Date Distributed: 9/9/2024

THE NATIONAL BOARD
OF BOILER AND PRESSURE VESSEL INSPECTORS

NATIONAL BOARD INSPECTION CODE SUBCOMMITTEE PRESSURE RELIEF DEVICES

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MINUTES

Meeting of July 17th, 2024
Louisville, KY

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

Chair Adam Renaldo called the meeting to order at 8:07 a.m. Eastern Time. Members and guests in attendance can be found on attachment page 1.

2. Announcements

- This meeting marks the end of Cycle D for the 2025 NBIC edition. This meeting marks the end of the 2025 NBIC development cycle and is the last opportunity for code revisions to be approved for the 2025 NBIC.
- The National Board will be hosting a reception on Wednesday evening from 5:30 p.m. to 7:30 p.m. at the Rooftop Garden on the 16th floor of the hotel.
- The National Board will be hosting breakfast and lunch on Thursday in Citation A/B for those attending the Main Committee meeting. Breakfast will be served from 7:00 a.m. to 8:00 a.m. and lunch will be served from 11:30 a.m. to 12:30 p.m.
- Meeting schedules, meeting room layouts, and other helpful information can be found on the National Board website under the **NBIC** tab → NBIC Meeting Information.
- Remember to add any attachments that you'd like to show during the meeting (proposals, reference documents, power points, etc.) to the NBIC file share site (nbfileshare.org) **prior to the meeting**.
    - Note that access to the NBIC file share site is limited to committee members only.
    - ALL power point attachments/presentations must be sent to the NBIC Secretary prior to the meeting for approval.
    - Contact Jonathan Ellis (*nbicsecretary@nbbi.org*) for any questions regarding NBIC file share access.
- When possible, please submit proposals in Word format showing "strike through/underline". Project Managers: please ensure any proposals containing text from the 2021 NBIC are updated to contain text from the 2023 NBIC.
- If you'd like to request a new Interpretation or Action item, this should be done on the National Board Business Center.
    - Anyone, member or not, can request a new item.
- As a reminder, anyone who would like to become a member of a group or committee:
    - Should attend at least two meetings prior to being put on the agenda for membership consideration. The nominee will be on the agenda for voting during their third meeting.
    - The nominee must submit the formal request along with their resume to the NBIC Secretary **PRIOR TO** the meeting. *nbicsecretary@nbbi.org*
    - If needed, we can also create a ballot for voting on a new member between meetings.
- Thank you to everyone who registered online for this meeting. The online registration is very helpful for planning our reception, meals, room set up, etc. Please continue to use the online registration for each meeting. It is also a good way to make sure we have the most up-to-date contact information.
- Volunteers are requested to develop NBIC rules for Metrification and Rounding practices.
- Volunteers are requested to review old interpretations.

3. Adoption of the Agenda

A motion was made to adopt the amended agenda. The motion was seconded and approved unanimously

4. Approval of Minutes from the January 10, 2024, Meeting

A motion was made to approve the minutes from the January 10, 2024 meeting. The motion was seconded and approved unanimously.

5. **Review of the Roster**

   a. **Nominations**

      i. Mr. Darris Mosley is interested in becoming a member of Subgroup PRD. Mr. Mosley's membership was recommended by SG PRD.

      A motion was made to confirm Mr. Mosley's membership to SG PRD. The motion was seconded and approved unanimously.

      ii. Mr. Clark Turner is interested in becoming a member of Subgroup PRD. Mr. Turner's membership was recommended by SG PRD.

      A motion was made to confirm Mr. Turner's membership to SG PRD. The motion was seconded and approved unanimously.

      iii. Mr. Dave Sullivan is interested in becoming a member of Subcommittee PRD, representing AIAs.

      A motion was made to recommend Mr. Sullivan for membership on SC PRD. The motion was seconded and approved unanimously.

      iv. Mr. Henry Cornett is interested in becoming a member of Subcommittee PRD, representing Manufacturers.

      A motion was made to recommend Mr. Cornett for membership to Subcommittee PRD. The motion was seconded and approved unanimously.

   b. **Reappointments**

   c. **Officer Nominations**

   d. **Resignations**

6. Interpretation Requests

Item Number: 24-38	NBIC Location: Part 4, 2.5.4.2 & Part 1, 3.9.1.6 c)	No Attachment

General Description: T&P relief device installation on modular HWH supply header

Task Group: None assigned.

Explanation of Need: The NBIC does not address the installation or location of a common T&P valve for modular HWH's. Clarification is needed on whether the common supply header can be considered part of the HWH, and whether T&P valves can be installed in the horizontal position with the outlet pointed down, if installed directly to the header with no more than 4 in. maximum interconnecting piping.

July 2024 Meeting Action: The proposed question was revised. A motion was made to accept the revised question and reply. The motion was seconded and approved unanimously by SG and SC PRD, however, SG and SC Installation stated that modular HWHs are not currently addressed by NBIC and opened action item A24-26. This item cannot move forward until A24-26 is approved.

Item Number: 24-46	NBIC Location: Part 4, 4.3.1 a)	No Attachment

General Description: Replacement of Bodies and Transfer of Nameplates During Repair

Task Group: None assigned.

Explanation of Need: Clarity on what defines "the valve". Is "the valve" the nameplate solely or the nameplate and serialized base; and subsequent ability to divorce the nameplate and base during repair when the base requires replacement.

July 2024 Meeting Action: A proposed question and response was presented. This is an intent interpretation. Item 24-72 was opened in response to this interpretation request and a task group was assigned. This cannot move forward until Item 24-72 is approved.

7. Action Items

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

General Description: Create Guidelines to address Overpressure Protection by System Design.

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

July 2024 Meeting Action: Progress report. Work continues on this item.

Item Number: NB15-0307	NBIC Location: Part 4	Attachment Page 13-62

General Description: Create Guidelines for Repair of Pin Devices.

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

July 2024 Meeting Action: A proposal was presented. A motion was made to approve the proposal following revisions. The motion was seconded and approved unanimously.

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, K. Beise

July 2024 Meeting Action: Progress report. Work continues on this item.

Item Number: 19-83	NBIC Location: Part 4, Part 1	No Attachment

General Description: Address alternate pressure relief valve mounting permitted by ASME CC2887-1.

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

July 2024 Meeting Action: Progress report. Work continues 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), H. Cornett, B. Nutter, K. Beise, J. Grace

Explanation of Need: The recently approved S4.4, "Weight Loaded Vents," (NB12-0901) 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 2024 Meeting Action: Progress report. Work continues on this item.

Item Number: 21-62	NBIC Location: Part 4, 4.8.5.4 i) 3)	Attachment Page 63

General Description: Verification of existing spring during repair activities

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

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 2024 Meeting Action: A proposal for this item was sent to letter ballot for SG and SC PRD between meetings and passed SG PRD. The proposal was presented to the subcommittee for a voice vote. A motion was made to accept the proposal and received 7 approval votes, 4 negative votes (B. Nutter, A. Donaldson, A. Renaldo, N. Bailey), and 2 abstentions (D. Schirmer, D. Marek). A motion was made to close this item with no action. The motion was seconded and approved with majority vote. (3 negative votes: D. McHugh, T. Tarbay, D. Marek) (Not Voting: E. Creaser). Reasons for negative votes and abstentions can be found in the attachments.

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	Attachment Page 64

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

Subgroup: PRD

Task Group: D. Marek (PM), J. Ball, J. Wolf, 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 2024 Meeting Action: A proposal was presented. A motion was made to approve the proposal. The motion was seconded and approved unanimously.

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

General Description: Add language to NBIC Part 4 for valves manufactured to Code Case 2787

Subgroup: PRD

Task Group: A. Donaldson (PM), H. Cornett, 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 2024 Meeting Action: Progress report. Work continues on this item.

Item Number: 22-20	NBIC Location: Part 4, 4.7.4	No Attachment

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 2024 Meeting Action: Progress report. Work continues on this item.

Item Number: 23-32	NBIC Location: Part 4, 3.3 and Supp. 6	No Attachment

General Description: Rules for T/O activities related to Nuclear Class Valves

Subgroup: PRD

Task Group: E. Creaser (PM), P. Dhobi, D. McHugh, J. Simms

Explanation of Need: Nuclear facilities that perform repair and T/O activities would by allowing them to use T/O for nuclear class valves that were serviced but not in need of repair but need to be set and sealed again.

July 2024 Meeting Action: Progress report. Work continues on this item.

8. New Business

Item Number: 24-35	NBIC Location: Part 4, 4.6.2	No Attachment

General Description: Update Testing of UV-Designated Steam valves on Air to match ASME XIII

Subgroup: PRD

Task Group: T. Beirne (PM)

Explanation of Need: ASME Section XIII Table 3.6.3.1-1 Note 3 permits UV-designated steam valves to be tested using air when the valve is beyond the testing capabilities due to set pressure or capacity. The NBIC only permits steam valves to be tested on air by the owner/user. This should be permitted by any VR shop that has steam test equipment since it is permitted under the rules for new construction.

July 2024 Meeting Action: A proposal will go to letter ballot.

Item Number: 24-49	NBIC Location: Part 4, 4.7.3	Attachment Page 65

General Description: Add words regarding maintaining converted PRV Type/Model Number

Subgroup: PRD

Task Group: None assigned.

Explanation of Need: When a conversion is performed, the Type/Model Number as converted is recorded on the VR Repair Nameplate. However, there is no requirement to indicate the Type/Model Number on the VR Nameplate during subsequent VR Repairs. This can result in losing track of the Type/Model Number as converted.

July 2024 Meeting Action: A proposal was presented. Subgroup felt this was already addressed in another paragraph. Subgroup recommended closing with no action. A motion was made to confirm closing with no action. The motion was seconded and approved with one opposed (N. Bailey). This item will be closed with no action.

Item Number: 24-63	NBIC Location: Part 4, Table 3.2.6 and Part 2, Table 2.5.8	Attachment Page 66

General Description: Change to Note on Tables Regarding Replacement of T&P Valves

Subgroup: PRD

Task Group: None assigned.

Explanation of Need: Reword for clarity, and to remove references to cost of repair.

July 2024 Meeting Action: A proposal was presented. A motion was made to accept the proposal. The motion was seconded and approved unanimously.

Item Number: 24-64	NBIC Location: Part 4, 2.5.3 d) and Part 1, 3.9.3 d)	Attachment Page 67-68

General Description: PRV Set Pressure Requirements for HW Heating & Supply Boilers

Subgroup: PRD

Task Group: None assigned.

Explanation of Need: The current NBIC set pressure/capacity requirements for PRVs on HW heating and supply boilers are not consistent with the requirements in ASME Section IV.

July 2024 Meeting Action: A proposal was presented. A motion was made to accept the proposal. The motion was seconded and approved unanimously.

Item Number: 24-66	NBIC Location: Part 4, 2.5.1.5	Attachment Page 69-70

General Description: Align Part 4, 2.5.1.5 with changes made in Part 1 Item 22-30

Subgroup: PRD

Task Group: None assigned.

Explanation of Need: Part 1's Item 22-30 passed MC in July 2023. Part of the item added paragraph f) to 3.9.1.5. But the same change was never posed for the parallel Part 4 section (2.5.1.5) and should have been.

July 2024 Meeting Action: A proposal was presented. After discussion, the subgroup felt that the proposed change was outside the purview of NBIC, and that safe discharge is already covered. Following discussion, the subgroup recommended rejecting the proposal and closing this item with no action. A motion was made to confirm the Subgroup's recommendation. The motion was seconded and was approved unanimously.

Item Number: 24-72	NBIC Location: Part 4, 4.3.1	No Attachment

General Description: Add language to Address Replacement of Valve Components Which Bear the Original Code of Construction Marking.

Subgroup: PRD

Task Group: A. Donalson (PM), G. Salwan, E. Creaser, H. Cornett, B. Nutter, P. Dhobi, T. Tarbay., T. Patel

Explanation of Need: Under the current text of 4.3.1 there are no guidelines for the replacement of valve components to which the original nameplate is attached or that bear the original code of construction marking.

Background Information: As part of discussions regarding an interpretation request (I24-38), it was determined that an action item needed to be opened and a task group formed to add language to address the replacement of valve components.

July 2024 Meeting Action: A task group was formed.

9. Presentations

10. Future Meetings

- July 15-18, 2024 – The Brown Hotel in Louisville, KY
- January 13-16, 2025 – Charleston, SC

11. Adjournment

A motion was made to adjourn the meeting. The motion was seconded and approved unanimously. The meeting adjourned at 11:50 AM EDT.

Respectfully Submitted,

Robert Viers
Secretary, Subgroup Pressure Relief Devices

Subcommittee PRD Attendees - July 2024

MEMBERS:	Interest Category	Registered For	In Person	Remote	Not In Attendance
Adam Renaldo	Users	In Person	x		
Jay Simms	Manufacturers	In Person			x
Robert Viers	Secretary	In Person	x		
Kim Beise	National Board Certificate Holders	In Person			x
Eben Creaser	Jurisdictional Authorities	Remote		x	
Prakash Dhobi	National Board Certificate Holders	In Person	x		
Alfred Donaldson	Manufacturers	In Person		x	
David McHugh	General Interest	In Person	x		
Brandon Nutter	National Board Certificate Holders	Remote		x	
Thakor Patel	Manufacturers	NR		x	
Delton Schirmer	Authorized Inspection Agencies	In Person	x		
Thomas Tarbay	General Interest	In Person	x		
Nick Bailey*	General Interest	In Person	x		
Dennis DeMichael	General Interest	NR			x
Daniel Marek	Users	Remote		x	
Jon Wolf	Authorized Inspection Agencies	In Person	x		

*Representing Alton Cox

VISITORS:	Company/Title/Interest	Registered For	In Person	Remote
Darris Mosley	Occidental Petroleum	Remote		x
Luis Ponce	National Board of Boiler & Pressure Vessel Inspectors	In Person	x	
Clark Turner	Calder	In Person		x
Henry Cornett	Emerson Automation Solutions US LP	In Person	x	
Jeremy Grace	Chemours	Remote		x
Gary Scribner	National Board of Boiler & Pressure Vessel Inspectors	In Person	x	
Ray Ceccarelli	FM Global	In Person	x	
Erik Heck	ARI-Armaturen	In Person	x	
Billy DeKeyzer	Trillium Flow Control	In Person	x	
Junior Little	Cross Company	In Person	x	
Gabe Salwan	Quality Valve	In Person	x	
Dave Sullivan	XL Insurance	Remote		x
Scott Artrip	Cross Company	In Person	x	
Rob Stimson				x
John Mirjalali				x

From: Del Schirmer
To: Bob Viers
Subject: 21-62 Abstention
Date: Wednesday, July 17, 2024 10:55:08 AM

Bob,
I am in abstention on the vote of 21-62 because I feel that I don't have enough knowledge on this subject.

Be Safe,

Del Schirmer
Central Region Supervisor

Boiler & Property Consulting | XL Insurance America, Inc.
5018 Bristol Industrial Way, Suite 203, Buford, Georgia 30518
Direct: 651-666-9824 | Home Office: 770-614-3111
Email: Del.Schirmer@BoilerProperty.com
www.BoilerProperty.com

From: Marek, Daniel T. (GRC-FDS0)[MAINTHIA TECHNOLOGIES]
To: Bob Viers
Subject: Task 21-62 Abstain
Date: Wednesday, July 17, 2024 11:15:55 AM

I abstained from voting on Task 21-62 as I have heard the arguments for and against yet could not come to a decision. I have limited knowledge on this topic and based upon discussions I agree with the arguments of both sides. I concluded that the views on this topic depends on your what role you are in, repair shops want to get the job done, manufacturer's want to protect their intellectual knowledge and steer VR tasks to their approved vendors, while the Jurisdiction may not have adequate information to make the decision on waivers and is put in a difficult situation.

Daniel T. Marek

Senior Pressure Systems Engineer

Mainthia Technologies Inc.
NASA Glenn Research Center
Pressure Systems Office (PSO)
21000 Brookpark Rd., M.S. 5-5
Cleveland, Ohio 44135
Phone # (216) 433-5494

Plan for the best... Prepare for the worst...

From: Adam Renaldo
To: Bob Viers
Subject: reason for voting against 21-62
Date: Wednesday, July 17, 2024 12:12:24 PM

We should not have the Jurisdiction managing the VR program. If we feel there is a need for an exception, we should establish rules within the VR program to handle it.

Adam Renaldo, PE, PMP
Senior Customer Service Engineer
Linde
Phone: 716-879-2928
**Note that my email has changed. It is now Adam.Renaldo@linde.com

Making our world more productive

From: Donaldson, Alfred
To: Bob Viers
Subject: Vote Against 21-62
Date: Wednesday, July 17, 2024 11:03:14 AM

Bob,

Here are my comments on why I voted no.

Though I worked on this task group in an attempt to resolve the issue presented in the original inquiry, I cannot support this proposed change. The existing words of 4.8.5.4 i)3) were carefully selected to ensure the Manufacturer (the only entity who can evaluate whether a particular spring is suitable for use or not) must accept the use of any spring that is not the spring listed on the current spring chart. One of the tenants of the "VR" program is written above in 4.5.8.4 i) and states "Repair procedures shall require verification that the critical parts meet the valve manufacturer's specification." I believe this is one of the key reasons that so many Jurisdictions have chosen to make compliance with the NBIC "VR" program mandatory - the knowledge that a "VR" repaired PRV will meet the valve manufacturer's specifications and perform to the standards of a new valve. The changes proposed by this item erases that critical aspect for the spring (a critical component) and places its acceptance into the hands of a Jurisdictional resource who does not have the same knowledge and data as the valve manufacturer and who cannot ensure the spring meets the manufacturer's specification. As such, I believe the existing words in 4.8.5.4 i)3) accurately reflect the only exception that can or should be made relative to accepting springs that do not match the current spring chart. I suggest we keep the existing text and this item be closed with no action.

Alfred Donaldson
Global Training and Certification Leader
IET – Industrial Valves and Gears
Baker Hughes

M +1 832 360 7892

From: Nutter, Brandon K
To: Bob Viers
Cc: Adam Renaldo (Adam.Renaldo@linde.com)
Subject: Voting responses regarding NB Item 21-62
Date: Wednesday, July 17, 2024 11:17:47 AM
Attachments: image001.png
image002.png
image003.png

Bob,

On the vote to approve the proposed changes under 21-62, I voted “Disapproved” and reaffirmed my negative from the SC-PRD letter ballot:

> Though I worked on this task group in an attempt to resolve the issue presented in the original inquiry, I cannot support this proposed change. The existing words of 4.8.5.4 i)3) were carefully selected to ensure the Manufacturer (the only entity who can evaluate whether a particular spring is suitable for use or not) must accept the use of any spring that is not the spring listed on the current spring chart. One of the tenants of the "VR" program is written above in 4.5.8.4 i) and states "Repair procedures shall require verification that the critical parts meet the valve manufacturer's specification." I believe this is one of the key reasons that so many Jurisdictions have chosen to make compliance with the NBIC "VR" program mandatory - the knowledge that a "VR" repaired PRV will meet the valve manufacturer's specifications and perform to the standards of a new valve. The changes proposed by this item erases that critical aspect for the spring (a critical component) and places its acceptance into the hands of a Jurisdictional resource who does not have the same knowledge and data as the valve manufacturer and who cannot ensure the spring meets the manufacturer's specification. As such, I believe the existing words in 4.8.5.4 i)3) accurately reflect the only exception that can or should be made relative to accepting springs that do not match the current spring chart. I suggest we keep the existing text and this item be closed with no action.

On the vote that followed to close item 21-62 with no action, I voted “Approved” with no comment.

Best Regards,

Brandon K. Nutter
Corporate Competency Leader – Overpressure Protection
DuPont Engineering Technology Center

DUPONT

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Connect with us:

From: Nick Bailey
To: Bob Viers
Subject: Negative Vote Item 21-62
Date: Friday, July 26, 2024 4:01:02 PM
Attachments: Outlook-lzsmndqz.png

Bob,

I voted Negative on Item 21-62.

Local Jurisdiction already has the authority to allow the existing spring to be used without Manufacturer approval by not applying the VR stamp.
NBIC dictates the rules for application of the VR stamp.
This proposal if passed would be cause for questioning of all VR rules.
I also know that this would be misused by a lot of VR shops. Many VR shops have never consulted their local jurisdiction.

With gratitude,
Nick Bailey
M: 918-798-5712
nick@jaltoncox.com
JAC Consulting, Inc.

sender's contact information for direct marketing purposes or for transfers of data to third parties.

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From: Marek, Daniel T. (GRC-FDS0)[MAINTHIA TECHNOLOGIES]
To: Bob Viers
Subject: Task 21-62 Closing - No Vote
Date: Wednesday, July 17, 2024 11:19:08 AM

I voted no to the closing of Task 21-62 as I feel the topic was heated and consensus was not achieved. Several ideas come up in today's discussion which could have been incorporated as a compromise for both sides.

Daniel T. Marek

Senior Pressure Systems Engineer

Mainthia Technologies Inc.
NASA Glenn Research Center
Pressure Systems Office (PSO)
21000 Brookpark Rd., M.S. 5-5
Cleveland, Ohio 44135
Phone # (216) 433-5494

Plan for the best... Prepare for the worst...

From: David McHugh
To: Bob Viers
Subject: 21-62: Vote negative to close with no action
Date: Wednesday, July 17, 2024 11:21:01 AM

Years of work done on this item with PM and task group members voting against their own task work proposal and then vote to close with no action along with PM and task memebers working to convince other members to vote against the proposal. It seems the PM and task group work process broke down on this item.

From: Tom Tarbay
To: Bob Viers
Subject: Negative vote
Date: Wednesday, July 17, 2024 11:07:07 AM

Bob, the reason I voted negative on the action to close item 21-62 is because this request came from a chief inspector. I feel our committee has a responsibility to address issues that any chief inspector may have.

Thomas Tarbay
TRT Consultants
Email: trtarbay@yahoo.com
Cell: 614.353.0027

From: Nick Bailey
To: Bob Viers
Subject: Voted against closing Item 24-49
Date: Friday, July 26, 2024 4:23:31 PM
Attachments: Outlook-iykjvxx0.png

Bob,

I Voted against closing Item 24-49

In my opinion 4.7.3 does not require the Following VR holder to stamp the repair nameplate with the as converted information from the Previous conversion.

Although, I believe the intention of the NBIC Code is that the information as converted be carried forward, This is not what it says.
You would think it is common sense however many VR shops interpret 4.7.3 exactly as the last two sentences say.
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.

If or When you mark out information on the OEM Nameplate the VR Holder shall be indicated on the repair nameplate.
Code does not require the second or third VR holder to stamp their repair nameplate with the corrected information as converted.

With gratitude,
Nick Bailey
M: 918-798-5712
nick@jaltoncox.com
JAC Consulting, Inc.

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 accre

dited 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 (AIso Part 2, 2.5.4) 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 (Also Part 2, 2.5.7) 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 (Also Part 2, 2.5.8) 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 or 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.

4.21 "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 relief valves and pin devices.

   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 pin devices marked with the ASME Certification Mark and "UD" Designator, or the supplanted ASME "V", "UV", "UD"(for pin devices) "HV" or "NV" Code symbol and have been capacity certified or flow resistance 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 a pressure relief valve or pin device on a pressure vessel, are not considered a repair if made by the manufacturer or assembler of the valve ~~and~~or 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~~

or pin device manufacturer (such as packing list) from the pressure relief valve ~~and~~ or pin device ~~-~~manufacturer or assembler of the pressure relief valve ~~and~~ or 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~~or 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~~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 and pindevice parts 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~~ or pin device repair.

   1) Pressure relief valve ~~and~~ or ~~P~~pin ~~D~~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~~ or 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 AND 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 with the manufacturer's specified procedures and with the test media specified by the manufacturer and the appropriate ASME Code.

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

1) Pressure relief valve s~~S~~et pressure (as defined by the valve manufacturer and as listed in NB-18, *Pressure Relief Device Certifications). Pin device set pressure by a functional test using a Manufacturer's qualified pin.;*

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.

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 a seal on a pressure relief valve's ~~and~~ or pin device's ~~seals~~ to be replaced shall be identified by a nameplate as described in 4.7.2 or 4.7.4.

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

(19) **4.7.2 REPAIR NAMEPLATE**

When a pressure relief valve ~~and~~or 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 valve~~s~~ 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 or Certified Flow Resistance , Kr(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

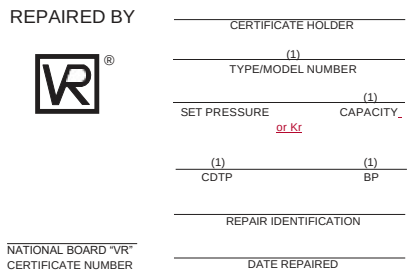
8) When an adjustment is made to correct for service conditions of superimposed back pressure and/or temperature or the differential between popping pressure between steam and air (see 4.6.2), the information on the valve repair nameplate shall include the:

a. Cold Differential Test Pressure (CDTP); and

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

FIGURE 4.7.2-a

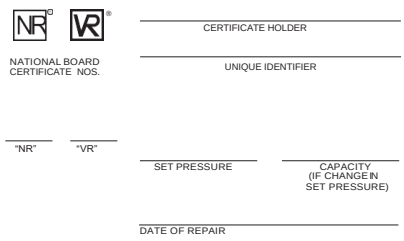
REQUIRED MARKINGS FOR REPAIR OF ASME/NATIONAL BOARD "V," "UV,", " UD" AND "HV"-STAMPED PRESSURE RELIEF VALVES **OR~~AND~~ PIN DEVICES**



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~~ OR 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.~~ Similarly, the certified flow resistance for pin device shall be updated if there is a 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, and~~or~~ users that make repairs to the ASME Code symbol stamped or marked pressure relief valves **and pin devices** and National Board capacity certified or flow resistance 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 of the 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 or flow resistance 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~~or 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/or pin devices. Repair procedures shall require verification that the critical parts meet the pressure relief valve~~s~~ ~~and~~or 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~~ or pin devices shall be accompanied by the document referred to above for processing through the plant. Each pressure relief valve~~s~~ ~~and~~or 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 trace- ability 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 valve~~s~~ and/or pin devices parts. The method of identifying each spring shall be indicated on the repair document described in **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/or 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 a part of a the pres- sure relief valves and or 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 pPin Ddevices 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 Ppin Ddevices 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 re-
quired 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 AND PIN DEVICES

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~~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.

Commented [AC5]: *Is this for a PIN Device?*

Commented [AC6]: *Is this for a PIN Device?*

c) Disassembly

1. Remove ~~Buckling~~ Pin Protective Cage(screen), if applicable

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

If moving freely install nut on the piston/plug and set aside for reinstalling the assembly back onto the valve body.

bonnet plug assembly

Commented [AC7]: manufacturer

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

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 required to be sealed by the original code of construction 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.

~~b.~~c. 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** l~~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.

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]:

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

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

breakage.

5) 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

i) Repair and Inspection Program

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

1) Each valve or group of valves shall be accompanied by the document referred to above for processing through the plant. Each valve shall have a unique identifier (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), fitup, NDE technique, heat treatment, and pressure test methods to be used. Application of the "VR" stamp to the repair nameplate shall be recorded in this document. Specific conversions performed with the new Type/Model number shall be recorded on the document. There shall be a space for "signoffs" at each operation to verify that each step has been properly performed.

3) The system shall include a method of controlling the repair or replacement of critical valve parts. The method of identifying each spring shall be indicated on the repair document described in 4.8.5.4 i). Such identification shall be based on the Manufacturer's spring chart current at the time of the repair with the following ~~,~~exceptions: ~~except that~~

   a. T~~t~~he 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.
   b. If the information required for verification is unavailable, the VR Certificate Holder may reinstall the existing spring with acceptance of the Jurisdiction
   ~~3)~~c. Such verification described in 4.8.5.4 i) 3) a. or justification and acceptance by the Jurisdiction described in 4.8.5.4 i) 3) b. ~~Such verification~~ shall be documented on the repair document described in 4.8.5.4 i).

Item 22-08: Review and improve guidance for T&P valve installation relating to probe.

Part 4
2.5.1.6 TEMPERATURE AND PRESSURE RELIEF VALVES
Hot-water heating or supply boilers limited to a water temperature of 210°F (99°C) may have one or more National Board capacity certified temperature and pressure relief valve(s) installed. The requirements of 2.5.1.1 through 2.5.1.5 shall be met, except as follows:
a) A Y-type fitting shall not be used.
b) If additional valves are used, they shall be temperature and pressure relief valves.
c) When the temperature and pressure relief valve is installed directly on the boiler with no more than 4 in. (100 mm) maximum interconnecting piping, the valve may be installed in the horizontal position with the outlet pointed down.
d) The location of relief valve mounting shall ensure that the relief valve's temperature probe is constantly submerged at or near the hot water outlet.

Part 1
3.9.1.6 TEMPERATURE AND PRESSURE RELIEF VALVES
Hot-water heating or supply boilers limited to a water temperature of 210°F (99°C) may have one or more National Board capacity certified temperature and pressure relief valve(s) installed. The requirements of ~~NBIC Part 1,~~ 3.9.1.1 through 3.9.1.5 shall be met, except as follows:
a) A Y-type fitting shall not be used.
b) If additional valves are used, they shall be temperature and pressure relief valves.
c) When the temperature and pressure relief valve is installed directly on the boiler with no more than 4 in. (100 mm) maximum interconnecting piping, the valve may be installed in the horizontal position with the outlet pointed down.
d) The location of relief valve mounting shall ensure that the relief valve's temperature probe is constantly submerged at or near the hot water outlet.

NBIC Part 4, 4.7.3

4.7.3 CHANGES TO ORIGINAL PRESSURE RELIEF VALVE NAMEPLATE INFORMATION

a) Information on the original nameplate or stamping, such as but not limited to set pressure, capacity, blowdown, or type/model number may no longer be valid following certain repair activities. For these repairs, the invalidated information on the original nameplate or stamping shall be marked out but left legible. Any changes to capacity shall be based on that for which the valve was originally certified, or if a conversion has been made, as described in 4.2, on the capacity certification for the valve as converted.

~~a)~~b) When a conversion has previously been performed, the Type/Model Number as converted shall be recorded on the current repair documentation and repair nameplate such that traceability is maintained.

~~b)~~c) 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.

Part 4, Table 3.2.6

Note 3:

The temperature probe shall be checked for the condition of the coating material and freedom of movement without the probe becoming detached~~ing~~. If the valve is damaged or fails the testing described in Table 3.2.6, above, it ~~probe pulls out or falls off during inspection, the valve~~ shall be repaired or replaced. ~~Due to the relatively low cost of temperature and pressure relief valves for this service~~valve's design~~, it is recommended that a defective valve be replaced~~ instead of repaired ~~with a new valve if a repair or resetting is indicated.~~

Part 2, Table 2.5.8

Note 3:

The temperature probe shall be checked ~~(without detaching it)~~ for the condition of the coating material and freedom of movement without the probe becoming detached~~ing~~. If the valve is damaged or fails the testing described in Table 2.5.8, above, it ~~probe pulls out or falls off during inspection, the valve~~ shall be repaired or replaced. ~~Due to the relatively low cost of temperature and pressure relief valves for this service~~valve's design~~, it is recommended that a defective valve be replaced~~ instead of repaired ~~with a new valve if a repair or resetting is indicated.~~

NBIC Part 1, 3.9.3 & Part 4, 2.5.3

Part 1, 3.9.3

a) Pressure relief valves shall be manufactured in accordance with a national or international standard and be certified for capacity by the National Board.
b) Each hot-water heating or hot-water supply boiler shall have at least one National Board capacity certified pressure relief valve~~,~~ of the automatic reseating type. Each pressure relief valve shall be set to relieve at or below the maximum allowable working pressure of the boiler.
c) Hot-water heating or hot-water supply boilers limited to a water temperature not in excess of 210°F (99° C) may have, in lieu of the valve(s) specified in b) above, one or more National Board capacity certified temperature and pressure relief valves of the automatic reseating type. Each temperature and pressure relief valve shall be set to relieve at or below the maximum allowable working pressure of the boiler.
~~d) When more than one pressure relief valve is used on either hot-water heating or hot water supply boilers, the additional valves shall be National Board capacity certified and may have a set pressure within a range not to exceed 6 psig (40 kPa) above the maximum allowable working pressure of the boiler up to and including 60 psig (414 kPa), and 5% for those having a maximum allowable working pressure exceeding 60 psig (414 kPa).~~
~~e)~~d) No pressure relief valve shall be smaller than NPS 3/4 (DN 20) nor larger than NPS 4 (DN 100), except that boilers having a heat input not greater than 15,000 Btu/hr (4.4 kW) should be equipped with a rated pressure relief valve of NPS 1/2 (DN 15).
~~f)~~e) The required relieving capacity, in lbs/hr (kg/hr), of the pressure relief valve(s) on a boiler shall be the greater of that determined by dividing the maximum output in Btu/hr (W) at the boiler nozzle obtained by the firing of any fuel for which the unit is installed by 1,000 Btu//hr/lb (645 W/kg), or shall be determined on the basis of lbs steam/hr/ft$_2$ (kg steam/hr/m$_2$) as given in Table 2.2.4. For cast-iron boilers, the minimum valve capacity shall be determined by the maximum output method. In many cases a greater relieving capacity of valves will have to be provided than the minimum specified by these rules. In every case, the requirements of ~~NBIC Part 1,~~ 3.9.3 g~~h~~) shall be met.
~~g)~~f) When operating conditions are changed, or additional boiler heating surface is installed, the valve capacity shall be increased, if necessary, to meet the new conditions and be in accordance with 3.9.3 g~~h~~). The additional valves required, on account of changed conditions, may be installed on the outlet piping provided there is no intervening valve.
~~h)~~g) Pressure relief valve capacity for each boiler with a single pressure relief valve shall be such that, with the fuel burning equipment installed and operated at maximum capacity, the pressure cannot rise more than 10% above the maximum allowable working pressure. When more than one pressure relief valve is used, the over pressure shall be limited to 10% above the set pressure of the highest set valve allowed by ~~Part 1,~~ 3.9.3 ~~d)~~b) or c).

REFERENCE

Part 4, 2.5.3 PRESSURE RELIEF VALVE REQUIREMENTS FOR HOT WATER HEATING OR HOT WATER SUPPLY BOILERS

a) Pressure relief valves shall be manufactured in accordance with a national or international standard and be certified for capacity by the National Board.
b) Each hot-water heating or hot-water supply boiler shall have at least one National Board capacity certified pressure relief valve~~,~~ of the automatic reseating type. Each pressure relief valve shall be set to relieve at or below the maximum allowable working pressure of the boiler.

c) Hot-water heating or hot-water supply boilers limited to a water temperature not in excess of 210°F (99° C) may have, in lieu of the valve(s) specified in (b) above, one or more National Board capacity certified temperature and pressure relief valves of the automatic reseating type. Each temperature and pressure relief valve shall be set to relieve at or below the maximum allowable working pressure of the boiler.

~~d) When more than one pressure relief valve is used on either hot-water heating or hot water supply boilers, the additional valves shall be National Board capacity certified and may have a set pressure within a range not to exceed 6 psig (40 kPa) above the maximum allowable working pressure of the boiler up to and including 60 psig (414 kPa), and 5% for those having a maximum allowable working pressure exceeding 60 psig (414 kPa).~~

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~~f)~~e) The required relieving capacity, in lbs/hr (kg/hr), of the pressure relief valve(s) on a boiler shall be the greater of that determined by dividing the maximum output in Btu/hr (W) at the boiler nozzle obtained by the firing of any fuel for which the unit is installed by 1,000 Btu//hr/lb (645 W/kg), or shall be determined on the basis of lbs steam/hr/ft_2 (kg steam/hr/m_2) as given in Table 2.2.4. For cast-iron boilers, the minimum valve capacity shall be determined by the maximum output method. In many cases a greater relieving capacity of valves will have to be provided than the minimum specified by these rules. In every case, the requirements of 2.5.3 g~~h~~) shall be met.

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Part 4

2.5.1.5 PRESSURE RELIEF VALVE DISCHARGE PIPING

a) A discharge pipe shall be used. Its internal cross-sectional area shall be ~~not less~~greater than the full area of the valve outlet or ~~of the~~ total of the valve outlets that discharge into ~~the~~ a common pipe;~~, and~~ the discharge pipe shall furthermore be as short and straight as possible and arranged and supported in a way that does not add ~~as to avoid~~ undue stress to ~~on~~ the valve or valves. A union may be installed in the discharge piping close to the valve outlet. When an elbow is placed on a pressure relief valve discharge pipe, it shall be located close to the valve outlet, downstream of the union to minimize reaction moment stress.

b) The discharge from pressure relief valves shall be ~~so~~ arranged in a way that ~~there will be~~poses no danger of scalding ~~attendants~~. The pressure relief valve discharge shall be piped away from the boiler to a safe point of discharge, and provisions for proper drainage of the piping~~there~~ shall be ~~provisions~~ made ~~for properly draining the piping~~. The size and arrangement of discharge piping shall ~~be such~~ensure that any pressure that may exist or develop will not reduce the relieving devices' relieving capacity ~~of the relieving devices~~ below that required to protect the boiler.

c) Discharge piping shall be rated for the discharge fluid conditions of pressure and temperature including a minimum and maximum design temperature. Material selection for the discharge piping shall consider the reduction in material toughness at the low end of design temperature and the reduction in material strength at the high end of design temperature. Rigid pipe or tubing should be used for discharge lines that carry hot water or steam.

d) Plastic discharge pipe and fittings are permitted (when compatible with the process fluid, system design temperatures, and other ambient conditions such as light and humidity) and shall conform to NSF/ANSI 14 – *Plastics Piping System Components and Related Materials*.

e) Discharge piping shall be rated for any static pressure present and ~~the~~ back pressure that may develop when the pressure relief device is at full capacity. Where multiple pressure relief devices or vents discharge into common piping, the back pressure that could develop due to simultaneous flow from all sources shall be considered.

~~e)~~f) For hot-water boilers with potentially hazardous fluids, such as ethylene glycol, discharge to drains should consider any environmental requirements.

Commented [BV1]: Not editorial - keep original wording

Commented [BV2R1]: "furthermore" not needed

Commented [BV3]: Remove "and supported"

Commented [MV4]: This text approved only for Part 1 by MC- July 2023 (Part 1 item 22-30)

Part 1

3.9.1.5 PRESSURE RELIEF VALVE DISCHARGE PIPING

a) A discharge pipe shall be used. Its internal cross-sectional area shall be ~~not less~~greater than the full area of the valve outlet or ~~of the~~ total of the valve outlets ~~discharging thereinto, and~~that discharge into a common pipe; the discharge pipe shall furthermore be as short and straight as possible and arranged and supported in a way that does not add~~as to avoid~~ undue stress ~~on~~ to the valve or valves. A union may be installed in the

discharge piping close to the valve outlet. When an elbow is placed on a pressure relief valve discharge pipe, it shall be located close to the valve outlet, downstream of the union to minimize reaction moment stress.

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f) For hot-water boilers with potentially hazardous fluids, such as ethylene glycol, discharge to drains should consider any environmental requirements.

~~e)~~

Commented [MV5]: This text approved for Part 1 by MC- July 2023 (Part 1 item 22-30)