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*THE NATIONAL BOARD
OF BOILER AND PRESSURE VESSEL INSPECTORS*

NATIONAL BOARD INSPECTION CODE SUBGROUP PRESSURE RELIEF DEVICES

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Minutes

Meeting of January 9th, 2024
San Antonio, TX

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 Daniel Marek called the meeting to order at 8:01 CST on Tuesday, January 9, 2024. Members and Visitors in attendance can be found on the Attendance Sheet (Attachments Pg 1)

2. Announcements

- This meeting marks the end of Cycle C for the 2025 NBIC edition. The committees will have until the end of the July 2024 NBIC meeting to approve items for inclusion in the 2025 NBIC.
- The National Board will be hosting a reception on Wednesday evening from 5:30 p.m. to 7:30 p.m. in Veramendi (fourth level of the hotel).
- The National Board will be hosting breakfast and lunch on Thursday in Veramendi 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.
- There is a new tutorial for submitting NBIC requests available on the National Board website Business Center. Visit “Requests” under the NBIC Tab. There is an updated NBIC Style Guide available on the National Board Business Center under the NBIC tab, NBIC Committee Documents sub-tab
- 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. If you are here in person, and did not register, please visit the National Board website to register now. Registering will make sure we have an accurate count for the reception, breakfast, and lunch. It is also a good way to make sure we have the most up-to-date contact information.

3. Adoption of the Agenda

An amended agenda was presented to the committee. A motion was made to adopt the revised agenda. The motion was seconded, and the agenda was adopted unanimously.

4. Approval of Minutes from the July 11, 2023 Meeting

A motion was made to approve the minutes from the July 11, 2023 meeting. The motion was seconded and unanimously approved.

5. Review of the Roster

a. Nominations

- i. Mr. Jeremy Grace is interested in becoming a member of Subgroup PRD, representing Users.
 - a. A motion was made to recommend Mr. Jeremy Grace for membership in SG PRD. The motion was seconded and approved unanimously.
- ii. Mr. Gabe Salwan is interested in becoming a member of Subgroup PRD, representing General Interest
 - a. A motion was made to recommend Mr. Gabe Salwan for membership in SG PRD. The motion was seconded and approved unanimously.

b. Reappointments

- i. The following memberships were set to end prior to the July 2024 NBIC meeting: Mr. Jay Simms.
 - a. A motion was made to recommend reappointment of Mr. Jay Simms to Subgroup PRD. The motion was seconded and approved unanimously.

c. Officer Nominations

d. Resignations

6. Interpretation Requests

There are currently no interpretation requests open for Part 4.

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		
January 2024 Meeting Action: Progress report. This item cannot be moved forward without changing the Scope of NBIC Part 4. A motion was made to change the General Description of this item from “Create Guidelines for Installation of Overpressure Protection by System Design” to “Create Guidelines to address Overpressure Protection by System Design”. The motion was seconded and approved with one abstention (E. Creaser – See Attachment page 2). A new proposal for this item will be developed by the task group. J. Grace and D. Sullivan was added to the task group.		

Item Number: NB15-0307	NBIC Location: Part 4	No Attachment
General Description: Create Guidelines for Repair of Pin Devices.		
Task Group: D. McHugh (PM), A. Renaldo, T. Tarbay, R. McCaffrey, Jay Simms, C. Bear, C. Chernisky		
January 2024 Meeting Action: Progress report. An updated proposal will be sent to letter ballot for Subgroup PRD between meetings.		

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		
January 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		
January 2024 Meeting Action: Progress report. Comments from previous letter ballot will be incorporated and a revised proposal will be sent to letter ballot for Subgroups Installation and PRD between meetings.		

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

Item Number: 21-62	NBIC Location: Part 4, 4.8.5.4 i) 3)	No Attachment
<p>General Description: Verification of existing spring during repair activities</p> <p>Task Group: A. Donaldson (PM), B. Nutter, E. Creaser, P. Dhobi, T. Patel, J. Simms, J. Grace, D. Gonzales, T. Cardy</p> <p>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.</p> <p>January 2024 Meeting Action: Progress report. A proposal for this item will sent to letter ballot for Subgroup PRD between meetings.</p>		

Item Number: 22-08	NBIC Location: Part 4, 2.4.1.6 & 2.4.4.2; Part 1, 3.9.1.6 & 3.9.4.2	No Attachment
<p>General Description: Review and improve guidance for T&P valve installation relating to probe.</p> <p>Subgroup: PRD</p> <p>Task Group: D. Marek (PM), J. Ball, J. Wolf, T. Clark</p> <p>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.</p> <p>January 2024 Meeting Action: Progress report. Work continues on this item.</p>		

Item Number: 22-09	NBIC Location: Part 4, 4.6.1	No Attachment
<p>General Description: Add language to NBIC Part 4 for valves manufactured to Code Case 2787</p> <p>Subgroup: PRD</p> <p>Task Group: A. Donaldson (PM), H. Cornett, B. Nutter, T. Tarbay, J. Simms</p> <p>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).</p> <p>January 2024 Meeting Action: Progress report. Work continues on this item. R. Donalson was removed from the task group and H. Cornett was added.</p>		

Item Number: 22-16	NBIC Location: Part 4, 2.4.4 and Part 1, 3.9.4	Attachment Page 3-5
<p>General Description: Allow the use of pressure relief valves on potable water heaters.</p> <p>Subgroup: PRD</p> <p>Task Group: D. Sullivan (PM), J. Ball, T. Clark</p> <p>Explanation of Need: ASME Section IV, Part HLW-800.1 allows the use of pressure relief valves in place of temperature and pressure relief valves on potable water heaters. NBIC Parts 1 and 4 specifically require temperature and pressure relief valves, which is not consistent with the code of construction. Some manufacturers are shipping HLW stamped potable water heaters with pressure relief valves. Often the physical construction of these units is such that a temperature and pressure relief valve cannot be accommodated.</p> <p>January 2024 Meeting Action: This item passed both the Subcommittee PRD and Installation ballots and will go to Main Committee.</p>		

Item Number: 22-20	NBIC Location: Part 4, 4.7.4	No Attachment
<p>General Description: Inspection and testing of PRV's located above isolation valves.</p> <p>Subgroup: PRD</p> <p>Task Group: D. Marek (PM), K. Beise, J. Ball, E. Creaser, H. Cornett, A. Renaldo</p> <p>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.</p> <p>January 2024 Meeting Action: Progress report. Work continues on this item.</p>		

Item Number: 23-18	NBIC Location: Part 4, 4.2.2	Attachment Page 6
<p>General Description: Revision and clarification of Part 4, 4.2.2 for use of ASME Code Cases</p> <p>Subgroup: PRD</p> <p>Task Group: A. Donaldson (PM)</p> <p>Explanation of Need: 4.2.2 requires revision to clarify how ASME Code Cases are applied in the repair and conversion of pressure relief devices. Revision is also necessary to remove the requirement that the NBIC Main Committee adopt individual ASME Code Cases before they may be used in Jurisdictions that have adopted them. The current wording does not allow conversion of a device to no-longer comply with an ASME Code Case.</p> <p>January 2024 Meeting Action: A proposal for this item was revised based on comments from Main Committee and further discussion at SG PRD. A motion was made to accept the revised proposal. The motion was seconded and approved unanimously. The proposal will go to SC PRD.</p>		

Item Number: 23-31	NBIC Location: Part 4, 3.2.5 d) 5) and Part 2, 2.5.7 d) 5)	Attachment Page 7-12
General Description: Testing of liquid service valves to be water or other suitable liquid		
Subgroup: PRD		
Task Group: P. Dhobi (PM), K. Beise, T. Tarbay, T. Patel, H. Cornett, D. Marek		
Explanation of Need: The intent is that liquid service valves be tested on liquid. The term fluid can mean either liquid or vapor.		
January 2024 Meeting Action: A proposal was presented. After discussion and revision, a motion was made to accept the revised proposal. The motion was seconded and approved unanimously. The proposal will go to Subgroup Inspection for review and approval.		

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

8. New Business

9. Presentations

- a. Safety Valves for Traction Engines, presented by Jon Wolf

10. Future Meetings

Mr. Marek discussed future meetings. The currently scheduled meetings are below.

- July 15-18, 2024 – The Brown Hotel in Louisville, KY
- January 2025 – TBD

11. Adjournment

A motion was made to adjourn the meeting. The motion was seconded and approved unanimously. The meeting was adjourned at 2:04 PM CST

Respectfully Submitted,

A handwritten signature in black ink, appearing to read 'R. Viers', with a stylized flourish at the end.

Robert Viers
Secretary, Subgroup Pressure Relief Devices

Subgroup PRD Attendees - January 2024

MEMBERS:	Interest Category	Registered For	In Person	Remote	Not In Attendance
Kim Beise	National Board Certificate Holders	In Person	x		
Daniel Marek	General Interest	Remote		x	
Robert Viers	Secretary	In Person	x		
Nick Bailey*	General Interest	NR	x		
Eben Creaser	Jurisdictional Authorities	Remote		x	
Denis Demichael	General Interest	NR			
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	
Adam Renaldo	Users	In Person	x		
Delton Schirmer	Authorized Inspection Agencies	In Person	x		
Jay Simms	Manufacturers	In Person	x		
David Sullivan	Jurisdictional Authorities	In Person	x		
Thomas Tarbay	General Interest	Remote	x		
Ray Ceccarelli	Authorized Inspection Agencies	In Person	x		
Henry Cornett	Manufacturers	In Person	x		
Craig Theiler	National Board Certificate Holders	Remote	x		
Jon Wolf	Authorized Inspection Agencies	NR	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	
David Johnson	Retired	In Person	x	
Jeremy Grace	Chemours	In Person	x	
Gary Scribner	National Board of Boiler & Pressure Vessel Inspectors	In Person		
Ray Ceccarelli	FM Global	In Person		
Rob Troutt	TDLR	In Person		
John Burpee	State of Maine			x
Thomas Beime	National Board of Boiler & Pressure Vessel Inspectors	Remote		
Erik Heck	ARI-Armaturen	In Person	x	
Andrew Roberts	Flow Safe	Remote		
John Graves	Control Southern Inc	Remote		x
Tom Cardy	Setpoint Integrated Solutions	In Person	x	
Gabe Salwan	Quality Valve			x
Donald W. McGill	MPC Terminal Services	In Person		
Billy DeKeyzer	Trillium Flow Control	In Person	x	
Harrinton Henry	Arise			x
Jeff Churchill	Cargill			x
Kevin Anderson	Anderson Industries		x	
Greg Goosens	National Board of Boiler & Pressure Vessel Inspectors	In Person	x	

From: [Creaser, Eben \(JPS/JSP\)](#)
To: [Bob Viers](#)
Subject: Abstention from OPPSD
Date: Wednesday, January 10, 2024 9:51:43 AM

Bob,

I abstained from voting on this motion because of a conflict of interest. The final decision on the topic will being added to the scope will ultimately come to the BOT for decision and I believe it would be inappropriate to cast a ballot at this time on the topic.

Eben Creaser

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Submitted by: Joe Ball, Dave Sullivan, Tom Clark

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Part 4, 2.4.4 and Part 1, 3.9.4

Explanation of Need:

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

Suggested revisions to current text**Part 4****2.4.4 ~~TEMPERATURE AND~~ PRESSURE RELIEF VALVE REQUIREMENTS FOR POTABLE WATER HEATERS**

- a) Each water heater shall have at least one spring-loaded National Board capacity-certified temperature and pressure relief valve. ~~or pressure relief valve.~~ No ~~temperature and~~ pressure relief valve shall be smaller than NPS 3/4 (DN 20).

Note: Temperature and pressure relief valves are recommended for fired storage water heaters because of due to the additional temperature relief function they provided, and other standards for this equipment may require the use of temperature and pressure relief valves. The design or size of the water heater may not be compatible with the use of a temperature and pressure relief.

- a)
- b) The pressure setting shall be less than or equal to the maximum allowable working pressure of the water heater. However, if any of the other components in the hot-water supply system (such as e.g., valves, pumps, expansion or storage tanks, or piping) have a ~~lesser-lower~~ working pressure rating than the water heater, the pressure setting for the ~~temperature and~~ pressure relief valve(s) shall be based upon the component with the lowest maximum allowable working pressure rating. If more than one ~~temperature and~~ ~~pressure~~ relief valve is used, the additional valve(s) may be set within a range not to exceed 110% above of the set pressure of the first valve.
- c) The required relieving capacity ~~in Btu/hr (W)~~ of the ~~temperature and~~ pressure relief valve in Btu/hr (W) shall not be less than the maximum ~~allowable-rated heat~~ input unless the rated burner input capacity the water heater is marked on the water heater casing in a readily visible location. ~~with the rated burner input capacity of the water heater on the casing in a readily visible location, if~~ in which this case, the rated burner input capacity may be used as a basis for sizing the temperature and 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. T~~ ~~temperature and p~~ 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~~ exceed 110% above of

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Submitted by: Joe Ball, Dave Sullivan, Tom Clark

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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 Canadian Standards Association (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.

- d) If operating conditions are changed or additional heating surface is installed, the ~~temperature and~~ pressure relief valve capacity shall be increased, if necessary, to meet the new conditions and shall be in accordance with the above provisions. In no case shall the increased input capacity exceed the maximum allowable input capacity. ~~The Any~~ additional valves required, ~~on account of~~ resulting from changed conditions, may be installed on the outlet piping provided ed there is no intervening valve.

Part 1**3.9.4 PRESSURE RELIEF VALVE REQUIREMENTS FOR POTABLE WATER HEATERS**

- a) Each water heater shall have at least one spring-loaded National Board capacity-certified temperature and pressure relief valve or pressure relief valve. No ~~temperature and~~ pressure relief valve shall be smaller than NPS 3/4 (DN 20). ~~Note: Temperature and pressure relief valves are recommended for fired storage water heaters because of the additional temperature relief function they provide, and other standards for this equipment may require temperature and pressure relief valves.~~

Note: Temperature and pressure relief valves are recommended for fired storage water heaters due to the additional temperature relief function provided. Other standards for this equipment may require the use of temperature and pressure relief valves. The design or size of the potable water heater may not be compatible with the use of a temperature and pressure relief.

- a)
- b) The pressure setting shall be less than or equal to the maximum allowable working pressure of the water heater. However, if any of the other components in the hot-water supply system (~~such ase.g.~~, valves, pumps, expansion or storage tanks, or piping) have a ~~lower~~ lesser working pressure rating than the water heater, the pressure setting for the ~~temperature and~~ pressure relief valve(s) shall be based upon the component with the lowest maximum allowable working pressure rating. If more than one ~~temperature and~~ pressure relief valve is used, the additional valve(s) may be set within a range not to exceed 110% over of the set pressure of the first valve.
- c) The required relieving capacity ~~in Btu/hr (W)~~ of the ~~temperature and~~ pressure relief valve

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in Btu/hr (W) shall not be less than the maximum ~~allowable rated heat~~ input unless the rated burner input capacity ~~the water heater~~ is marked on the water heater casing in a readily visible location. ~~with the rated burner input capacity of the water heater on the casing in a readily visible location,~~ in which this case, the rated burner input capacity may be used as a basis for sizing the temperature pressure relief valves. The relieving capacity for electric water heaters shall be 3,500 Btu/hr (1.0 kW) per kW of input. In every case, ~~the following requirements shall be met.~~ Temperature and pPressure relief valve capacity for each water heater shall be such that, with the fuel burning equipment installed and operated at maximum capacity, the pressure cannot ~~rise more than~~exceed 110% above of 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 Canadian Standards Association (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.

- d) If operating conditions are changed or additional heating surface is installed, the ~~temperature and~~ pressure relief valve capacity shall be increased, if necessary, to meet the new conditions and shall be in accordance with the above provisions. In no case shall the increased input capacity exceed the maximum allowable input capacity. ~~The~~ Any additional valves required, ~~on account of resulting from~~ changed conditions, may be installed on the outlet piping provided ed there is no intervening valve.

4.2.2 CONSTRUCTION STANDARDS FOR THE REPAIR OF PRESSURE RELIEF DEVICES

For the repair of pressure relief devices, the following construction standards shall apply:

- a) The applicable new construction standard to be used for reference during repairs shall be the original code of construction. is the ASME Code.
- b) Applicable ASME Code Cases shall be used for reference during repairs when:
 - 1) The device complies with an ASME Code Case or, they were used in the original construction of the valve.
 - 2) The device undergoes a conversion to comply with an ASME Code Case. 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 device that complies with an ASME Code Case may be converted to comply with the original code of construction.

For pressure relief devices repaired per 4.2.2 b)1 or converted per 4.2.2 b)2, the ASME Code Case number shall be noted on the repair document and, when required by the code case, stamped on the repair nameplate.

A device that complies with an ASME Code Case may be converted to comply with the original code of construction.

For pressure relief devices converted to the original code of construction, the ASME Code Case number shall be noted on the repair document but shall not be stamped on the repair nameplate. References to that ASME Code Case shall be marked out but left legible on the original nameplate.

b) The Jurisdiction where the pressure retaining item is installed shall be consulted for any unique requirements it may have established including construction standards and ASME Code Cases.

Item Number: 23-31	NBIC Location: Part 4, 3.2.5 d) 5) and Part 2, 2.5.7 d) 5)	No Attachment
General Description: Testing of liquid service valves to be water or other suitable liquid		
Subgroup: PRD		
Task Group: P. Dhobi (PM), K. Beise, T. Tarbay, T. Patel, H. Cornett, D. Marek		
<i>Explanation of Need: The intent is that liquid service valves be tested on liquid. The term fluid can mean either liquid or vapor.</i>		
July 2023 Meeting Action: A task group was assigned		

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

- a) Pressure relief devices shall be subject to periodic inspection and/or testing based upon the type of device.
- b) The owner may perform testing on the unit wherever the valve is installed, or testing may be performed 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 to have available a written procedure 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 is performed at a test facility, the record of this test should be reviewed to ensure the device meets the requirements of the original code of construction. Devices which have been in toxic, flammable, or other hazardous services shall be carefully decontaminated before being tested. In particular, the closed bonnet of valves in these services may contain fluids that are not easily removed or neutralized. If a test cannot be safely performed, the device shall be disassembled, cleaned, decontaminated, repaired, and reset.
 - 3) If a device has been removed for testing, the inlet and outlet connections should be checked for blockage by product buildup or corrosion.

3.2.5.1 TESTING AND OPERATIONAL INSPECTION OF PRESSURE RELIEF VALVES

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

- a) Pressure relief valves shall be tested periodically to ensure that they are free to operate and will operate in accordance with the requirements of the original code of construction. Testing should include device set or opening pressure, reclosing pressure (where applicable), and seat leakage evaluation. Tolerances for these operating requirements specified in the original code of construction shall be used to determine the acceptability of test results.
- b) Valves may be tested using lift assist devices when testing at full pressure may cause damage to the valve being tested or when it is impractical to test at full pressure due to system design considerations. Lift assist devices apply an auxiliary load to the valve spindle or stem, and using the measured inlet pressure, applied load and other valve data allow the set pressure to be calculated. If a lift assist device is used to determine valve set pressure, the conditions of 4.6.3 shall be met. It should be noted that

false set pressure readings may be obtained for valves which are leaking excessively or otherwise damaged.

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

- 1) High pressure boiler pressure relief valves, high temperature hot-water boiler pressure relief valves, low pressure steam heating boilers: steam;
- 2) Hot-water heating boiler pressure relief valves: steam, air, or water;
- 3) Hot water heater temperature and pressure relief valves: air or water;
- 4) Air and gas service process pressure relief valves: air, nitrogen, or other suitable gas;
- 5) Liquid service process pressure relief valves: water or other suitable ~~fluid~~liquid; and
- 6) Process steam service pressure relief valves: steam or air with manufacturer's steam to air correction factor.

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

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

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

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

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

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

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

- a) Periodic set point testing is not required since pins or bars are single use.
- b) Periodic inspection shall be per 3.2.4.4.
- c) The owner shall periodically inspect the non-reclosing PRDs for freedom of motion inspection frequency shall be per 3.2.6.
 - 1) Remove pressure from the PRD, or remove the PRD from service, prior to performing this check.
 - 2) Remove the pin or bar.
 - 3) Manually exercise the sealing mechanism to ensure it is capable of its full range of motion.
 - 4) Reinstall the pin or bar or replace with new. Replacement pin or bar shall be per manufacturer recommendations.
 - 5) Restore pressure to the PRD.

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

3.2.5.3 TESTING AND OPERATIONAL INSPECTION OF RUPTURE DISKS

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

- a) Periodic testing of rupture disks is not required
- b) Rupture disks shall be subject to periodic inspection per 3.2.4.4.
- c) The owner may elect to have a rupture disks tested periodically in order to determine service life. Such

tests should ensure that the disk is free to operate inside its holder and will operate in accordance with the requirements of the Original Code of Construction. Testing should include an evaluation of leakage through the disk (e.g. due to cracks or porosity), followed by device opening or burst pressure at rated temperature. Tolerances specified for these operating requirements in the Original Code of Construction should be used to determine the acceptability of test results.

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

- 1) Air and gas service PRDs: air, nitrogen, or other suitable gas;
- 2) Liquid service PRDs: water or other suitable liquid.

3.2.5.4 CORRECTIVE ACTION

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

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

3.2.5.5 VALVE ADJUSTMENTS

a) If a set pressure test indicates the valve does not open within the requirements of the original code of construction, but otherwise is in acceptable condition, minor adjustments (defined as no more than twice the permitted set pressure tolerance) shall be made by a "VR" or "T/O" Certificate Holder to reset the valve to the correct opening pressure. All adjustments shall be resealed with a seal identifying the responsible organization and a tag shall be installed identifying the organization and the date of the adjustment.

b) If a major adjustment is needed, this may indicate the valve is in need of repair or has damaged or mis-applied parts. Its condition should be investigated accordingly.

Section 2: 2.5.7.1 TESTING AND OPERATIONAL INSPECTION OF PRESSURE RELIEF VALVES

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

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

b) Valves may be tested using lift assist devices when testing at full pressure may cause damage to the valve being tested or when 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 NBIC Part 4, 4.6.3 shall be met. It should be noted that false set pressure readings may be obtained for valves which are leaking excessively or otherwise damaged.

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

- 1) High-pressure boiler pressure relief valves, high-temperature hot-water boiler pressure relief valves, low-pressure steam heating boilers: steam;
- 2) Hot-water heating boiler pressure relief valves: steam, air, or water;
- 3) Hot-water heater temperature and pressure relief valves: air or water;
- 4) Air and gas service process pressure relief valves: air, nitrogen, or other suitable gas; ~~and~~
- 5) Liquid service process pressure relief valves: water or other suitable liquid; and
- 5) Process steam service pressure relief valves: steam or air with manufacturer's steam to air correction factor.

Note: Valves being tested after a repair must be tested on steam except as permitted by NBIC Part 4, 4.6.2.

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

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

e) Systems with multiple valves will require the lower set valves to be held closed to permit the higher set valves to be tested. A test clamp or "gag" should be used for this purpose. The spring compression

screw shall not be tightened. It is recommended that when the valve is at or near the test temperature, the test clamps are applied in accordance with the valve manufacturer's instructions; application should be hand-tight only to avoid damage to the valve stem or spindle.

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

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

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

- a) Periodic set point testing is not required since pins or bars are single use.
- b) Periodic inspection shall be per 2.5.5.4.
- c) The owner shall periodically inspect non-reclosing PRDs for freedom of motion. Freedom of motion inspection frequency shall be per 2.5.5.4.
 - 1) Remove pressure from the PRD, or remove the PRD from service, prior to performing this check.
 - 2) Remove the pin or bar.
 - 3) Manually exercise the sealing mechanism to ensure it is capable of its full range of motion.
 - 4) Reinstall the pin or bar or replace with new. Replacement pin or bar shall be per manufacturer's recommendations.
 - 5) Restore pressure to the PRD.
- 6) The PRD should be checked for seat leakage following restoration of pressure.

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

2.5.7.3 TESTING AND OPERATIONAL INSPECTION OF RUPTURE DISKS

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

- a) Periodic testing of rupture disks is not required,
- b) Rupture disks shall be subject to periodic inspection per 2.5.5.4.
- c) The owner may elect to have a rupture disks tested periodically in order to determine service life. Such

tests should ensure that the disk is free to operate inside its holder and will operate in accordance with the requirements of the original code of construction. Testing should include an evaluation of leakage through the disk (e.g., due to cracks or porosity), followed by device opening or burst pressure at rated temperature. Tolerances for these operating requirements specified in the original code of construction should be used to determine the acceptability of test results.

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

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

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



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