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**THE
NATIONAL
BOARD**
OF BOILER AND
PRESSURE VESSEL
INSPECTORS

**NATIONAL BOARD
SUBCOMMITTEE
PRESSURE RELIEF DEVICES**

MINUTES

Meeting of July 20, 2016
Columbus, OH

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The National Board of Boiler & Pressure Vessel Inspectors
1055 Crupper Avenue
Columbus, Ohio 43229-1183
Phone: (614)888-8320
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1. Call to Order

The meeting was called to order at 8:00 AM on Wednesday July 20, 2016 by Chairman Sid Cammeresi.

The following members and visitors were in attendance:

Members

Marriane Brodeur
Kevin Simmons
Brandon Nutter
Sid Cammeresi (Chair)
Adam Renaldo
Denis DeMichael
Dan Marek
Thakor Patel
R.W. Donalson
Thomas P. Beirne, P.E.

Affiliation

International Valve & Instrument Corp.
Pentair Valves and Controls
DuPont
Furmanite America
Praxair
The Chemours Company
Mainthia Technologies
Farris Engineering
Pentair Valves and Controls
National Board (Subcommittee Secretary)

Members Not Present

David McHugh
Raymond McCaffrey
J. Alton Cox
Kim Beise

Allied Valve, Inc.
Quality Valve, Inc.
JAC Consulting, Inc.
Dowco Valve

Visitors

Tom Tarbay
Jeff Castle
Mark Sherwood
Junior Little
Scott Artrip
Joseph Ball
Steve Irvin*
Kristen Kraabel **

TRT Consultants
Zurich
Eastman Chemical
Eastman Chemical
Eastman Chemical
National Board
JAC Consulting
Dowco Valve

*Alternate for J. Alton Cox

**Alternate for Kim Beise

2. Announcements

Mr. Cammeresi announced the reception for Wednesday and meals provided.

3. Adoption of the Agenda

The agenda dated June 27, 2016 was presented with the addition of items NB16-0809A, NB16-0401, NB15-0108, and NB16-0805. It was moved and seconded to approve the agenda with the additional items. The motion was unanimously approved.

4. Approval of Minutes of January 13, 2016

It was moved and seconded to approve the minutes of the January 2016 meeting of the Subcommittee on Pressure Relief Devices. The motion was unanimously approved with Mr. DeMichael Abstaining since he was not present at the January meeting.

5. Review of the Roster

a. Nominations

- Bryce Hart would like to become a member of SC Pressure Relief Devices. A vote of support was taken and was unanimous in favor of Bryce Hart joining SC Pressure Relief Devices. His appointment is on the Main Committee agenda for action.

b. Reappointments

- Mr. Kevin Simmons is eligible for reappointment to the Subcommittee on Pressure Relief Devices. He would like to continue his membership. A vote of support was taken and unanimous in favor with the exception of Mr. Donalson Not Voting due to conflict of interest. This membership item is included on the main committee agenda for action.

c. Resignations

- None

6. Interpretations

Item Number: IN16-0301	NBIC Location: Part 4	None
General Description: Temperature listed on pressure relief valve nameplate		
Subgroup: N/A		
Task Group: None Assigned		
Meeting Action: Interpretation request was for ASME paragraph. Committee cannot provide interpretation for another standard.		

7. Action Items

Item Number: NB12-0901	NBIC Location: Part 3	No Attachment
General Description: Prepare a guide for repair of tank vents		
Task Group: D. DeMichael (PM), K. Simmons, B. Donalson, K. Beise, B. Nutter		
Meeting Action: Mr. DeMichael presented an updated outline as a progress report. Should have a final outline for next meeting and possibly some text written.		

Item Number: NB14-0602A	NBIC Location: Part 1	No Attachment
General Description: Improve index in Part 1 relating to pressure relief devices		
Task Group: M. Brodeur (PM), S. Cammeresi, K. Beise		
Meeting Action: Ms. Brodeur provided a progress report and expects to have a proposal to vote on by the next meeting.		

Item Number: NB14-0602B	NBIC Location: Part 2	No Attachment
General Description: Improve index in Part 2 relating to pressure relief devices		
Task Group: D. Marek (PM), B. Donalson, D. DeMichael, B. Hart		
Meeting Action: PM changed to D. Marek. Mr. Marek provided progress report and expects to have a proposal to vote on by next meeting.		

Item Number: NB14-0602C	NBIC Location: Part 3	No Attachment
General Description: Improve index in Part 3 relating to pressure relief devices		
Task Group: B. Nutter (PM), R. McCaffrey, T. Patel, K. Simmons		
Meeting Action: With the pressure relief device paragraphs being removed from Part 3, no further work will be done on this item until the new Part 3 with text removed and new Part 4 get published.		

Item Number: NB15-0103	NBIC Location: Part 1, 2.9.6 c)	See Attachment A
General Description: Update requirements for power boiler pressure relief valve mounting and discharge		
Task Group: R. McCaffrey (PM), J. Ball, D. Marek		
Meeting Action: Mr. Marek presented a proposal. A motion was made and seconded to accept the proposal. After discussion a vote was taken and the motion unanimously carried. This item was forwarded to the main committee for action.		

Item Number: NB15-0301	NBIC Location: Part 3, 4.5.2	No Attachment
General Description: Evaluate backpressure testing requirement for owner/users		
Task Group: A. Cox (PM), T. Tarbay, D. DeMichael, B. Nutter		
Meeting Action: Immediately following the January meeting additional votes were solicited from members who were not present at the meeting. With the additional votes, the motion carried to close with no action. This item is on the main committee agenda for action.		

Item Number: NB15-0304	NBIC Location: Part 3, 5.12.3	See Attachment B
General Description: Review verification of manufacturer's nameplate information		
Task Group: B. Nutter (PM), S. Irvin, D. McHugh		
Meeting Action: Immediately following the January meeting additional votes were solicited from members who were not present at the meeting. With the additional votes, the motion carried. This item is on the main committee agenda for action.		

Item Number: NB15-0305	NBIC Location: Part 1	No Attachment
General Description: Create Guidelines for Installation of Overpressure Protection by System Design.		
Task Group: B. Nutter, A. Renaldo, D. Marek (PM), D. DeMichael		
Meeting Action: Mr. Marek presented a draft proposal as a progress report. Mr. DeMichael added to task group.		

Item Number: NB15-0307	NBIC Location: Part 3	No Attachment
General Description: Create Guidelines for Repair of Pin Devices.		
Task Group: D. McHugh (PM), J. Satterthwaite		
Meeting Action: Mr. McHugh sent a progress report via email which Mr. Beirne presented stating that Mr. McHugh has input from five manufacturers and will compile the information and should have a draft proposal to present at the next meeting.		

Item Number: NB15-0308	NBIC Location: Part 1	No Attachment
General Description: - Create Guidelines for Installation of Pressure Relief Devices for Organic Fluid Vaporizers.		
Task Group: T. Patel (PM), K. Beise, B. Nutter		
Meeting Action: Mr. Patel stated that progress continues and should have a draft proposal for the next meeting.		

Item Number: NB15-0310	NBIC Location: Part 3, 1.7.5.4	No Attachment
General Description: Give Guidance as to Which Spring Chart Should be used in Repairs.		
Task Group: A. Cox (PM), B. Nutter, M. Brodeur, T. Patel, K. Simmons, R. McCaffrey, S. Irvin		
Meeting Action: No progress was made on this item. S. Irvin (Cox's alternate) was added to task group and will work on this item.		

Item Number: NB15-0312	NBIC Location: Part 2, 2.57 and 2.5.8	See Attachment C
General Description: Re-evaluate T&P Valve Inspection Requirements Based on Robert Boiko Presentation.		
Task Group: R. Boiko, J. Ball (PM), A. Cox, A. Renaldo		
Meeting Action: This item was letter balloted between meetings and received one negative (B. Nutter). After discussion at this meeting Mr. Nutter withdrew his negative resulting in a unanimous approval. This item was forwarded to the main committee for action.		

Item Number: NB15-0314	NBIC Location: Part 1, 3.9.4.2	No Attachment
General Description: Review of Y-Base or Valve less Headers for Use in T&P Valve Installations.		
Task Group: D. McHugh (PM), B. Nutter, and D. Marek		
Meeting Action: No progress was made on this item.		

Item Number: NB15-0315	NBIC Location: Part 1, 4.5.6 and 5.3.6	No Attachment
General Description: Review isolation Valve Requirements.		
Task Group: D. DeMichael (PM), B. Nutter, A. Renaldo, D. Marek		
Meeting Action: Task group work continues on this item.		

Item Number: NB15-0321	NBIC Location: Part 2, 2.5.7 a)	No Attachment
General Description: Review testing requirements for inservice testing of pressure relief devices		
Task Group: A. Cox (PM), A. Renaldo, D. Marek, S. Irvin, D. DeMichael, B. Nutter, J. Ball		
Meeting Action: No progress was made on this item. D. Marek, S. Irvin, D. DeMichael, B. Nutter, J. Ball were added to task group.		

Item Number: NB15-0324	NBIC Location: None	No Attachment
General Description: Create Guidelines for Inspection and Testing Frequencies with respect to shelf life and storage of pressure relief valves.		
Task Group: A. Rendaldo (PM), B. Nutter, K. Simmons, D. Marek		
Meeting Action: Mr. Renaldo presented some research done by surveying manufacturers for their recommendations.		

Item Number: NB15-1203	NBIC Location: Part 3 Supplement 9	See Attachment D
General Description: Update language in Part 3 Supplement 9 regarding NR		
Task Group: NR Task Group		
Meeting Action: A proposal was letter balloted between meetings. With one comment and one negative. The negative (Cox) and comment were addressed with no changes. This item passed SC-PRD via letter ballot and will be forwarded to the main committee for action.		

Item Number: NB15-2401	NBIC Location: Part 3, 4.5.2	No Attachment
General Description: Steam set on air by non-owner-user.		
Task Group: R. Donalson (PM), T. Patel, J.A. Cox		
Meeting Action: A motion was made and seconded to close this item with no action. A vote was taken and the motion passed unanimously. This item was forwarded onto the main committee for action.		

Item Number: NB15-3201	NBIC Location: Part 2, S8.2	See Attachment E
General Description: Address pressure calculations in Part 2, S8.2		
Task Group: A. Renaldo (PM)		
Meeting Action: This item was letter balloted between meetings and pass unanimously. This item is on the main committee agenda for action.		

Item Number: NB16-0601	NBIC Location: Part 3, S7	See Attachment F
General Description: Clarify definition of rerate, conversion for pressure relief valves; came from item NB15-1203 from NR task group		
Task Group: NR Task Group		
Meeting Action: A motion was made and seconded to accept the proposal drafted by the NR Task Group. After discussion a vote was taken and the motion carried unanimously. This item was forwarded to the main committee for action.		

Item Number: NB16-0603	NBIC Location: Part 3, S7 and S9	No Attachment
General Description: Add requirements for when the "NR" program is applied to safety related relief valves in nuclear service, came from NR task group		
Task Group: NR Task Group		
Meeting Action: This item will be letter balloted between meetings.		

Item Number: NB16-0902	NBIC Location: Part 2, 2.5.8	See Attachment G
General Description: Adjust requirements to include 400 psi in one of the two options		
Task Group: None assigned		
Meeting Action: A proposal was drafted and motion made and seconded to accept the proposal. After discussion, a vote was taken and the motion carried unanimously. This item was forwarded to the main committee for action.		

Item Number: NB16-1501	NBIC Location: Part 3, 5.7.5	See Attachment H
General Description: Revise nameplate for nuclear pressure relief valves		
Task Group: NR Task Group		
Meeting Action: A motion was made and seconded to accept the proposal drafted by the NR Task Group. After discussion and some revisions a vote was taken to accept the revised proposal and the motion carried unanimously. This item was forwarded to the main committee for action.		

8. New Business

Item Number: NB16-0809A	NBIC Location: Part 4	See Attachment I
General Description: Staff Edits and adding a General Section to Part 4		
Task Group: NB Staff		
Meeting Action: A motion was made and seconded to accept the proposal. After discussion and some revisions a vote was taken to accept the revised proposal and the motion carried unanimously. This item was forwarded to the main committee for action.		

Item Number: NB16-0401	NBIC Location: Part 4	No Attachment
General Description: Inconsistencies with Seal I.D. vs. Nameplate for test only		
Task Group: S. Irvin (PM), T. Patel, D. Marek, M. Brodeur, B. Nutter		
Meeting Action: A task group was formed to work on this item.		

Item Number: NB16-0805	NBIC Location: Part 4	No Attachment
General Description: Temperature ratings for discharge piping and fittings		
Task Group: A. Renaldo (PM), T. Patel, D. Marek		
Meeting Action: A task group was formed to work on this item.		

Item Number: NB15-0108	NBIC Location: Part 4	No Attachment
General Description: High Temp Hot Water Boilers PRD Requirements		
Task Group: A. Renaldo (PM)		
Meeting Action: A task group was formed to work on this item.		

9. Presentations

Mr. Gary Scribner and Ms. Kimberly Miller gave presentations regarding the Webex meetings for addressing public review comments.

10. Future Meetings

January 11, 2017 – San Diego, California

July 19, 2017 – Columbus, Ohio

11. Adjournment

A motion was made, seconded, voted on, and unanimously passed to adjourn the meeting at approximately 4:15 PM

Respectfully Submitted,

Thomas P. Beirne, P.E.

Secretary, NBIC Subcommittee Pressure Relief Devices

pc: D. Douin

D. Cook

B. Besserman

NB15-0103

Part 1, Section 2.9.6 c) / Part 4, 1.3.10 c)

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

NB15-0304
01/13/2016
Page 1 of 1**5.12.3 CHANGES TO ORIGINAL PRESSURE RELIEF VALVE NAMEPLATE INFORMATION**

- a) If the set pressure is changed, the set pressure, capacity, and blowdown, if applicable, on the original nameplate or stamping shall be marked out, but left legible. The new capacity shall be based on that for which the valve was originally certified.
- b) If service fluid is changed, the capacity, including units, on the original nameplate or stamping shall be marked out, but left legible. The new capacity shall be based on that for which the valve was originally certified, or if a conversion has been made, as described in NBIC Part 3, S7.2 on the capacity certification for the valve as converted.
- c) If the Type/Model number is changed, the Type/Model number on the original nameplate shall be marked out, but left legible. or stamping
- d) If the blowdown is changed, the blowdown 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. or stamping
- e) Incorrect information on the original manufacturer's nameplate shall be marked out, but left legible. Corrected information shall be indicated on the repair nameplate and noted on the document as required by the quality system. 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.

5.12.4 TEST ONLY NAMEPLATE

- a) Where a valve has been tested and adjusted to restore the nameplate set pressure, as permitted by NBIC Part 3, S7.10.1, but not otherwise repaired, a "Test Only" nameplate shall be applied that contains the following information:
- 1) Name of responsible organization;
 - 2) Date of test;
 - 3) Set Pressure; and
 - 4) Identification, such as "Test Only."
- b) A "Test Only" nameplate is also recommended when periodic testing has been performed, even when no adjustments have been made, for the purpose of identifying the date the valve was tested.
- c) The existing repair nameplates, if applicable, shall not be removed during such testing.

5.12.5 REPLACEMENT OF ILLEGIBLE OR MISSING NAMEPLATES**a) Illegible Nameplates**

When information on the original manufacturer's or assembler's nameplate or stamping is illegible, but traceability can be confirmed, the nameplate or stamping will be augmented by a nameplate furnished by the "VR" Stamp Holder stamped "Duplicate." It shall contain all information that originally appeared on the nameplate or valve, as required by the applicable section of the ASME Code, except the "V," "HV," or "UV" symbol and the National Board mark. The repair organization's nameplate, with the "VR" stamp and other required data specified in NBIC Part 3, 5.12.2, will make the repairer responsible to the owner and the Jurisdiction that the information on the duplicate nameplate is correct.

b) Missing Nameplates

When the original valve nameplate is missing, the repair organization is not authorized to perform repairs to the valve under the "VR" program, unless positive identification can be made to that specific valve and

"FOR COMMITTEE USE ONLY"

NB15-0312 AMR Edits 2-22-16
Rev 3

Assigned Action: Revise potable hot water PRV requirements, and revise all hot water tank PRV inspection requirements, per Mr. Boiko's recommendations.

Boiko request #1: Add requirements for CSA stamp and rating to be used on potable water PRV.

Boiko request #2: Require inspection of temperature probe on potable water PRV.

Part 4, 1.5.4 (Part 1, 3.9.4) TEMPERATURE AND PRESSURE RELIEF VALVE REQUIREMENTS FOR POTABLE WATER HEATERS

c) The required relieving capacity in Btu/hr (W) of the pressure relief valve shall not be less than the maximum allowable input unless the water heater is marked with the rated burner input capacity of the water heater on the casing in a readily visible location, in which case the rated burner input capacity may be used as a basis for sizing the pressure relief valves. The relieving capacity for electric water heaters shall be 3500 Btu/hr (1.0 kW) per kW of input. In every case, the following requirements shall be met. Pressure relief valve capacity for each water heater shall be such that with the fuel burning equipment installed and operating at maximum capacity, the pressure cannot rise more than 10% above the maximum allowable working pressure. Many temperature and pressure relief valves have a National Board capacity certified rating which was determined according to ASME Code requirements, and a lower CSA rating value. Where the ASME Code is the only referenced Code of Construction the National Board capacity certified rating may be used. If the water heater is not an ASME vessel, or the CSA rating is required by another standard (such as a plumbing or building code) then that rating shall be used.

Part 4, 2.2.6 (Part 2, 2.5.8) RECOMMENDED INSPECTION AND TEST FREQUENCIES FOR PRESSURE RELIEF DEVICES

e) Water heaters

Manual check every two months, or as determined based upon inspection history and manufacturer recommendations. Every 3 years, remove safety valve to inspect temperature probe for damage, buildup, or corrosion. The temperature probe shall be checked for the condition of the coating material and freedom of movement without detaching. If the probe pulls out or falls off during inspection, the valve shall be repaired or replaced. Due to the relatively low cost of safety valves for this service, it is recommended that a defective valve be replaced with a new valve if a repair or resetting is indicated.

SUPPLEMENT 9

~~PROCEDURES TO EXTEND THE “VR” CERTIFICATE OF AUTHORIZATION AND STAMP TO FOR REPAIRS OF~~ ASME “NV” STAMPED PRESSURE RELIEF DEVICES S9.1 INTRODUCTION

~~Approval to extend the scope of the National Board “VR” Certificate of Authorization to the Certificate Holder to use the “VR” Stamp on~~ ASME Code “NV” Class 1, 2, or 3 stamped pressure relief devices, which have been capacity certified by the National Board, ~~may be given subject to the provisions that follow.~~ may be repaired provided the following requirements are met.

S9.2 ADMINISTRATIVE PROCEDURES

- a) The repair organization shall hold a valid “VR” *Certificate of Authorization*.
- b) The repair organization shall obtain a National Board “NR” *Certificate of Authorization* and stamp. The requirements for said certificate and stamp include, but are not limited to, the following. The repair organization shall:
 - 1) Maintain a documented quality assurance program that meets the applicable requirements of NBIC Part 3, 1.8. This program shall also include all the applicable requirements for the use of the “VR” stamp;
 - 2) Have a contract or agreement with an Inspection Agency to provide inspection of repaired “NV”- stamped pressure relief devices by Inspectors who have been qualified in accordance with the requirements of ASME QAI-1, *Qualifications for Authorized Inspection*;
 - 3) Successfully complete a survey of the quality assurance program and its implementation. This survey shall be conducted by representatives of the National Board, the Jurisdiction wherein the applicant’s repair facilities are located, and the applicant’s Authorized Inspection Agency. Further verification of such implementation by the survey team may not be necessary if the applicant holds a valid ASME “NV” certificate and can verify by documentation the capability of implementing the quality assurance program for repair of “NV”-stamped pressure relief devices, covered by the applicant’s ASME “NV” certificate.
- c) The application of the “NR” *Certificate of Authorization* and stamp shall clearly define the scope of intended activities with respect to the repair of Section III, “NV”-stamped pressure relief devices.
- d) Revisions to the quality assurance program shall be acceptable to the Authorized Nuclear Inspector Supervisor and the National Board before being implemented.
- e) The scope of the “VR” *Certificate of Authorization* shall include repair of “NV”-stamped pressure relief devices.
- f) Verification testing of valves repaired by the applicant shall not be required provided such testing has been successfully completed under the applicant’s “VR” certification program for the applicable test fluids.
- g) A survey of the applicant for the “VR” *Certificate of Authorization* and endorsement of the repair of “NV”- stamped pressure relief devices may be made concurrently.

S9.3 GENERAL RULES

- a) ASME Code Section III, “NV”-stamped pressure relief devices, which have been repaired in accordance with these rules, shall be stamped with both the “VR” and “NR” stamps.

- b) The “VR” and “NR” stamps shall be applied only to “NV” stamped (Class 1, 2, or 3) National Board capacity certified pressure relief devices that have been disassembled, inspected, and repaired as necessary, such that the valves’ condition and performance are equivalent to the standards for new valves.
- c) All measuring and test equipment used in the repair of pressure relief devices shall be calibrated against certified equipment having known valid relationships to nationally recognized standards.
- d) Documentation of the repair of “NV”-stamped pressure relief devices shall be recorded on the National Board Form NVR-1, *Report of Repair/ Replacement Activities for Nuclear Pressure Relief Devices*, in accordance with the requirements of NBIC Part 3, 1.8.
- e) When an ASME “NV”-stamped pressure relief device requires a duplicate nameplate because the original nameplate is illegible or missing, it may be applied using the procedures of NBIC Part 3, 5.12.5 provided concurrence is obtained from the Authorized Nuclear Inspector and Jurisdiction. In this case the nameplate shall be marked “SEC. III” to indicate original ASME Code stamping.
- f) Repair activities for pressure relief devices shall not include rerating of the device. Set pressure changes within the range of the valve manufacturer’s capacity certification and the design pressure of the valve (see Part 3, 5.12.3) are permitted, provided the new set pressure and capacity rating are reconciled with the design of the system where the device will be used. Set pressure changes are not considered to be rerating.
- g) Conversions of pressure relief devices as described in NBIC Part 3, S7.2 [ba](#)) are permitted as part of repair activities.
- h) Set pressure changes or conversions of pressure relief devices shall be described in the “Remarks” section of Form NVR-1.

NB15-3201 AMR edits
Rev 1, 1-14-16
Part 2, S8.2 / Part 4 S2.2

The purpose of this action item is to correct the math in example (b). $100/1.25 = 80$, not 75. I also moved the advice about blowdown from example (b) into a separate paragraph. That way, a reader who doesn't feel the need to see the examples, because he can do math, will still see the advice about blowdown.

Per Mr. Nutter's recommendation, I added the parenthetical noting that the differential from 25% of operating pressure is equivalent to 20% of safety relief valve set pressure. Mathematically, the two are identical. That is why I use ie instead of eg.

Maximum recommended boiler operating pressure = safety relief valve set pressure/125% = 80% of safety relief valve set pressure. $100\% - 80\% = 20\%$ differential from safety relief valve set pressure

S8.2 HOT-WATER HEATING BOILERS

For hot-water heating boilers, the recommended pressure differential between the pressure relief valve set pressure and the boiler operating pressure should be at least 10 psi (70 kPa), or 25% of the boiler operating

pressure (i.e. 20% of safety relief valve set pressure), whichever is greater.

Two examples follow:

a) If the safety relief valve of a hot-water heating boiler is set to open at 30 psi (200 kPa), the boiler operating pressure should not exceed 20 psi (140 kPa).

b) If the safety relief valve of a hot water heating boiler is set to open at 100 psi (700 kPa), the boiler operating pressure should not exceed ~~8075~~ psi (~~520~~ kPa).

~~Section IV of the ASME Code does not require that safety relief valves used on hot water heating boilers have a specified blowdown. Therefore, to help ensure that the safety relief valve will close tightly after opening and when the boiler pressure is reduced to the normal operating pressure, the pressure at which the valve closes should be well above the operating pressure of the boiler. Section IV of the ASME Code does not require that safety relief valves used on hot water heating boilers have a specified blowdown. Therefore, to help ensure that the safety relief valve will close tightly after opening and when the boiler pressure is reduced to the normal operating pressure, the pressure at which the valve closes should be well above the operating pressure of the boiler.~~

NB16-0601 7-18-16

Glossary of Terms

Re-rating (re-rate) – See alteration. Re-rate does not apply to pressure relief devices.

NB16-0902

2015 NBIC Part 2

2.5.8 RECOMMENDED INSPECTION AND TEST FREQUENCIES FOR PRESSURE RELIEF DEVICES

a) Power Boilers

1) Pressure less than 400 psig (2.76 MPa): Manual check every 6 months; pressure test annually to verify nameplate set pressure or as determined by operating experience as verified by testing history.

2) Pressure ~~greater than~~ 400 psig (2.76 MPa) or greater: Pressure test to verify nameplate set pressure every three years or as determined by operating experience as verified by testing history.

NB16-1501 NR Task Group 7-18-16

FIGURE 5.7.5-f
REQUIRED MARKINGS FOR NUCLEAR REPAIRS OR REPLACEMENTS

The diagram shows a rectangular marking area. At the top left is the NR logo. To its right is a line for 'CERTIFICATE HOLDER'. Below the logo is 'NATIONAL BOARD "NR" CERTIFICATE NUMBER' followed by a reded-out line '~~COMPLETED IN ACCORDANCE WITH ASME SECTION XI~~'. Below this are two rows: 'REPAIR' with an unchecked checkbox and 'REPLACEMENT' with an unchecked checkbox. To the right of these is a line for 'EDITION', 'ADDENDUM', and 'CODE CASE(S)', with a red arrow pointing to it from the text 'Unique Identifier'. At the bottom is a line for 'DATE OF REPAIR OR REPLACEMENT'.

FIGURE 5.7.5-g
REQUIRED MARKINGS FOR REPAIR ~~OR REPLACEMENT~~ OF NUCLEAR PRESSURE RELIEF VALVES

The diagram shows a rectangular marking area. At the top left is the NR logo with a red '4' above it, and the VR logo to its right. To the right is a line for 'CERTIFICATE HOLDER'. Below the logos is 'NATIONAL BOARD CERTIFICATE NOS.' followed by a reded-out line '~~COMPLETED IN ACCORDANCE WITH ASME SECTION XI~~'. Below this are two rows: 'REPAIR' with an unchecked checkbox and 'REPLACEMENT' with an unchecked checkbox. To the right of these is a line for 'EDITION', 'ADDENDUM', and 'CODE CASE(S)', with a red arrow pointing to it from the text 'Unique Identifier'. Below this are two lines: 'SET PRESSURE' and 'CAPACITY (IF CHANGE IN SET PRESSURE)'. At the bottom is a reded-out line for 'DATE OF REPAIR ~~OR REPLACEMENT~~'.

[Note 4: For Group 3, see Part 3, S9.3 a\)](#)

Comment [TB1]: Can be added back in if item NB16-0603 gets approved.

PART 4, SECTION 1

PRESSURE RELIEF DEVICES-GENERAL AND ADMINISTRATIVE REQUIREMENTS

1.1 SCOPE

This Part provides guidelines and requirements for the installation, inservice 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 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) Organizations performing repairs to pressure relief valves shall be accredited as described in this section, as appropriate for the scope of work to be performed.

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

1.4.1 ACCREDITATION PROCESS

a) The National Board administers accreditation programs for authorization of organizations performing repairs to pressure relief valves.

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 to pressure relief valves. Depending upon the expected scope of activities at the time of review, organizations may be authorized to perform repairs either in the shop only, field only, or shop and field. Repair 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 plants or shops in more than one location, the organization shall submit separate applications for each plant or shop. The organization may perform repairs in its plants, shops, or in the field, provided such operations are described in the organization's Quality System.

PART 4, SECTION 12

INSTALLATION OF PRESSURE RELIEF DEVICES

~~12.1 INSTALLATION OF PRESSURE RELIEF DEVICES~~SCOPE

NBIC Part 4 Section 2 provides requirements for the installation of pressure relief devices on power boilers, steam heating boilers, hot-water heating boilers, hot-water supply boilers, potable water heaters, pressure vessels and piping.

The correct selection of appropriate pressure relief devices (PRDs) and the proper installation of those devices are critical to the safe operation of pressure retaining Items. Following are requirements for the installation of pressure relief devices for protection of different types of pressurized equipment. See NBIC Part 1 for general installation requirements.

Moved to Paragraph 1.3

~~1.2 PRESSURE RELIEF DEVICES — DEFINITIONS~~

Paragraphs a) through f) moved to glossary

~~a) Pressure Relief Device: A device designed to prevent pressure or vacuum from exceeding a predetermined value in a pressure vessel by the transfer of fluid during emergency or abnormal conditions.~~

~~b) Pressure Relief Valve (PRV): A pressure relief device designed to actuate on inlet static pressure and reclose after normal conditions have been restored.~~

~~c) Safety valve: A pressure relief valve characterized by rapid opening and normally used to relieve compressible fluids.~~

~~d) Safety relief valve: A pressure relief valve characterized by rapid opening or by gradual opening that is generally proportional to the increase in pressure. It can be used for compressible or incompressible fluids.~~

~~e) Relief valve: A pressure relief valve characterized by gradual opening that is generally proportional to the increase in pressure. It is normally used for incompressible fluids.~~

~~f) 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.~~

Moved to Paragraph 1.3.1

~~1.2.1 ADDITIONAL DEFINITIONS RELATING TO PRESSURE RELIEF DEVICES~~

~~Unless otherwise specified in these rules and procedures, the definitions relating to pressure relief devices in Section 2 of ASME PTC25 shall apply.~~

24.32 PRESSURE RELIEF VALVES FOR POWER BOILERS

See NBIC Part 1, par. 2.2 for the boilers covered under this section.

24.32.1 GENERAL REQUIREMENTS

a) Only direct spring loaded safety valves, direct spring loaded safety relief valves, or pilot operated pressure relief valves designed to relieve steam shall be used for steam service.

b) Safety relief valves are valves designed to relieve either steam or water, depending on the application.

c) Pressure relief valves shall be manufactured in accordance with a national or international standard.

d) Deadweight or weighted-lever pressure relief valves shall not be used.

e) For high temperature water boilers, pressure relief valves shall have a closed bonnet, and valve bodies shall not be constructed of cast iron.

PART 4, SECTION 23

INSERVICE INSPECTION OF PRESSURE RELIEF DEVICES

23.1 INSERVICE INSPECTION OF PRESSURE RELIEF DEVICES SCOPE

This section provides general guidelines and requirements for conducting inservice inspection and testing of pressure relief devices.

The inspection of pressure relief devices is often coordinated with the inspection of the system. See NBIC Part 2 for inservice inspection requirements and procedures for other portions of the equipment not discussed in this section.

23.2 SCOPE GENERAL

a) The most important appurtenances on any pressurized system are the pressure relief devices provided for overpressure protection of that system. These are devices such as pressure relief valves, rupture disks, and other nonreclosing devices that are called upon to operate and reduce an overpressure condition.

b) These devices are not designed or intended to control the pressure in the system during normal operation. Instead, they are intended to function when normal operating controls fail or abnormal system conditions are encountered.

c) Periodic inspection and maintenance of these important safety devices is critical to ensure their continued functioning and to provide assurance that they will be available when called upon to operate. See 23.2.6 for recommended testing frequency for PRDs.

d) Inspection areas of concern include:

- 1) correct set pressure; (matching of set pressure to MAWP)
- 2) safety considerations;
- 3) device data;
- 4) condition of the device;
- 5) condition of the installation; and
- 6) testing and operational inspection.

23.2.1 PRESSURE RELIEF DEVICE DATA

a) Nameplate marking or stamping of the device should be compared to stamping on the protected pressure-retaining item. For a single device, the set pressure shall be no higher than the maximum allowable working pressure (MAWP) marked on the protected pressure-retaining item or system.

b) When more than one pressure relief device is provided to obtain the required capacity, only one pressure relief device set pressure need be at or below the maximum allowable working pressure. The set pressure of additional devices may exceed the MAWP, as permitted by the original code of construction.

c) Verify nameplate capacity and, if possible, compare to system capacity requirements.

d) Check identification on seals and ensure they match nameplates or other identification (repair or reset nameplate) on the valve or device.

23.2.2 DEVICE CONDITIONS

a) The valve or device shall be checked for evidence that it is not leaking or not sealing properly. Evidence of leakage through pressure-relief valves may indicate that the system is being operated at a pressure that is too close to the valve's set pressure. (See Supplement 2 for guidance on the pressure differential between the pressure relief valve set pressure and system operating pressure.)

PART 4, SECTION 34

REPAIR OF PRESSURE RELIEF VALVES

34.1 REPAIR OF PRESSURE RELIEF DEVICES, SCOPE

This section provides general requirements that apply to repairs to pressure relief valves.

a) Repairs may be required because of defects found during periodic inspections, ~~because testing, operation, or maintenance has identified that valve performance does not meet the original code of construction requirements, failure during operation, or for routine preventative 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) The National Board administers four specific accreditation programs:

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

"VR" — Repairs to Pressure Relief Valves

"NR" — Repair and Replacement Activities for Nuclear Items

"T/O" — Inservice Testing Only of Pressure Relief Valves

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

d) Requirements for the "T/O" are found in NB-528, Accreditation of "T/O" Test Only Organizations.

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

34.2 GENERAL REQUIREMENTS

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

b) Conversions, changes, or adjustments affecting critical parts are also considered repairs. The scope of conversions may include changes in service fluid and changes such as bellows, soft seats, and other changes that may affect Type/Model number provided such changes are recorded on the document as required for a quality system and the repair nameplate. (See 34.7.1).

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

34.2.1 VR REPAIR

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

1) Complete disassembly, cleaning, and inspection of parts, repair or replacement of parts found to be defective, reassembly, testing as required by 34.6, sealing and application of a repair nameplate. When completed, the valve's condition and performance shall be equivalent to the standards for new valves.

2) The administrative requirements for National Board Accreditation apply only to valves that are stamped with an ASME "V," "UV," or "NV" Code symbol or marked with an ASME "HV" symbol and have been capacity certified on the applicable fluid by the National Board.

Liquid Pressure Test — A pressure test using water or other incompressible fluid as a test medium.

Manufacturer's Documentation — The documentation that includes technical information and certification required by the original code of construction.

Mechanical Assembly — The work necessary to establish or restore a pressure retaining boundary, under supplementary materials, whereby pressure-retaining capability is established through a mechanical, chemical, or physical interface, as defined under the rules of the NBIC.

Mechanical Repair Method — A method of repair, that restores a pressure retaining boundary to a safe and satisfactory operating condition, where the pressure retaining boundary is established by a method other than welding or brazing, as defined under the rules of the NBIC

Metering Device - A method of controlling the amount of fuel, or air, flowing into the combustion zone.

NBIC — The *National Board Inspection Code* published by The National Board of Boiler and Pressure Vessel Inspectors.

"NR" Certificate Holder — An organization in possession of a valid "NR" *Certificate of Authorization* issued by the National Board.

National Board — The National Board of Boiler and Pressure Vessel Inspectors.

National Board Commissioned Inspector — An individual who holds a valid and current National Board Commission.

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.

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 (1100 kPa) and temperature not in excess of 210°F (99°C).

- 1) 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.
- 2) 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 directly to the system or store water within the same appliance.
- 3) Circulating Water Heater - A potable water heater which furnishes water directly to the system or to a separate storage tank. Circulating water heaters may be either natural or forced flow.

Pressure-Retaining Items (PRI) — Any boiler, pressure vessel, piping, or material used for the containment of pressure, either internal or external. The pressure may be obtained from an external source, or by the application of heat from a direct source, or any combination thereof.

Pressure Relief Device -- A device designed to prevent pressure or vacuum from exceeding a predetermined value in a pressure vessel by the transfer of fluid during emergency or abnormal conditions.

Pressure Relief Valve (PRV) -- A pressure relief device designed to actuate on inlet static pressure and reclose after normal conditions have been restored.

Pressure Test — A test that is conducted using a fluid (liquid or gas) contained inside a pressure-retaining item.

Pressure Vessel – A pressure vessel is a container other than a boiler or piping used for the containment of pressure.

Relief Valve -- A pressure relief valve characterized by gradual opening that is generally proportional to the increase in pressure. It is normally used for incompressible fluids.

Repair — The work necessary to restore pressure-retaining items to a safe and satisfactory operating condition.

Re-ending — A method used to join original code of construction piping or tubing with replacement piping or tubing material for the purpose of restoring a required dimension, configuration or pressure-retaining capacity.

Re-rating — See alteration.

“R” Certificate Holder — An organization in possession of a valid “R” *Certificate of Authorization* issued by the National Board.

Safe Point of Discharge – A location that will not cause property damage, equipment damage, or create a health or safety threat to personnel in the event of discharge.

Safety Relief Valve -- A pressure relief valve characterized by rapid opening or by gradual opening that is generally proportional to the increase in pressure. It can be used for compressible or incompressible fluids.

Safety Valve -- A pressure relief valve characterized by rapid opening and normally used to relieve compressible fluids.

Settings — Those components and accessories required to provide support for the component during operation and during any related maintenance activity.

Shop — A permanent location, whose address is shown on the *Certificate of Authorization*, from which a Certificate Holder controls the repair and/or alteration of pressure-retaining items.