufacture's Data Report, Form A-2 Manufacturer's Partial Data Report for Section VIII, Division 2 vessels or Manufacturer's Data Reports for Section VIII, Division 3~~. The reconstructed UDS shall meet the requirements of ASME Section VIII, Division 2 or Division 3.

Note: The engineer qualification criteria of the jurisdiction where the pressure vessel is installed should be verified before selecting the certifying engineer.

PROPOSED REVISION OR ADDITION

Item No.

A 22-18

Subject/Title

Definition of blowdown and blowoff

NBIC Location

Part: Installation & Pressure Relief Devices; Section: Section 9 & 9; Paragraph: 1 & 1

Project Manager and Task Group

Kathy Moore, Subcommittee Repairs/Alterations

Source (Name/Email)

Kathy Moore / kathymoore@joemoorecompany.com

Statement of Need

These terms are not consistently used throughout the industry. This is to provide guidance to use the correct term when addressing the equipment or the action.

Background Information

Gary Scribner is updating NB-27 which addresses this action and equipment. We want to have consistent terminology used for all NB documents. I will be glad to be the PM and present it to each group.

Existing Text	Proposed Text
	Blowoff - the equipment and piping used when blowing down equipment such as boiler Blowdown - The act of releasing liquid, steam, or air with the purpose of removing solids or impurities from equipment

	VOTE:						
COMMITTEE	Approved	Disapproved	Abstained	Not Voting	Passed	Failed	Date

PROPOSED REVISION OR ADDITION

Item No.

A 22-27

Subject/Title

Post Repair Activity - Boil Out

NBIC Location

Part: Repairs and Alterations; Section: ?; Paragraph: ?

Project Manager and Task Group

Source (Name/Email)

Don Patten / dpatten@baycityboiler.com

Statement of Need

When major repairs are made and the boiler is not properly cleaned of oils, it will cause water level instability and carryover.

Background Information

Part 1 - Installations is adding boil out for new installations.

Existing Text

Proposed Text

Boilers that have had repairs with new materials, tube replacement, re-rolling or other extensive repairs to the pressure parts should be boiled out. Non water-soluble metal lubricants used for rolling tubes, plus the protective coating on the new tubes or parts that are on the water side, should be removed by boiling out before the repaired boiler is put back into service.

	VOTE:						
COMMITTEE	Approved	Disapproved	Abstained	Not Voting	Passed	Failed	Date

PROPOSED REVISION OR ADDITION

Item No.

A 22-29

Subject/Title

Removal of the requirement of AIA audits from the NR program

NBIC Location

Part: Repairs and Alterations & Repairs and Alterations; Section: 1.6.6.2 & 1.6.7.2; Paragraph: s) 6) & s) 6)

Project Manager and Task Group

Source (Name/Email)

Benjamin Schaefer / bschaefer@aep.com

Statement of Need

This requirement cannot be enforced and is not defined by the the NR Certificate Holder and therefore must be removed.

Background Information

The sentence is located in Category 1, 2, and 3 of the NR Program and needs to be removed from all locations.

Existing Text	Proposed Text
6) Audit records shall include as a minimum: a. written procedures; b. checklists; c. reports; d. written replies; and e. completion of corrective actions. Performance of Authorized Inspection Agency audits required by ASME QAI-1 and NB-263, RCI-1 shall be addressed in the Quality Assurance Manual.	6) Audit records shall include as a minimum: a. written procedures; b. checklists; c. reports; d. written replies; and e. completion of corrective actions.

	VOTE:						
COMMITTEE	Approved	Disapproved	Abstained	Not Voting	Passed	Failed	Date

PROPOSED REVISION OR ADDITION

Item No.

A 22-41

Subject/Title

Reference NB-415 in Quality System

NBIC Location

Part: Repairs and Alterations; Section: 1; Paragraph: 1.5

Project Manager and Task Group

Source (Name/Email)

Terrence Hellman / thellman@nationalboard.org

Statement of Need

Requirements in the NB-415 should be included in the R Cert. Holder's QC Manual. Examples : a) Notifying the National Board when an organization changes scope, ownership, name, location, address, or Inspection Agreement and b) Return of the stamp.

Background Information

Requirements in the NB-415 should be included in the R Cert. Holder's QC Manual. Examples : a) Notifying the National Board when an organization changes scope, ownership, name, location, address, or Inspection Agreement and b) Return of the stamp.

Existing Text

Proposed Text

A holder of a National Board Certificate of Authorization shall have and maintain a written Quality System. The System shall satisfactorily meet the requirements of the NBIC and the NB-415, and shall be available for review. The Quality System may be brief or voluminous, depending on the projected scope of work. It shall be treated confidentially by the National Board.

	VOTE:						
COMMITTEE	Approved	Disapproved	Abstained	Not Voting	Passed	Failed	Date

b) Organizations performing repairs outside the scope of the NBIC may be accredited and shall meet any additional requirements of the Jurisdiction where the work is performed.

1.4.1 ACCREDITATION PROCESS

a) The National Board administers accreditation programs for authorization of organizations performing repairs and alterations to pressure-retaining items in accordance with NB-415, *Accreditation of "R" Repair Organizations*.

b) Any organization may apply to the National Board to obtain a *Certificate of Authorization* for the requested scope of activities. A review shall be conducted to evaluate the organization's quality system. The individual assigned to conduct the evaluation shall meet the qualification requirements prescribed by the National Board. Upon completion of the evaluation, any deficiencies within the organization's quality system will be documented and a recommendation will be made to the National Board regarding issuance of a *Certificate of Authorization*.

c) As part of the accreditation process, an applicant's quality system is subject to a review. National Board procedures provide for the confidential review resulting in recommendations to issue or not issue a *Certificate of Authorization*.

d) The accreditation programs provide requirements for organizations performing repairs and alterations to pressure-retaining items.

e) The organization may perform repairs or alterations in its plants, shops, or in the field, provided such operations are described in the organization's Quality System.

f) The Jurisdiction, as defined in Part 3, Section 9, may audit the Quality System and activities of an organization upon a valid request from an owner, user, inspection agency, or the National Board.

g) The NBIC Committee may at any time change the rules for the issuance of Certificates of Authorization and use of the "R" Symbol Stamp. These rules shall become binding on all certificate holders.

1.4.2 NATIONAL BOARD "R" SYMBOL STAMP

a) The "R" Symbol Stamp is furnished on loan by the National Board for a nominal fee.

b) Provisions may be made for the issuance of the "R" Symbol Stamp for use at various field locations.

c) Additional requirements shall be met in accordance with NB-415, *Accreditation of "R" Repair Organizations*.

1.5 QUALITY SYSTEM

A holder of a National Board *Certificate of Authorization* shall have and maintain a written Quality System. The System shall satisfactorily meet the requirements of the NBIC and the NB-415, and shall be available for review. The Quality System may be brief or voluminous, depending on the projected scope of work. It shall be treated confidentially by the National Board.

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

The following is a guide for required features of a Quality System which shall be included in the organization's Quality System Manual. As a minimum, each organization shall address the required features relative to the scope of work to be performed. Organizations shall explain their intent, capability and applicability for each required feature outlined in this section. Work may be subcontracted provided controls are clearly

4.1.2 The application for the National Board *Certificate of Authorization* is submitted within 12 months of the issuance of the ASME BPV Code *Certificate of Authorization*. Subsequent National Board *Certificates of Authorization* shall be renewed as described in Paragraphs 2.0 and 3.0 above.

5.0 Jurisdictional Audit

5.1 The Jurisdiction may audit the written Quality System and activities of an organization upon a valid request from an Owner-User, Authorized Inspection Agency, or the National Board.

5.2 The National Board may audit the written Quality System and activities of a Federal Agency upon a valid request from a Federal Agency.

6.0 Use of the "R" *Certificate of Authorization*

6.1 Stamp Use

Each "R" symbol stamp shall be obtained from the National Board and shall be used only by the repair organization within the scope and limitations, under which it was issued. The organization's written Quality System shall provide for constant control of the "R" Symbol Stamp. The organization shall not permit others to use the "R" symbol stamp assigned to them.

6.2 Return of Stamp

Each applicant shall agree that the stamp is the property of the National Board and will be promptly returned upon demand. The "R" Symbol Stamp shall be returned to the National Board if the organization discontinues the use of the "R" Symbol Stamp or if there exists no inspection agreement with an Authorized Inspection Agency or if the *Certificate of Authorization* has expired and a new certificate has not been issued.

6.3 *Certificate of Authorization* Contents

The name and address of the repair organization, the scope of the certificate (repairs, alterations, shop only, field only, shop and field, metallic or non-metallic, and design only), the certificate number, and the issuance date and expiration date shall be specified on the repair organization's *Certificate of Authorization*.

* 6.4 Changes in Scope, Ownership, Name, Location, Address, or Inspection Agreement with an Authorized Inspection Agency

The National Board must be notified when an organization holding a *Certificate of Authorization* changes scope, ownership, name, location, address, or Inspection Agreement with an Authorized Inspection Agency. The National Board will provide appropriate forms to revise the *Certificate of Authorization*. At the option of the National Board, a re-review of the organization's written Quality System and/or its implementation may be required.

6.5 Issuance of Multiple "R" Symbol Stamps

The holder of a *Certificate of Authorization* may obtain more than one "R" symbol stamp provided its written Quality System manual controls the use of such stamps from the address of record shown on the *Certificate of Authorization*.

7.0 Written Quality System

A holder of a *Certificate of Authorization* shall have and maintain a written Quality System. It shall be treated confidentially by the National Board and by the Review Team. An outline of the requirements for a written Quality System can be found in NBIC, Part 3.

8.0 Due Process

The National Board provides procedural due process in connection with accreditation activities. There are several levels to which an aggrieved party may appeal. The process may be initiated by contacting the National Board's Executive Director.

PROPOSED INTERPRETATION

Item No.

22-36

Subject/Title

Use of Code case 2787 in Repairs

Project Manager and Task Group

Source (Name/Email)

Alfred Donaldson / alfred.donaldson@bakerhughes.com

Statement of Need

Code Case 2787 was approved by ASME to allow a manufacturer to develop valves that will work on multimedia applications without any required adjustments. These valves may have different components and will have multiple certified capacities. As these valves are entering the marketplace, some customers are requesting that their existing valves get converted to the multimedia type valves. This request would allow the NBIC Committee to adopt the Code Case for us in the VR program in accordance with NBIC Part 4.2.2 and allow the VR holder to convert a valve to a multimedia design that has more than one certified capacity on the valve nameplate.

Background Information

This is a Part 4 issue but the system only shows Part 1 & 2

Proposed Question

Under the provisions of paragraph 4.2.2, is it permissible to apply Code Case 2787 and convert a pressure relief valve by adding more than one certified capacity on the pressure relief valve or nameplate?

Proposed Reply

Proposed Reply: Yes, provided that the “VR” Certificate Holder verifies that: 1. All of the requirements of ASME Code Case 278 are met, and 2. That all of the requirements of the NBIC concerning conversions, and specifically paragraph 4.7.3 are met.

Committee's Question 1

Committee's Reply 1

Rationale

Committee's Question 2

Committee's Reply 2

Rationale

ACCREDITATION PROGRAMS

The National Board administers four specific accreditation programs as shown below:

"**R**"…..Repairs and Alterations to Pressure-Retaining Items (NB-415)
"**VR**"… .....Repairs to Pressure Relief Valves and Pin Devices (NB-514)
"**NR**"… .....Repair and Replacement Activities for Nuclear Items (NB-417)
"**T/O**"… ....Testing of Pressure Relief Valves (NB-528)

The administrative requirements for the accreditation for these accreditation programs can be viewed on the National Board Website at www.nationalboard.org.

The National Board also administers accredits four specific inspection agency programs as shown below:

New Construction

National Board Acceptance of Authorized Inspection Agencies (AIA) *Accredited by the American Society of Mechanical Engineers* (ASME) (NB-360)

PART 4, SECTION 1
PRESSURE RELIEF DEVICES — GENERAL AND ADMINISTRATIVE REQUIREMENTS

1.1 SCOPE

This Part provides guidelines and requirements for the installation, in-service inspection and testing, and repairs of pressure relief devices.

1.2 CONSTRUCTION STANDARDS FOR PRESSURE RELIEF DEVICES

a) When the standard governing the original construction is the ASME Code, installation and repairs to pressure relief devices shall conform to the ASME Code section and edition most applicable to the work planned.

b) If the pressure relief device was not constructed to the ASME Code, then installation, inspection and repair shall wherever possible reference the original code of construction most applicable to the work.

c) If the pressure relief device was not constructed to any recognized construction code or standard, then installation, inspection, and repair shall reference a construction standard or specification most applicable to the work.

d) Where this is not possible or practicable, it is permissible to use other codes, standards, or specifications, including the ASME Code, provided there is concurrence of the Inspector (if applicable) and the Jurisdiction where the pressure relief device is installed.

1.3 PRESSURE RELIEF DEVICES — DEFINITIONS

Refer to Section 9, *Glossary* for definitions relating to pressure relief devices.

1.3.1 ADDITIONAL DEFINITIONS RELATING TO PRESSURE RELIEF DEVICES

Unless otherwise specified in the NBIC, the definitions relating to pressure relief devices in Section 2 of ASME PTC-25 shall apply.

1.4 ACCREDITATION

a) The National Board administers four specific accreditation

programs:

"**R**" — Repairs and Alterations to Pressure-Retaining Items

"**VR**" — Repairs to Pressure Relief Valves and Pin Devices

"**NR**" — Repair and Replacement Activities for Nuclear Items

"**T/O**" — In-service Testing Only of Pressure Relief Valves

b) Organizations performing repairs and in-service testing to pressure relief valves shall be accredited as described in this section, as appropriate for the scope of work to be performed.

c) Organizations performing repairs and in-service testing to pressure relief valves outside the scope of the NBIC may be accredited and shall meet any additional requirements of the Jurisdiction where the work is performed.

1.4.1 ACCREDITATION PROCESS

a) The National Board administers accreditation programs for authorization of organizations performing repairs and in-service testing to pressure relief valves and pin devices.

b) Any organization may apply to the National Board to obtain a *Certificate of Authorization* for a requested scope of activities. A review shall be conducted to evaluate the organization's Quality System. The individual assigned to conduct the evaluation shall meet the qualification requirements prescribed by the National Board. Upon completion of the evaluation, any deficiencies within the organization's Quality System will be documented and a recommendation will be made to the National Board regarding issuance of a *Certificate of Authorization*.

c) National Board procedures provide for the confidential review resulting in recommendations to issue or not issue a *Certificate of Authorization*.

d) The accreditation program provides requirements for organizations performing repairs and in-service testing to pressure relief valves and pin devices. Depending upon the expected scope of activities at the time of review, organizations may be authorized to perform repairs and in-service testing either in the shop only, field only, or shop and field. Repair and in-service testing activities shall be limited to the scope of work authorized.

e) Organizations desiring to renew or obtain a National Board *Certificate of Authorization* shall apply to the National Board using forms obtained from the National Board. Application for renewal shall be made prior to the expiration date of the *Certificate of Authorization*.

f) When an organization has shops in more than one location, the organization shall submit separate applications for each shop. The organization may perform repairs in its shop or in the field, provided such operations are described in the organization's Quality System.

3.2.3 INSPECTION REQUIREMENTS FOR INSTALLATION CONDITION

a) Ensure all covers, caps, plugs, and/or lift lever wires utilized for shipping or transport are removed.

b) Inlet piping shall be inspected to ensure it meets the requirements of the original code of construction. For pressure relief valves and pin devices certified for capacity, the inlet pipe shall be checked to ensure the inlet pipe size is not smaller than the device inlet size. This requirement is not applicable for flow resistance certified pin devices

c) Discharge piping shall be inspected to ensure it meets the original code of construction. For pressure relief valves and pin devices certified for capacity, the discharge pipe shall be checked to ensure the discharge pipe size is not smaller than the device outlet size. This requirement is not applicable for flow resistance certified pin devices

d) The ~~valve~~ drain piping shall be checked to ensure the piping is open.

e) The discharge piping shall be checked to ensure it drains properly.

f) The inlet and discharge piping shall be checked to ensure they are not binding or placing excessive stress on the pressure relief valve or pin device body, which can lead to distortion of the body and leakage or malfunction.

g) The condition and adequacy of the pipe supports shall be inspected. Discharge piping should be supported independent of the device itself.

h) The ~~valve~~ discharge and discharge pipe shall be checked for possible hazards to personnel.

i) The installation shall be checked to ensure that there are no intervening isolation valves between the pressure source and the ~~valve~~ pressure relief device inlet or between the ~~valve~~ pressure relief device outlet and its point of discharge. Isolation valves may be permitted in some pressure vessel service. (See 2.5.6 e)), and Jurisdictional requirements. Isolation valves shall not be used for power boilers, heating boilers, or water heaters.

j) A change-over valve, which is used to install two pressure relief devices on a single vessel location for the purpose of switching from one device to a spare device, is not considered a block valve if it is arranged such that there is no intermediate position that will isolate both pressure relief devices

8) Rupture disks are often used to isolate pressure relief valves from services where fouling or plugging of the valve inlet occurs. This tendency should be considered in establishing the inspection frequency.

9) Since rupture disks are non-reclosing devices, a visual inspection is the only inspection that can be performed. A rupture disk that is removed from its holder shall not be reinstalled unless recommended by the manufacturer. A rupture disk contained in an assembly that can be removed from a system without releasing the force maintaining the contact between the disk and holder, such as pre-torqued, welded, soldered, and some threaded assemblies, may be suitable for reinstallation after visual inspection. The manufacturer should be consulted for specific recommendations.

10) It is recommended that all rupture disks be periodically replaced to prevent unintended failure while in service due to deterioration of the device. Rupture disks should be carefully checked for damage prior to installation and handled by the disk edges, if possible. Any damage to the surface of the ruptured disk can affect the burst pressure.

3.2.5 TESTING AND OPERATIONAL INSPECTION OF PRESSURE RELIEF DEVICES

a) Pressure relief valves and pin devices 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 deter- mine 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 performed at a test facility, the record of this test should be reviewed to ensure the valve meets the requirements of the original code of construction. Valves 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 shall be disassembled, cleaned, and decontaminated, repaired, and reset.

3) If a valve has been removed for testing, the inlet and outlet connections should be checked for blockage by product buildup or corrosion.

c) 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.

d) 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;

3.2.6 RECOMMENDED INSPECTION AND TEST FREQUENCIES FOR PRESSURERELIEF DEVICES

Frequency of test and inspection of pressure relief devices for pressure vessel and piping service is greatly dependent on the nature of the contents, external environment, and operation of the system, therefore only general recommendations can be given. Inspection frequency should be based on previous inspection history. If, during inspection, ~~valves~~ devices are found to be defective or damaged, intervals should be shortened until acceptable inspection results are obtained. Where test records and/or inspection history are not available, the following inspection and test frequencies are suggested:

3.2.6.1 ESTABLISHMENT OF INSPECTION AND TEST INTERVALS

Where a recommended test frequency is not listed, the ~~valve~~ pressure relief device user and Inspector must determine and agree on a suitable interval for inspection and test. Some items to be considered in making this determination are:

a) Jurisdictional requirements;

b) Records of test data and inspections from similar processes and similar devices in operation at that facility;

c) Recommendations from the device manufacturer. In particular, when the ~~valve~~ pressure relief device includes non-metallic parts such as a diaphragm or soft seat, periodic replacement of those parts may be specified;

d) Operating history of the system. Systems with frequent upsets where a ~~valve~~ pressure relief device pressure has actuated require more frequent inspection;

e) Results of visual inspection of the device and installation conditions. Signs of ~~valve~~ pressure relief device leakage, corrosion or damaged parts all indicate more frequent operational inspections;

f) ~~Installation of a valve in a system with a common discharge header. Valves~~ Pressure relief devices discharging into a common collection pipe may be affected by the discharge of other ~~valves~~ devices by the corrosion of parts in the outlet portion of the ~~valve~~ device or the buildup of products discharged from those ~~valves~~ devices;

g) Ability to coordinate with planned system shutdowns. The shutdown of a system for other maintenance or inspection activities is an ideal time for the operational inspection and test of a pressure relief device ~~valve~~;

h) Critical nature of the system. Systems that are critical to plant operation or where the effects of the discharge of fluids from the system are particularly detrimental due to fire hazard, environmental damage, or toxicity concerns all call for more frequent inspection intervals to ensure devices are operating properly; and

i) Where the effects of corrosion, blockage by system fluid, or ability of the ~~valve~~ pressure relief device to operate under given service conditions are unknown (such as in a new process or installation), a relatively short inspection interval, not to exceed one year or the first planned shutdown, whichever is shorter, shall be established. At that time the device shall be visually inspected and tested. If unacceptable test results are obtained, the inspection interval shall be reduced by 50% until suitable results are obtained.

3.2.6.2 ESTABLISHMENT OF SERVICE INTERVALS

a) The above intervals are guidelines for periodic inspection and testing. Typically, if there are no adverse findings, a pressure relief ~~valve~~ device would be placed back in service until the next inspection. Any unacceptable conditions that are found by the inspection shall be corrected immediately by repair or replacement of the device. Many users will maintain spare pressure relief devices so the process or system is not affected by excessive downtime.

PART 4, SECTION 4
PRESSURE RELIEF DEVICES — REPAIR OF PRESSURE RELIEF VALVES AND PIN DEVICES~~VALVES~~

4.1 SCOPE

This section provides requirements and guidelines that apply to repairs to pressure relief valves and pin devices.

a) Repairs may be required because of defects found during periodic inspection, testing, operation, or maintenance. Since pressure relief devices are provided for safety and the protection of personnel and property, repairs are often regulated by the Jurisdiction where the pressure relief device is installed. The Jurisdiction should be contacted for their specific requirements.

b) This section describes some of the administrative requirements for the accreditation of repair organizations. Additional administrative requirements can be found in NB-514, A*ccreditation of "VR" Repair Organizations*. Some Jurisdictions may independently administer a program of authorization for organizations to perform repairs within that Jurisdiction.

c) Requirements for repairs and alterations to pressure-retaining items and repair and replacement activities for nuclear items can be found in NBIC Part 3.

4.2 GENERAL REQUIREMENTS

a) Repair of a pressure relief valves or pin devices is considered to include the disassembly, replacement, re- machining, or cleaning of any critical part, lapping of a seat and disc, replace o-ring and seals reassembly, adjustment, testing, or any other operation that may affect the flow passage, capacity, function, or pressure-retaining integrity.

b) Conversions, changes, or adjustments (excluding those as defined in 3.2.5.2 a) or Part 2 Paragraph 2.5.7.2.a)) affecting critical parts are also considered repairs. The scope of conversions may include changes in service fluid and changes such as bellows, soft seats, and other changes that may affect Type/Model number provided such changes are recorded on the document as required for a quality system and the repair nameplate. (See 4.7.1)

c) The scope of repair activities shall not include changes in ASME Code status.

4.2.1 "VR" REPAIR

a) When a repair is being performed under the administrative requirements for National Board Accreditation, a repair shall consist of the following operations as a minimum:

   1) Complete disassembly, cleaning, and inspection of parts, repair or replacement of parts found to be defective, reassembly, testing as required by 4.6, sealing and application of a repair nameplate. When completed, the pressure relief valve's or pin device's condition and performance shall be equivalent to the standards for new valves.

   2) The administrative requirements for National Board Accreditation apply only to valves that are marked with the ASME Certification Mark and the "V", "UV", "UD" (for pin devices) "HV", or "NV" Designator or the sup- planted ASME "V", "UV", "UD"(for pin devices) "HV" or "NV" Code symbol and have been capacity certified on the applicable fluid by the National Board.

4.2.2 CONSTRUCTION STANDARDS FOR PRESSURE RELIEF DEVICES

For pressure relief devices, the applicable new construction standard to be used for reference during repairs is the ASME Code. ASME Code Cases shall be used for repairs when they were used in the original

construction of the valve. ASME Code Cases may be used when they have been accepted for use by the NBIC Committee and the Jurisdiction where the pressure-retaining item is installed.

a) For pressure relief devices, the Code Case number shall be noted on the repair document and, when required by the code case, stamped on the repair nameplate.

b) The Jurisdiction where the pressure retaining item is installed shall be consulted for any unique requirements it may have established.

4.2.3 INSTALLATION OF PRESSURE RELIEF DEVICES

Installation of a pressure relief device by mechanical methods is not considered to be a repair, as long as no changes or adjustments are made to the device. Seals installed by the device manufacturer or repair organization shall not be removed when the device is installed.

When a pressure relief device is to be installed by welding on an existing pressure retaining item, the requirements of Part 3 of the NBIC for welded repairs shall be followed.

If a pressure relief valve or pin device must be disassembled or its adjustments changed as part of the installation process, the reassembly, resetting, retesting or other such activities shall be done by a qualified organization which meets the requirements of NBIC Part 4. For a new pressure relief valve or pin device, the original ~~valve~~ manufacturer shall perform this activity as required by the original code of construction.

The installation of a non-reclosing pressure relief device or the replaceable element of a non-reclosing pressure relief device such as a rupture disk or pin is not considered to be a repair. The manufacturer's procedures and instruction shall be followed for the installation of these devices.

4.2.4 INITIAL ADJUSTMENTS TO PRESSURE RELIEF VALVES AND PIN DEVICES

The initial installation testing and adjustments of a new pressure relief valve and pin device on a boiler or pressure vessel are not considered a repair if made by the manufacturer or assembler of the valve and pin device.

4.3 MATERIALS FOR PRESSURE RELIEF VALVE AND PIN DEVICE REPAIR

The materials used in making repairs shall conform to the requirements of the original code of construction. The "VR" Certificate Holder is responsible for verifying identification of existing materials from original data, drawings, or unit records and identification of the materials to be installed.

4.3.1 REPLACEMENT PARTS FOR PRESSURE RELIEF DEVICES

a) Critical parts shall be fabricated by the pressure relief valve or pin device ~~-~~manufacturer or to the manufacturer's specifications. Critical parts are those that may affect the valve flow passage, capacity, function, or pressure-retaining integrity.

b) Critical parts not fabricated by the pressure relief valve or pin device manufacturer shall be supplied with material test certification
for the material used to fabricate the part.

c) Replacement critical parts receiving records shall be attached or be traceable to the pressure relief valve or pin device repair document (see 4.8.5.4 i)).These records shall conform to at least one of the following.

   1) Receiving records documenting the shipping origin of the part fabricated by the relief valve and pin device manufacturer (such as packing list) from the pressure relief valve and pin device ~~-~~ manufacturer or assembler of the pressure relief valve and pin device type.

   2) A document prepared by the "VR" Certificate Holder certifying that the replacement part used in the repair has the manufacturer's identification on the part or is otherwise labeled or tagged by the

manufacturer and meets the manufacturer's acceptance criteria (e.g., critical dimensions found in maintenance manual).

3) Receiving records for replacement critical parts obtained from a source other than the pressure relief valve or pin device ~~valve~~ manufacturer or assembler of the pressure relief valve or pin device ~~valve~~ type shall include a document that provides as a minimum:

   a. The part manufacturer and part designation.

   b. A certifying statement that either:

      1. The part was fabricated by the pressure relief valve and pin device ~~valve~~ manufacturer and meets the manufacturer's accep- tance criteria (e.g., critical dimensions found in maintenance manual), or

      2. The part meets the manufacturer's specifications and was fabricated from material as identified by the attached material test report.

   c. The signature of an authorized individual of the part source.

   d. The name and address of the part source for whom the authorized individual is signing.

d) Material for bolting shall meet the manufacturer's specification, but does not require material test certification if marked as required by the material specification.

4.4 WELDING FOR PRESSURE RELIEF VALVES AND PIN DEVICES

When welding is used as a repair technique during a pressure relief valve or pin device repair, the following requirements shall apply.

a) Welding shall be performed in accordance with the requirements of the original code of construction used for the pressure relief valve or pin device.

b) Cast iron and carbon or alloy steel having a carbon content of more than 0.35% shall not be welded.

c) Defects in pressure relief valve and pin device parts such as cracks, pits, or corrosion that will be repaired by welding shall be completely removed before the weld repair of the part is performed. Removal of the defect shall be verified by suitable NDE as required.

d) Consideration shall be given to the condition of the existing material, especially in the weld preparation area.

4.4.1 WELDING PROCEDURE SPECIFICATIONS

Welding shall be performed in accordance with Welding Procedure Specifications (WPS) qualified in accordance with the original code of construction. When this is not possible or practicable, the WPS may be qualified in accordance with Section IX of the ASME Code.

4.4.2 STANDARD WELDING PROCEDURE SPECIFICATIONS

A "VR" Certificate Holder may use one or more applicable Standard Welding Procedure Specifications shown in NBIC Part 3, 2.3.

4.4.3 PERFORMANCE QUALIFICATION

Welders or welding operators shall be qualified for the welding processes that are used. Such qualification shall be in accordance with the requirements of the original code of construction or Section IX of the ASME Code.

4.4.4 WELDING RECORDS

The "VR" Certificate Holder shall maintain a record of the results obtained in welding procedure qualifications, except for those qualifications for which the provisions of 4.4.2 are used, and of the results obtained in welding performance qualifications. These records shall be certified by the "VR" Certificate Holder and shall be available to the National Board.

4.4.5 WELDER'S IDENTIFICATION

The "VR" Certificate Holder shall establish a system for the assignment of a unique identification mark to each welder/welding operator qualified in accordance with the requirements of the NBIC. The "VR" Certificate Holder shall also establish a written procedure whereby welded joints can be identified as to the welder or welding operator who made them. This procedure shall use one or more of the following methods and shall be described in the quality control system written description. The welder's or welding operator's identification mark may be stamped (low stress stamp) adjacent to welded joints made by the individual, or the "VR" Certificate Holder may keep a documented record of welded joints and the welders or welding operators used in making the joints.

4.4.6 WELDER'S CONTINUITY

The performance qualification of a welder or welding operator shall be affected when one of the following conditions occur:

a) When the welder or welding operator has not welded using a specific process during a period of six months or more, their qualifications for that process shall expire.

b) When there is specific reason to question their ability to make welds that meet the specification, the qualification that supports the welding that is being performed shall be revoked. All other qualifications not questioned remain in effect.

4.4.7 WELD REPAIRS TO PRESSURE RELIEF VALVE AND PIN DEVICE PARTS BY AN "R" STAMP HOLDER

a) The quality system manual may include controls for the "VR" Certificate Holder to have the pressure relief valve part repaired by a National Board "R" Certificate Holder, per this section provided the following documentation is provided to the "R" Certificate Holder:

   1) Code of construction, year built;

   2) Part identification;

   3) Part material specified; and

   4) "VR" Certificate Holder's unique identifier for traceability as required by the repair inspection program.

b) Prior to performing weld repairs to pressure relief valve or pin device ~~(PRV)~~ parts, the "R" Certificate Holder shall receive repair information required by 4.4.7 a) from the "VR" Certificate Holder responsible for the pressure relief valve and pin device repair.

   1) Pressure relief valve and Pin Device ~~PRV~~ part weld repairs shall be performed under the "R" Certificate Holder's quality system; how- ever, the requirements for in-process involvement of the Inspector (see Part 3, 2.2.2) may be waived. The requirement for stamping is waived.

   2) The process of identifying and controlling repairs shall be documented in the "R" Certificate Holder's quality system.

3) Pressure relief valve and Pin Device ~~PRV~~ part repairs shall be documented on a Form R-1 with a statement under the "Remarks" section Pressure Relief Valve and Pin Device ~~"PRV~~ Part Repair." The owner's name and location of installation shall be that of the "VR" Certificate Holder. The information received from the "VR" Certificate Holder as required in 4.4.7 a) shall be noted under the "Description of Work" section.

4) Upon completion of the repair, the repaired part and completed Form R-1 shall be returned to the "VR" Certificate Holder responsible for completing the Pressure Relief Valve or Pin Device ~~PRV~~ repair.

4.5 HEAT TREATMENT

4.5.1 PREHEATING

Preheating may be employed during welding to assist in completion of the welded joint in accordance with NBIC Part 3, 2.5.1. The need for and the temperature of preheat are dependent on a number of factors, such as chemical analysis, degree of restraint of the items being joined, material thickness, and mechanical properties. The welding procedure specification for the material being welded shall specify the preheat temperature requirements.

4.5.2 POSTWELD HEAT TREATMENT

Postweld heat treatment shall be performed as required by the original code of construction in accordance with a written procedure. The procedure shall contain the parameters for postweld heat treatment. A time and temperature report or temperature record shall be maintained to document the work performed.

4.6 PRESSURE RELIEF VALVE AN PIN DEVICE PERFORMANCE TESTING AND TESTING EQUIPMENT

Each pressure relief valve and pin device to which the "VR" repair symbol stamp is to be applied shall be subjected to the following tests by the repair Certificate Holder.

4.6.1 TEST MEDIUM AND TESTING EQUIPMENT

Valves marked for steam service, or having special internal parts for steam service, shall be tested on steam. Valves marked for air, gas, or vapor service shall be tested with air or gas. Valves marked for liquid service shall be tested with water or other suitable liquid. ASME Code, Section IV hot-water valves, shall be tested on water, steam, or air. Pin devices shall be tested in accordance the manufacturer's specified procedures and test media.

a) Each pressure relief valve or pin device shall be tested to demonstrate the following:

1) Set pressure (as defined by the ~~valve~~ manufacturer and as listed in NB-18, *Pressure Relief Device Certifications);*

2) Response to blowdown, when required by the original code of construction;

3) Seat tightness; and

4) For pressure relief valves and pin devices designed to discharge to a closed system, the tightness of the secondary pressure zone shall be tested as required by the original code of construction.

b) The equipment used for the performance testing prescribed above shall meet the following requirements:

1) The performance testing equipment shall include a pressure vessel of adequate volume and

pressure source capacity to ensure compliance with 4.6.1 a) 1);

2) Prior to use, all performance testing equipment shall be qualified by the Certificate Holder to ensure that the equipment and testing procedures will provide accurate results when used within the ranges established for that equipment. This qualification may be accomplished by benchmark testing, comparisons to equipment used for verification testing as specified in the quality system, or comparisons to field performance. This qualification shall be documented. Documentation of this qualification shall be retained in accordance with Table 4.8.5.4 s). Documentation of this qualification shall include but not be limited to:

   a. Schematic of the performance test equipment;

   b. Size and pressure ranges of valves and pin devices to be tested and the test fluid to be used;

   c. Dimensions of test vessels;

   d. Accuracy of pressure measuring equipment;

   e. Size and design type of valves used to control flow; and

   f. Method of qualifying.

3) Prior to the implementation of any addition or modification to the testing equipment that would alter the contents of the document required in 4.6.1 b) 2), the Certificate Holder shall re-qualify the performance test equipment in accordance with 4.6.1 b) 2). If the equipment changed was used to satisfy the requirements of verification testing, the Certificate Holder shall notify the National Board and additional verification testing, in accordance with the quality system, may be required.

Commented [AC1]: You cannot TEST a Non-Reclosing PRD.
IS THIS GOING TO BE IN ACCORDANCE WITH ASME SEC VIII-1, UG-138(d)(4)?

Commented [CB2R1]: I hope I am not missing the point here - A non-reclosing "Buckling Pin" PRD can be manually closed and install a new pin for service or for VR testing.

Commented [CB3R1]:

4.6.2 OWNER-USER ASME CODE SECTION VIII STEAM TESTING

When ASME Code Section VIII valves are repaired by the owner for the owner's own use, valves for steam service may be tested on air for set pressure and, if possible, blowdown adjustment, provided the valve manufacturer's corrections for differential in set pressure between steam and air are applied to determine the test pressure as follows:

a) The test pressure using air as the test medium shall be the product of the Manufacturer's correction factor for the differential between steam and air multiplied by the set pressure. If a cold differential test pressure is applicable due to superimposed back pressure and/or service temperature, then the manufacturer's correction factor shall be applied to the cold differential test pressure. The test pressure shall be recorded on the valve repair document described in 4.8.5.4 i).

b) The correction factor between steam and air shall not be included in the cold differential test pressure marked on the valve repair nameplate per 4.7.2 b) 8).

4.6.3 LIFT ASSIST TESTING

a) A device may be used to apply an auxiliary lifting load on the spring of a repaired valve to establish the set pressure in lieu of the tests required in 4.6.1 a) 1) when such testing at full pressure:

   1) May cause damage to the valve being tested; or

   2) Is impractical when system design considerations preclude testing at full pressure.

b) While actual valve blowdown and valve performance characteristics cannot be verified using this testing technique, valve set pressure may be determined to an acceptable degree of accuracy if, as a mini- mum:

   1) Equipment utilized is calibrated as required in the quality system; including, but not limited to:

      a. System pressure measurement equipment;

      b. Lifting force measurement equipment; and

c. Other measuring elements required by the device manufacturer.

2) the device and test procedures that have proved to give accurate results are used andfollowed;

3) A static inlet pressure is applied with the test medium specified in 4.6.1; and

4) Adjustments are made in accordance with the valve manufacturer's recommendations to ensure proper lift and blowdown.

c) Prior to use, all lift assist devices shall be qualified by the Certificate Holder to ensure that the equipment and testing procedures will provide accurate results when used within the ranges established for that equipment used for verification testing as specified in the quality system or comparisons to field performance. This qualification shall be documented and provisions made to retain such documentation in accordance with Table 4.8.5.4 s). Documentation of this qualification shall include but not be limited to:

1) A description of the lift assist device including model number, serial number and manufacturer;

2) Size and pressure ranges of valves to be tested with the lift assist device and the test fluid to be used;

Note: Maximum set pressure is determined by available lift force and system pressure.

3) Accuracy of pressure measuring equipment; and

4) Method of qualifying.

d) After initial qualification of the device the device shall be re-qualified if:

1) Modifications or repairs to the device are made which would affect test results; or

2) The manufacturer issues a mandatory recall or modification to the device which will affect test results.

Commented [AC4]: Insert space between "and" & "manufacturer."

4.6.4 PRESSURE TEST OF PARTS

a) Parts used in repaired pressure relief valves and pin devices shall be pressure tested and documentation provided according to the following categories:

1) Replacement Parts

The "VR" Certificate Holder is responsible for documentation that the appropriate pressure test has been completed as required by the original code of construction.

2) Parts Repaired by Welding

These parts shall be subjected to a pressure test required by the original code of construction. The "VR" Certificate Holder shall be responsible for documentation of such test.

b) Parts repaired by re-machining within part specifications, lapping, or polishing do not require a pressure test.

4.7 STAMPING REQUIREMENTS FOR PRESSURE RELIEF DEVICES

4.7.1 NAMEPLATES

Proper marking and identification of tested or repaired pressure relief valves and pin devices is critical to ensuring acceptance during subsequent inspections, and also provide for traceability and identification of any changes made to the pressure relief valve and pin device. All operations that require pressure relief valve's and pin device's seals to be replaced shall be identified by a nameplate as described in 4.7.2 or 4.7.4.

(19) 4.7.2 REPAIR NAMEPLATE

When a pressure relief valve and pin device is repaired, a metal repair nameplate stamped with the information required below shall be securely attached to the valve and pin device adjacent to the original manufacturer's stamping or nameplate. If not installed directly on the pressure relief valves and pin device the nameplate shall be securely attached to the valve and pin device independent of the external adjustment seals in a manner that does not interfere with valve and pin device operation and sealed in accordance with the quality system.

a) Prior to attachment of the repair nameplate, the previous repair nameplate, if applicable, shall be removed from the repaired valve.

b) As a minimum, the information on the pressure relief valve and pin device repair nameplate (see Figure 4.7.2-a) shall include:

1) The name of the repair organization preceded by the words "repaired by";

2) The "VR" repair symbol stamp and the "VR" certificate number;

3) Unique identifier (e.g., repair serial number, shop order number, etc.);

4) Date of repair;

5) Set pressure;

6) Capacity and capacity units (if changed from original nameplate due to set pressure or service fluid change)

7) Type/Model number (if changed from original nameplate by a conversion. See 4.2); and

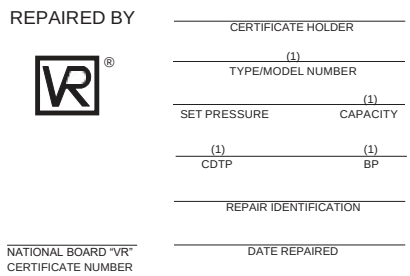
8) When an adjustment is made to correct for service conditions of superimposed back pressure and/or temperature or the differential between popping pressure between steam and air (see 4.6.2), the information on the valve repair nameplate shall include the:

a. Cold Differential Test Pressure (CDTP); and

b. Superimposed Back Pressure (BP) (only when applicable).

FIGURE 4.7.2-a

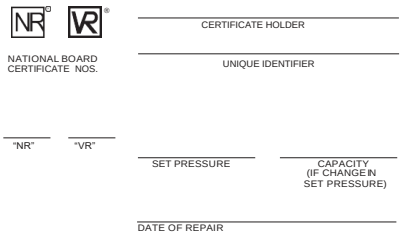
REQUIRED MARKINGS FOR REPAIR OF ASME/NATIONAL BOARD "V," "UV,", " UD" AND "HV"-STAMPED PRESSURE RELIEF VALVES **AND PIN DEVICES**



Note:. To be indicated only when changed.

FIGURE 4.7.2-b

REQUIRED MARKINGS FOR REPAIR OF NUCLEAR PRESSURE RELIEF VALVE **AND PIN DEVICE**



4.7.3 CHANGES TO ORIGINAL PRESSURE RELIEF VALVE AND PIN DEVICE NAMEPLATE INFORMATION

a) If the set pressure is changed, the set pressure, capacity, and blowdown, if applicable, on the original nameplate or stamping shall be marked out but left legible. The new capacity shall be based on that for which the pressure relief valve **or** pin device was originally certified.

b) If the service fluid is changed, the capacity, including units, on the original nameplate or stamping shall be marked out but left legible. The new capacity shall be based on that for which the pressure relief valve **or** pin device was originally certified, or if a conversion has been made, as described in 4.2 on the capacity certification for the pressure relief valve **or** pin device as converted. Similarly, the certified flow resistance for pin device shall be updated if effected by of change in service fluid.

c) If the Type/Model number is changed, the Type/Model number on the original nameplate or stamping shall be marked out but left legible.

d) If the blowdown is changed, the blowdown, if shown on the original nameplate or stamping, shall be marked out but left legible. The new blowdown may be based on the current ASME Code requirements.

e) Repair organizations shall verify the Type/Model number, inlet size, set pressure, and capacity on the original nameplate or stamping that is not marked out. Incorrect information on the original manufacturer's nameplate or stamping shall be marked out but left legible. Corrected information shall be indicated on the repair nameplate and noted on the document as required by the quality system.

4.7.4 REPLACEMENT OF ILLEGIBLE OR MISSING NAMEPLATES

The VR Certificate Holder shall not perform repairs under the VR Program on any pressure relief valve (PRV) or pin device that cannot be positively identified by the manufacturer or through in-house sources. Such identification shall include the verification of the original ASME Stamping. Pressure relief valves or Pin Devices that have missing or illegible nameplates and can be positively identified shall be equipped with a nameplate marked "DUPLICATE", which contains all original nameplate data. The duplicate nameplate shall not bear the "NB" Mark or the ASME Certification Mark with the "V", "HV", ~~or~~ "UV" or "UD" Designator or the supplanted "V", "HV", ~~or~~ "UV" or "UD" Symbol. Instead, the nameplate shall be stamped "Sec. I", "Sec. IV", or "Sec. VIII", as applicable, to indicate the original stamping. Illegible nameplates, if applicable, shall not be removed.

4.8 ACCREDITATION OF "VR" REPAIR ORGANIZATIONS

4.8.1 SCOPE

a) This section provides requirements that must be met for an organization to obtain a National Board *Certificate of Authorization* to use the "VR" Symbol Stamp for repair activities of pressure relief devices constructed in accordance with the requirements of the ASME Code.

b) For administrative requirements to obtain or renew a National Board "VR" *Certificate of Authorization* and "VR" Symbol Stamp, refer to NB-514, *Accreditation of "VR" Repair Organizations*.

4.8.2 JURISDICTIONAL PARTICIPATION

The National Board member Jurisdiction in which the "VR" organization is located is encouraged to participate in the review and demonstration of the applicant's quality system. The Jurisdiction may require participation in the review of the repair organization and the demonstration and acceptance of the repair organization's quality system manual.

4.8.3 ISSUANCE AND RENEWAL OF THE "VR" *CERTIFICATE OF AUTHORIZATION*

4.8.3.1 GENERAL

Authorization to use the stamp bearing the official National Board "VR" symbol as shown in Figure 4.7.2-a, will be granted by the National Board pursuant to the provisions of the following administrative rules and procedures.

4.8.3.2 ISSUANCE OF CERTIFICATE

Repair organizations, manufacturers, assemblers, or users that make repairs to the ASME Code symbol stamped or marked pressure relief valves **and pin devices** and National Board capacity certified pressure relief valves **and pin devices** may apply to the National Board for a *Certificate of Authorization* to use the "VR" symbol.

4.8.4 USE OF THE "VR" *CERTIFICATE OF AUTHORIZATION*

4.8.4.1 TECHNICAL REQUIREMENTS

The administrative requirements of 4.8 for use of the "VR" stamp shall be used in conjunction with the technical requirements for valve repair as described in sections 4.1 through 4.7. Those requirements shall be mandatory when a "VR" repair is performed.

4.8.4.2 STAMP USE

Each "VR" symbol stamp shall be used only by the repair firm within the scope, limitations, and restrictions under which it was issued.

4.8.5 QUALITY SYSTEM

4.8.5.1 GENERAL

Each applicant for a new or renewed "VR" *Certificate of Authorization* shall have and maintain a quality system which shall establish that all of these rules and administrative procedures and applicable ASME Code requirements, including material control, fabrication, machining, welding, examination, setting, testing, inspection, sealing, and stamping will be met.

4.8.5.2 WRITTEN DESCRIPTION

A written description, in the English language, of the system the applicant will use shall be available for review and shall contain, as a minimum, the features set forth in 4.8.5.4. This description may be brief or voluminous, depending upon the projected scope of work, and shall be treated confidentially. In general, the quality system shall describe and explain what documents and procedures the repair firm will use to validate a valve repair.

4.8.5.3 MAINTENANCE OF CONTROLLED COPY

Each applicant to whom a "VR" *Certificate of Authorization* is issued shall maintain thereafter a controlled copy of the accepted quality system manual with the National Board. Except for changes that do not affect the quality system, revisions to the quality system manual shall not be implemented until such revisions are accepted by the National Board.

(19) 4.8.5.4 OUTLINE OF REQUIREMENTS FOR A QUALITY SYSTEM

The following establishes the minimum requirements of the written description of the quality system. It is required that each valve repair organization develop its own quality system that meets the requirements of its organization. For this reason it is not possible to develop one quality system that could apply to more than one organization. The written description shall include, as a minimum, the following features:

a) Title Page

The title page shall include the name and address of the company to which the National Board *Certificate of Authorization* is to be issued.

b) Revision Log

A revision log shall be included to ensure revision control of the quality system manual. The log should contain sufficient space for date, description and section of revision, company approval, and National Board acceptance.

c) Contents Page

The contents page shall list and reference, by paragraph and page number, the subjects and exhibits contained therein.

d) Statement of Authority and Responsibility

A statement of authority and responsibility shall be dated and signed by an officer of the company. It shall include:

1) A statement that the "VR" stamp shall be applied only to pressure relief valves and pin devices that meet both ofthe following conditions:

a. Are marked with the ASME Certification Mark and the "V", "UV", "HV"," UD" or "NV" Designator or the supplanted ASME "V", "UV", "HV", "UD" or "NV" Code symbol and have been capacity certified by the National Board; and

b. Have been disassembled, inspected, and repaired by the Certificate Holder such that the pressure relief valves and pin devices condition and performance are equivalent to the standards for new pressure relief valves and pin devices.

2) The title of the individual responsible to ensure that the quality system is followed and who has authority and freedom to effect the responsibility;

3) A statement that if there is a disagreement in the implementation of the written quality system, the matter is to be referred to a higher authority in the company for resolution; and

4) The title of the individual authorized to approve revisions to the written quality system and the method by which such revisions are to be submitted to the National Board for acceptance before implementation.

e) Organization Chart

A chart showing the relationship between management, purchasing, repairing, inspection, and quality control personnel shall be included and shall reflect the actual organization in place.

f) Scope of Work

1) The scope of work section shall indicate the scope and type of valve repairs, including conversions the organization is capable of and intends to perform. The location of repairs (shop, shop and field, or field only), ASME Code Section(s) to which the repairs apply, the test medium (air, gas, liquid, or

steam, or combinations thereof), and special processes (machining, welding, postweld heat treatment, or nondestructive examination, or combinations thereof) shall be specifically addressed.

2) The types and sizes of valves to be repaired, pressure ranges and other limitations, such as engineering and test facilities, should also be addressed.

g) Drawings and Specification Control

The drawings and specification control system shall provide procedures assuring that the latest applicable drawings, specifications, and instructions required are used for valve repair, including conversions, inspection, and testing.

h) Material and Part Control

The material and part control section shall describe purchasing, receiving, storage, and issuing of parts.

1) The title of the individual responsible for the purchasing of all material shall be stated.

2) The title of the individual responsible for certification and other records as required shall be stated.

3) All incoming material and parts shall be checked for conformance with the purchase order and, where applicable, the material specifications or drawings. Indicate how material or part is identified and how identity is maintained by the quality system.

i) Repair and Inspection Program

The repair and inspection program section shall include reference to a document (such as a report, traveler, or checklist) that outlines the specific repair and inspection procedures used in the repair of pressure relief valves and pin devices. Repair procedures shall require verification that the critical parts meet the pressure relief valves and pin devices manufacturer's specification. Supplement 4 outlines recommended procedures covering some specific items. This document shall be retained in accordance with Table 4.8.5.4s).

1) Each pressure relief **valves and pin devices** or group of pressure relief valves and pin devices shall be accompanied by the document referred to above for processing through the plant. Each pressure relief valves and pin devices shall have a unique identifier (i.e., repair serial number, shop order number, etc.) appearing on the repair documentation and repair nameplate such that traceability is established.

2) The document referred to above shall describe the original nameplate information, including the ASME Code symbol stamping and the repair nameplate information, if applicable. In addition, it shall include material checks, replacement parts, conversion parts (or both), reference to items such as the welding procedure specifications (WPS), fit up, NDE technique, heat treatment, and pressure test methods to be used. Application of the "VR" stamp to the repair nameplate shall be recorded in this document. Specific conversions performed with the new Type/Model number shall be recorded on the document. There shall be a space for "signoffs" at each operation to verify that each step has been properly performed.

3) The system shall include a method of controlling the repair or replacement of critical pressure relief valves and pin devices parts. The method of identifying each spring shall be indicated on the repair document describedin **4.8.5.4** i). Such identification shall be based on the Manufacturer's spring chart current at the time of the repair, except that the spring removed from the valve during the repair bearing different identification may be reinstalled provided the "VR" Certificate Holder has verified the spring is acceptable to the Manufacturer. Such verification shall be documented on the repair document described in 4.8.5.4 i).

4) The system shall also describe the controls used to ensure that any personnel engaged in the repair of pressure relief valves and pin devices are trained and qualified in accordance with this section.

j) Welding, NDE, and Heat Treatment (when applicable)

The quality system manual shall indicate the title of the person(s) responsible for and describe the system used in the selection, development, approval, and qualification of welding procedure specifications, and the qualification of welders and welding operators in accordance with the provisions of 4.4.

1) The quality system manual may include controls for the "VR" Certificate Holder to have the pressure relief valves and pin devices part repaired by a National Board "R" Certificate Holder, per 4.4.7.

2) The completed Form R-1 shall be noted on and attached to the "VR" Certificate Holder's document required in 4.8.5.4 i). Similarly, NDE and heat treatment techniques must be covered in the quality system manual. When outside services are used for NDE and heat treatment, the quality system manual shall describe the system whereby the use of such services meet the requirements of the applicable section of the ASME Code.

k) Pressure Relief valves and pin devices Testing, Setting, and Sealing

The system shall include provisions that each pressure relief valves and pin devices shall be tested, set, and all external adjustments sealed according to the requirements of the applicable ASME Code Section and the National Board. The seal shall identify the "VR" Certificate Holder making the repair. Abbreviations or initials shall be permit- ted, provided such identification is acceptable to the National Board.

l) Pressure relief valves and pin devices Repair Nameplates

An effective pressure relief valves and pin devices stamping system shall be established to ensure proper stamping of each pressure relief valves and pin devices as required by 4.7.2. The manual shall include a description of the nameplate or a drawing.

m) Calibration

1) The manual shall describe a system for the calibration of examination, measuring, and test equipment used in the performance of repairs. Documentation of these calibrations shall include the standard used and the results. Calibration records shall be retained in accordance with Table 4.8.5.4 s).

2) All calibration standards shall be calibrated against certified equipment having known valid relationships to nationally recognized standards.

n) Manual Control

The quality system shall include:

1) Measures to control the issuance of and revisions to the quality system manual;

2) Provisions for a review of the system in order to maintain the manual current with these rules and the applicable sections of the ASME Code;

3) The title(s) of the individual(s) responsible for control, revisions, and review of the manual;

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

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

o) Nonconformities

The system shall establish measures for the identification, documentation, evaluation, segregation, and disposition of nonconformities. A nonconformity is a condition of any material, item, product, or process in which one or more characteristics do not conform to the established requirements. These may include,

TABLE 4.8.5.4 s)

Reports, Records, or Documents for "VR" Certificate Holders	Instructions	Minimum Retention Period
Form "R" reports associated with a pressure relief valve that required welding as part of the repair	Record retention shall be in accordance with Part 3, Table 1.5.1	Refer to Part 3, Table 1.5.1
Record of repair or inspection	The repair and inspection program section shall include reference to a document (such as a report, traveler, or checklist) that outlines the specific repair and inspection procedures used in the repair of pressure relief valves and pin devices	5 years
Records related to equipment qualification and instrument calibration	Prior to use, all performance testing equipment shall be qualified by the certificate holder to ensure that the equipment and testing procedures will provide accurate results when used within the ranges established for that equipment. This qualification may be accomplished by benchmark testing, comparisons to equipment used for verification testing as specified in the quality system, or comparisons to field performance.	5 years after the subject piece of equipment or instrument is retired.
Record of lift assist device qualification	Prior to use, all lift assist devices shall be qualified by the certificate holder to ensure that the equipment and testing procedures will provide accurate results when used within the ranges established for that equipment used for verification testing as specified in the quality system or comparisons to field performance. This qualification shall be documented.	5 years after the lift assist device is retired.
Records of employee training and qualification	Each repair organization shall establish minimum qualification requirements for those positions within the organization as they directly relate to pressure relief valves and pin devices repair. Each repair organization shall document the evaluation and acceptance of an individual's qualification for the applicable position.	5 years after termination of employment.

4.8.6 FIELD REPAIR

Repair organizations may obtain a "VR" *Certificate of Authorization* for field repair, either as an extension to their in-shop/plant scope, or as a field-only scope, provided that:

a) Qualified technicians in the employ of the Certificate Holder perform such repairs;

b) An acceptable quality system covering field repairs, including field audits, is maintained; and

c) Functions affecting the quality of the repaired valves are supervised from the address of record where the "VR" certification is issued.

4.8.6.1 AUDIT REQUIREMENTS

Upon issuance of a *Certificate of Authorization*, provided field repairs are performed, annual audits of the work carried out in the field shall be performed to ensure that the requirements of the Certificate Holder's quality system are met. The audit shall include, but not be limited to performance testing in accordance with 4.6 of valve(s) that were repaired in the field. The audits shall be documented.

4.8.6.2 USE OF OWNER OR USER PERSONNEL

For the repair of pressure relief valves and pin devices at an owner or user's facility for the owner or user's own use, the "VR" Certificate Holder may utilize owner or user personnel to assist Certificate Holder technician(s) in the performance of repairs provided:

a) The use of such personnel is addressed in the "VR" Certificate Holder's quality system;

b) The owner or user personnel are trained and qualified in accordance with Supplement 3;

c) Owner or user personnel work under direct supervision and control of the "VR" Certificate Holder's technician(s) during any stage of the repair when they are utilized;

d) The "VR" Certificate Holder shall have the authority to assign and remove owner or user personnel at its own discretion; and

e) The names of the owner or user personnel utilized are recorded on the document as required for a quality system.

4.9 TRAINING AND QUALIFICATION OF PERSONNEL

4.9.1 CONTENTS OF TRAINING PROGRAM

The repair organization shall establish a documented in-house training program. This program shall establish training objectives and provide a method of evaluating training effectiveness. As a minimum, training objectives for knowledge level shall include:

a) Applicable ASME Code and NBIC requirements;

b) Responsibilities within the organization's quality system; and

c) Knowledge of the technical aspects and mechanical skills for the applicable position held.

SUPPLEMENT 4
RECOMMENDED PROCEDURES FOR REPAIRING PRESSURE RELIEF VALVES

S4.1 INTRODUCTION

a) It is essential that the repair organization establish basic, specific procedures for the repair of pressure relief valves and pin devices. The purpose of these recommended procedures is to provide the repair organization with guidelines for this important aspect of pressure relief valve and pin devices repair. It is realized that there are many types of pressure relief valves and pin devices 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 pressure relief valves and pin devices.

b) Prior to removal, repair, or disassembly of a pressure relief valve and pin device 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 pin devices and S4.3 contains recommended procedures for the repair of pilot operated types of pressure relief valves, S4.4 contains recommended procedures for the repair of pin devices. Information on packaging, shipping and transportation is included as S4.5.

S4.2 SPRING-LOADED PRESSURE RELIEF VALVES

a) Visual inspection as received

1) This information is to be recorded:

a. Record user (customer) identification number;

b. Complete original PRV nameplate data, previous repair nameplate data, plus any important information received from customer;

c. Check external adjustment seals for warranty repair;

d. Check bonnet for venting on bellows type valves; and

e. Check appearance for any unusual damage, missing, or misapplied parts.

2) If sufficient damage or other unusual conditions are detected that may pose a safety risk during preliminary testing, then proceed directly to S4.2 c).

3) Valves that are to be repaired in place proceed to S4.2 c) unless preliminary testing has been authorized by the owner.

b) Preliminary test as received

1) Information from the recommended preliminary performance test and subsequent disassembly and inspections will provide a basis for any repair interval change that should be necessary to ensure that the valve will function as intended.

2) Determine set pressure or Cold Differential Test Pressure (CDTP) in accordance with manufacturer's recommendations and appropriate ASME Code Section. Do not allow test pressure to exceed 116% of set pressure unless otherwise specified by the owner. A minimum of three tests is usually required to obtain consistent results.

3) If results do not correlate with field performance, then steps to duplicate field conditions (fluid and temperature) may be necessary.

4) Record preliminary test results and test bench identification data.

g) Nameplate

The repairer will place a repair nameplate on each repaired valve. The nameplate, as a minimum, shall meet the requirements of 4.7.1.

S4.4 Pin Devices:

Prior to removal of A pin device from a system for a repair or any disassembly, ensure that all sources of pressure have been removed from the pin device.

a) Visual inspection as received
   1. This information is to be recorded:
      a. Record user (customer) identification number.
      b. Complete original pin device nameplate data, previous repair nameplate data, plus any important information received from customer.
      c. Check tamper proof seals are intact.
      d. Check bonnet top, columns and buckling pin screw for any damage or bending. Bent columns will result in a misalignment of the upper and lower pin holders and cause valve to malfunction and shall be removed from service.
   2. Check appearance for any unusual damage, missing, or misapplied parts per manufacturers assembly drawing.
   3. If sufficient damage or other unusual conditions are detected that may pose a safety risk during preliminary testing, then proceed directly to S4.4 c)
   4. For Pin devices that are to be repaired in place, proceed to S4.4 c) unless preliminary testing has been requested by the owner.

b) Preliminary test as received
   1. Information from the recommended preliminary performance test and subsequent disassembly and inspections will provide a basis for any repair interval change that should be necessary to ensure that the pin device will function as intended.
   2. One of ~~T~~the following tests should be done on Pin Device.
      a. Measure lift force to move plug from closed position to open position. This can be done with pull gage or by using pressure WITHOUT pin.. Repeat 3 times and record the data. Review with manufacturer's original data.
      b. Reseat the plug fully into seat following manufacturer guidelines. Some manufacturers supply a tool for this purpose. This usually can be done by turning the adjuster Buckling Pin Screw on top by hand. If this cannot be done by hand, apply a torque wrench onto the pin adjuster hex and measure the torque required to fully seat. Compare the required torque to seat with manufacturer's original data.
      c. Conduct one(1) set pressure tests using the manufacturer's pin designated for this specific valve. Do not allow test pressure to exceed 110% of set pressure unless otherwise specified by the owner.
   3. If test results from S4.4b) 2 are outside the manufacturer's recommendation, and set pressure tests are outside the ASME limits or agreed upon tolerance as stated on tag, proceed to S4.4 c) Disassembly.
   4. Record test results and test bench identification data.

c) Disassembly
   1. Remove Buckling Pin Protective Cage(screen), if applicable

Commented [AC5]: *Is this for a PIN Device?*

Commented [AC6]: *Is this for a PIN Device?*

2. Prior to any disassembly, ensure that the plug is re-seated following manufacturer guidelines . Reseating may require torque wrench as specified in S4.4b)2.a Once seated, remove any gag or shipping pin if applicable.

3. Remove the required seals on bonnet flange bolts, if applicable.

~~3.~~4. 4. Remove the bonnet flange bolts.

5. Remove the bonnet "Flange Assembly - with bonnet flange, columns, upper pin holder top and buckling pin adjuster screw". Lift the bonnet Flange Assembly straight up vertically using a strap on the upper pin holder top.

6. Remove the bonnet/plug assembly out of seat using thread or nut on top of plug assembly. Be careful not to damage top of plug assembly where buckling pin sets.
    a. As the plug assembly is lifted out of body, handle the assembly carefully and lay it on clean surface. Be careful to not damage plug seat area during this step.

7. Remove the plug from the bonnet. Inspect all seals and replace per manufacturer's instructions. Check bonnet bore for cleanliness and for wear and scratches. In the event there is minor scratches you may polish this bore. Pay special attention as not to remove material from this bore as this is a critical dimension.

8. Remove plug seat, if applicable, in body and clean and replace seals per manufacturer's instructions.

d) Cleaning

1. Clean Adjusting screw or holding nut.
2. Thoroughly clean all small parts (Caution: do not use a cleaning method that will damage the parts.)
3. Do not clean in a chemical solution except under acceptable circumstances.
4. Protect seating surfaces and nameplates prior to cleaning.
5. Clean inside of valve body as needed.

e) Inspection

1. Check all parts for corrosion
2. Check nozzle for cracks (NDE as applicable) or unusual wear.
3. Check plug and stem assembly for cracks (NDE as applicable) or unusual wear.
4. Check bonnet guide for wear
5. Check adjusting screw or holding nut free of galling or damage.
6. Check flange gasket facings for wear and cuts.
7. Check pin bearing points for fit and engagement.

f. Assembly

1. Intall the Seat to the body.
2. Install the plug back into bonnet with new seals and ensure plug is moving freely per manufacturer's instructions. If moving freely install nut on the piston/plug and set aside for reinstalling the assembly back onto the valve body.
3. Install bonnet plug assembly back into the body carefully

Commented [AC7]: manufacturer

4. Make sure the plug is inserted and fully seated into the plug seat and moving freely after installing the bonnet flange and tightening up the flange studs. This is where centering is very important to get the free movement of plug inside the plug seat per manufacturer's instructions
5. Use pressure for measuring the open pressure without pin. The manufacturer to supply the original manufacturer's load or pressure measurements

g. Testing

1. Test data shall be recorded. Testing will be done in accordance with manufacturer's recommendations and appropriate ASME Code section. To preclude unsafe and unstable pin device ~~valve~~ operations or erroneous performance test results, it is recommended that low volume testing equipment (e.g., gas cylinders with- out a test vessel, hand pumps, tubing) should be avoided.

h .Sealing

1. After final adjusting and acceptance by quality control inspection, all external adjustments shall be sealed with a safety seal providing a means of identification of the organization performing the repair.

i. Nameplate

1. The repairer will place a repair nameplate on each repaired pin device ~~valve~~. The nameplate shall, as a minimum, meet the requirements of 4.7.1.

j. Installation of new pin

a. For pin devices with shipping pins, with zero pressure on the inlet or outlet, the shipping pin shall be removed and replaced with pin tagged and traceable to the manufacturer and matches the set pressure, service and pin device ~~valve~~ name plate information.

b. Install pins that are straight and without any deflection, visual defect or damage. c.

Ensure Pin device piston assembly moves freely without excessive resistance or force.

d. Piston assemble will be reseated and pin installed per manufacturer recommendations.

S4.~~5~~4 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:

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

2) Pressure relief **valves and pin devices** 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 pressure relief **valves and pin devices** 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

Commented [AC8]: *Is this in accordance with UG-138(d)(4)? Will the VR Shop need to do the multiple PIN Tests?*

Commented [CB9R8]: Yes

Commented [CB10R8]:

Commented [AC11]: *Is this for Pin Devices?*

Commented [CB12R11]: Yes, this is for Pin Devices. However, I do not understand the issue with low volume test equipment and how this can produce unsafe or unstable operations or erroneous performance results. These tests are done in the VR shop.

Commented [CB13R11]:

Commented [CB14R11]:

Commented [AC15]: *Is this for a Pin Device?*

Commented [CB16R15]: Yes

Commented [CB17R15]:

Commented [AC18]: *Is this in Lieu of actual testing of the Device? If so, I do NOT agree. There is NO test performed.*

Commented [CB19R18]: No, this installation instruction is for installing a new buckling pin for service. The term "piston assembly" is the term used for reseating the valve prior to installing a new pin for service. If the valve seat is dirty or the plug is not aligned properly, this will affect the operation of the PRD.

Commented [CB20R18]:

Commented [AC21]: *Is this for a PIN Device?*

Commented [CB22R21]: Yes

Commented [CB23R21]:

breakage.

5) Pressure relief **valves and pin devices** for special services, including but not limited to oxygen, chlorine, and hydrogen perox~~-~~ide, should be packaged in accordance with appropriate standards and/or owner procurement requirements.

National Board Commissioned Inspector — An individual who holds a valid and current National Board Commission.

NBIC — The *National Board Inspection Code* published by The National Board of Boiler and Pressure Vessel Inspectors.

Nuclear Items — Items constructed in accordance with recognized standards to be used in nuclear power plants or fuel processing facilities.

Original Code of Construction — Documents promulgated by recognized national standards writing bodies that contain technical requirements for construction of pressure-retaining items or equivalent to which the pressure-retaining item was certified by the original manufacturer.

Overfire Air — Air admitted to the furnace above the grate surface /fuel bed. Used to complete the combustion of fine particles, in suspension. Also aids in reducing NOx formation.

Owner or User — As referenced in lower case letters means any person, firm, or corporation legally responsible for the safe operation of any pressure-retaining item.

Owner-User Inspection Organization — An owner or user of pressure-retaining items that maintains an established inspection program, whose organization and inspection procedures meet the requirements of the National Board rules and are acceptable to the Jurisdiction or Jurisdictional Authority wherein the owner or user is located.

Owner-User Inspector — An individual who holds a valid and current National Board Owner-User Commission.

Piecing — A repair method used to remove and replace a portion of piping or tubing material with a suitable material and installation procedure.

Pilot Operated Pressure Relief Valve — A pressure relief valve in which the disk is held closed by system pressure, and the holding pressure is controlled by a pilot valve actuated by system pressure.

Pin Device: A pin device is a nonreclosing pressure relief device actuated by inlet static or differential pressure and designed to function by the activation of a load bearing section of a pin that supports a pressure-containing member. A pin is the load bearing activation component of a pin device its crosssectional area is not limited to a circular shape. A pin device body is the structure that encloses the pressure-containing members.

Pin Device – Capacity Certified: Pin device certified in accordance with ASME BPVC Section XIII par 9.7.3 thru 9.7.6.

Pin Device – Flow Resistance certified: Pin device certified in accordance with ASME BPVC Section XIII par. 9.7.7

Plate Heat Exchanger (PHE) — An assembly of components consisting of heat transfer plates and their supporting frame. The frame provides structural support and pressure containment and may consist of fixed endplates, moveable endplates, an upper carrying bar and lower guide bar which provide plate alignment, and frame compression bolts.

Pneumatic Test — A pressure test which uses air or another compressible gas as the test medium.

Potable Water Heaters — A corrosion resistant appliance that includes the controls and safety devices to supply potable hot water at pressure not exceeding 160 psig (1,100 kPa) and temperature not in excess of 210°F (99°C).

Fired Storage Water Heater — A potable water heater in which water is heated by electricity, the combustion of solid, liquid, or gaseous fuels and stores water within the same appliance.

Indirect Fired Water Heater — A potable water heater in which water is heated by an internal coil or heat exchanger that receives its heat from an external source. Indirect fired water heaters provide water

PART 4, SECTION 3
PRESSURE RELIEF DEVICES — IN-SERVICE INSPECTION OF PRESSURE RELIEF DEVICES

3.1 SCOPE

This section provides general guidelines and requirements for conducting in-service inspection and testing of pressure relief devices.

The inspection of pressure relief devices is often coordinated with the inspection of the system. See NBIC Part 2 for in-service inspection requirements and procedures for other portions of the equipment not discussed in this section.

3.2 GENERAL

a) The most important appurtenances on any pressurized system are the pressure relief devices provided for overpressure protection of that system. These are devices such as pressure relief valves, rupture disks, and other non-reclosing devices that are called upon to operate and reduce an overpressure condition.

b) These devices are not designed or intended to control the pressure in the system during normal operation. Instead, they are intended to function when normal operating controls fail or abnormal system conditions are encountered.

c) Periodic inspection and maintenance of these important safety devices is critical to ensure their continued functioning and to provide assurance that they will be available when called upon to operate. See 3.2.6 for recommended testing frequency for PRDs.

d) Inspection areas of concern include:

1) Correct set pressure (matching of set pressure to MAWP);

2) Safety considerations;

3) Device data;

4) Condition of the device;

5) Condition of the installation; and

6) Testing and operational inspection.

3.2.1 PRESSURE RELIEF DEVICE DATA

a) Nameplate marking or stamping of the device should be compared to stamping on the protected pressure-retaining item. For a single device, the set pressure shall be no higher than the maximum allowable working pressure (MAWP) marked on the protected pressure-retaining item or system.

b) When more than one pressure relief device is provided to obtain the required capacity, only one pressure relief device set pressure need be at or below the maximum allowable working pressure. The set pressure of additional devices may exceed the MAWP, as permitted by the original code of construction.

c) Verify nameplate capacity and, if possible, compare to system capacity requirements.

d) Check identification on seals and ensure they match nameplates or other identification (repair or reset nameplate) on the valve or device.

3.2.2 INSPECTION REQUIREMENTS FOR DEVICE CONDITION

a) The valve or device shall be checked for evidence that it is leaking or not sealing properly. Evidence of leakage through pressure-relief valves may indicate that the system is being operated at a pressure that is too close to the valve's set pressure. (See Supplement 2 for guidance on the pressure differential between the pressure relief valve set pressure and system operating pressure.)

b) Seals for adjustments shall be intact and show no evidence of tampering.

c) Connecting bolting should be tight and all bolts intact.

d) The valve or device should be examined for deposits or material buildup.

e) The valve or device shall be checked for evidence of rust or corrosion.

f) The valve or device shall be checked for damaged or misapplied parts.

g) If a drain hole is visible, the valve or device should be checked to ensure it is not clogged with debris or deposits.

h) The valve or device shall be checked for test gags left in place after pressure testing of the unit.

i) Bellows valves shall be checked to ensure the bonnet vent is open or piped to a safe location. The vent shall not be plugged since this will cause the valve set pressure to be high if the bellows develops a leak. Leakage noted from the vent indicates the bellows is damaged and will no longer protect the valve from the effects of back pressure.

(21) **3.2.3**

j) Valves that are not in services with known clean dry fluids, and are not welded to the system shall be removed for inspection of the interior of the inlet and outlet for deposits, clogging or corrosion. Previous documented inspections where the valve was removed demonstrating a clean system with no inlet or outlet interior concerns may be used to eliminate this inspection.

a) Ens

b) Inle
For pressure relief valves, the inlet pipe shall be checked to ensure the inlet pipe size is not smaller than the device inlet size.

c) Discharge piping shall be inspected to ensure it meets the original code of construction. For pressure relief valves, the discharge pipe shall be checked to ensure the discharge pipe size is not smaller than the device outlet size.

d) The valve drain piping shall be checked to ensure the piping is open.

e) The discharge piping shall be checked to ensure it drains properly.

f) The inlet and discharge piping shall be checked to ensure they are not binding or placing excessive stress on the valve body, which can lead to distortion of the valve body and leakage or malfunction.

g) The condition and adequacy of the pipe supports shall be inspected. Discharge piping should be supported independent of the device itself.

h) The valve discharge and discharge pipe shall be checked for possible hazards to personnel.

i) The installation shall be checked to ensure that there are no intervening isolation valves between the pressure source and the valve inlet or between the valve outlet and its point of discharge. Isolation valves may be permitted in some pressure vessel service. (See 2.5.6 e)), and Jurisdictional requirements. Isolation valves shall not be used for power boilers, heating boilers, or water heaters.

j) A ch
for t

Isolation valves shall be used only for removal of the pressure relief valve for inspection and testing on a test stand. The test stand shall meet the requirements of NBIC Part 4, par. 4.6.1 b)1) and 2).

is arranged such that there is no intermediate position that will isolate both pressure relief devices from the protected system. Change-over valves should be carefully evaluated to ensure they do not have excessive pressure drop that could affect the pressure relief device operation or capacity. These devices are commonly used in pressure vessel service. They may also be used in some boiler applications. It is recommended that the Jurisdiction be contacted to determine their acceptability on boiler applications.

3.2.4 ADDITIONAL INSPECTION REQUIREMENTS

The following are additional items that should be considered for the specified types of installations or services.

3.2.4.1 POWER BOILERS

If boilers are piped together with maximum allowable working pressures differing by more than 6%, additional protective devices may be required on the lower pressure units to protect them from overpressure from the higher pressure unit.

3.2.4.2 HOT-WATER HEATING BOILERS, HOT WATER SUPPLY BOILERS, AND WATER HEATERS

a) These units generally do not use any water treatment and therefore may be more prone to problems with deposits forming that may impair a safety device's operation. Particular attention should be paid to signs of leakage through valves or buildups of deposits.

b) Hot-water boilers tend to have buildups of corrosion products since the system is closed with little makeup. These products can foul or block the valve inlet.

c) Water heaters will have cleaner water due to continuous makeup. However, these valves usually have a thermal element that will cause the valve to open slightly when the water is heated and the heat is not removed from the system. When this hot water evaporates in the discharge piping, scale deposits may tend to form in the valve inlet and outlet.

3.2.4.3 PRESSURE VESSELS AND PIPING

Standard practice for overpressure protection devices is to not permit any type of isolation valve either before or after the device. However, some pressure vessel standards permit isolation valves under certain controlled conditions when shutting down the vessel to repair a damaged or leaking valve. If isolation block valves are employed, their use should be carefully controlled by written procedures. Block valves should have provisions to be either car-sealed or locked in an open position when not being used. For ASME Section VIII, Div. 1 pressure vessels, see UG-135, Appendix M, and Jurisdictional rules for more information.

3.2.4.4 RUPTURE DISKS

a) Rupture disks or other non-reclosing devices may be used as sole relieving devices or in combination with pressure relief valves to protect pressure vessels.

b) The selection of the correct rupture disk device for the intended service is critical to obtaining acceptable disk performance. Different disk designs are intended for constant pressure, varying pressure, or pulsating pressure. Some designs include features that make them suitable for back pressure and/or internal vacuum in the pressure vessel.

c) The margin between the operating pressure and the burst pressure is an important factor in obtaining acceptable performance and service life of the disk. Flat and prebulged solid metal disks are typically

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S6.3 NUCLEAR SAFETY RELATED VALVE GROUPS

These rules classify nuclear safety related pressure relief valves into three groups based upon the original code of construction and capacity certification status.

Group 1: ASME ~~Section I and Section VIII~~V and UV designated pressure relief valves accepted by the Jurisdiction for use in nuclear safety related service with National Board capacity certification.

Group 2: ASME Section III "NV" stamped Class 1, 2, or 3 pressure relief valves with National Board capacity certification.

Group 3: Pressure relief valves not addressed in Group 1 or Group 2. This group shall include pressure relief valves without National Board capacity certification and/or pressure relief valves constructed to codes or standards other than ASME (see NBIC Part 3, Category 3).

The term pressure relief valve includes power actuated pressure relief valves. Replacement of rupture disks in rupture disk holders or in systems is not considered a repair activity under the scope of this supplement.

S6.5 GENERAL RULES

e) When an ASME “V”, “UV” or “NV” ~~stamped~~ designated pressure relief device requires a duplicate nameplate because the original nameplate is illegible or missing, it may be applied using the procedures of NBIC Part 4, 4.7.4 provided concurrence is obtained from the Authorized Nuclear Inspector and Jurisdiction. In this case the nameplate shall be marked “~~SEC. I~~V”, “~~SEC. III~~NV”, or “~~SEC. VIII~~UV” to indicate original ASME Code stamping or designator.

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4.6.2 OWNER-USER ~~ASME CODE SECTION VIII STEAM~~ TESTING OF UV-DESIGNATED STEAM VALVES

When ASME ~~Code Section VIII~~ UV-Designated valves are repaired by the owner for the owner's own use, valves for steam service may be tested on air for set pressure and, if possible, blowdown adjustment, provided the valve manufacturer's corrections for differential in set pressure between steam and air are applied to determine the test pressure as follows:

Staff editorial note: Table of Contents will need to be updated