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

**NATIONAL BOARD
SUBGROUP
PRESSURE RELIEF DEVICES**

MINUTES

Meeting of July 13, 2021
Cincinnati, OH

The National Board of Boiler & Pressure Vessel Inspectors
1055 Crupper Avenue
Columbus, Ohio 43229-1183
Phone: (614)888-8320
FAX: (614)847-1828

1. Call to Order

The meeting was called to order at 8:05 AM on Tuesday July 1, 2021 by Chair Kim Beise. Members and Visitors in attendance can be found on the attendance sheet (Attachments Page 1).

2. Announcements

- The National Board will host a reception for all committee members and visitors on Wednesday evening from 5:30pm – 7:30 pm in the Continental Room on the Mezzanine Level.
- The National Board will host a breakfast for all committee members and visitors on Thursday morning at 7:00 am and a lunch at 11:30 am in the Rosewood room on the 4th floor of the Hotel.
- A coffee station with snacks will be provided in the morning and afternoon outside of the meeting rooms on the 3rd and 4th floors.
- The 2021 NBIC is available as of July 1st, 2021.

3. Adoption of the Agenda

The July 2021 agenda was presented. A motion was made and seconded to adopt the agenda. A vote was taken and the motion was unanimously approved.

4. Approval of Minutes from the January 11, 2020 Meeting

A motion was made and seconded and seconded to approve the January 2021 minutes. A vote was taken and the motion was unanimously approved.

5. Review of the Roster

a. Nominations

b. Reappointments

c. Resignations

6. Action Items

Item Number: NB15-0305	NBIC Location: Part 4	See Attachments pages 2-3
General Description: Create Guidelines for Installation of Overpressure Protection by System Design.		
Task Group: B. Nutter, A. Renaldo, D. Marek (PM), D. DeMichael, J. Wolf, D. Schirmer		
Passed SG letter ballot. Since this proposal affects Parts 1 and 2, SG/SC Installation and Inspection will be letter balloted between meetings. Prior to proceeding with SC PRD and Main Committee letter ballots.		

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		
Item was letter balloted to SG between meetings and received a couple of negatives and comments. Task group will respond to the comments and revise proposal accordingly.		

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		
Work continues on this item. Possible letter ballot to SG between meetings.		

Item Number: 17-115	NBIC Location: Part 4, Section 2	No Attachment
General Description: Complete rewrite of Section 2 combining common requirements into a general requirements section for all pressure relief devices and look at combining with 2.4.3, 2.4.4.		
Task Group: A. Renaldo (PM), D. McHugh, D. Marek		
A motion was made and seconded to close this item with no action. After discussion, the motion unanimously passed. Rationale was that scope of item was too large and will most likely better proceed with smaller action items to be opened at a later date.		

Item Number: 17-119	NBIC Location: Part 4, 2.2.5 and Part 1, 2.9.1.4	No Attachment
General Description: States pressure setting may exceed 10% range. Clarify by how much.		
Task Group: T. Patel (PM), D. Marek, J. Ball, R. Donaldson		
Work continues on this item. Item maybe reopened in ASME.		

Item Number: 19-1	NBIC Location: Part 4, 4.8.5.4 & 4.8.6.1	No Attachment
General Description: Develop specific content and scope of annual field audits.		
Task Group: A. Donaldson (PM), D. Marek, A. Cox, P. Dhobi, M. Brodeur, T. Patel, D. DeMichael		
A motion was made and seconded to close the item with no action and combine with Item 21-05. After discussion a vote was taken and the motion unanimously passed.		

Item Number: 19-37	NBIC Location: Part 4, 4.3.1 c) 4)	No Attachment
General Description: Origin of Replacement Parts for Pressure Relief Devices		
Task Group: A. Cox (PM), T. Patel, P. Dhobi, J. Simms		
Work continues on this item. Should have proposal ready for letter ballot between meetings.		

Item Number: 19-71	NBIC Location: Part 4, 4.9.2 & 4.9.3	See attachments pages 4-7
General Description: Use of Personnel from another VR Certificate Holder to perform VR Repairs.		
Task Group: A. Donaldson (PM), A. Cox, B. Donaldson, D. Marek, J. Simms		
This item passed SG/SC letter ballot between meetings and will be sent to Main Committee for letter ballot.		

Item Number: 19-83	NBIC Location: Part 4, Part 1	See attachments pages 8-12
General Description: Address alternate pressure relief valve mounting permitted by ASME CC2887-1.		
Task Group: D. Marek (PM), T. Patel, J. Ball		
This item passed SC letter ballot, but did not receive enough votes from SG/SC Installation. Installation to look at/comment on item this meeting. If changes are necessary, it will be brought back. If no changes, item to be sent to Main Committee for letter ballot.		

Item Number: 19-85	NBIC Location: Part 4, 2.3.6 j)	No Attachment
General Description: Thermal fluid heaters with no change of phase are not specifically addressed in 2.3.6 j).		
Task Group: T. Patel (PM), B. Nutter		
A motion was made and seconded to close this item with no action. After discussion a vote was taken and motion unanimously passed. Rationale was that the need for this item was resolved by a revision published in the 2021 edition of the NBIC.		

Item Number: 20-56	NBIC Location: Part 4, 3.4	See Attachments pages 13-14
General Description: Review and clarify requirements training program for T/O holders		
Subgroup: PRD		
Task Group: A. Donaldson (PM), A. Cox, B. Donaldson, D. Marek, J. Simms, P. Dhobi, D. McHugh		
A motion was made and seconded to accept the attached proposal. After discussion a vote was taken and the motion unanimously passed. This will be forwarded to SC PRD for consideration.		

7. New Business

Item Number: 20-85	NBIC Location: Part 4, 3.2.6	No attachment
General Description: Add language to Part 4, 3.2.6 to define test intervals for thermal fluid heaters for PRD's		
Subgroup: PRD		
Task Group: B. Nutter (PM), T. Patel, D. Schirmer, J. Wolf		
Explanation of Need: Need to align Part 4 language with work done under Item 19-88.		
A task group was formed to work on this item.		

Item Number: 21-04	NBIC Location: Part 4, 3.3	No attachment
General Description: Test Only (T/O) Annual Training Review		
Subgroup: PRD		
Task Group: None assigned.		
Explanation of Need: An Annual Review of Qualification has been a requirement of the VR Program for over 20 years. It has provided assurance that the Certificate Holder's Personnel are able to properly perform the activities required to maintain the reliability of In-Service Pressure Relief Devices to the Standards established by NBIC. It will serve to verify the Certificate Holder's Personnel are able to properly perform required activities accurately and safely. This is necessary to maintain the NBIC Standards for the protection of the public.		
A motion was made and seconded to close this item with no action. After discussion a vote was taken and the motion unanimously passed. Rationale was that this item was handled under item 20-56.		

Item Number: 21-05	NBIC Location: Part 4, 3.3 and 4.8	No attachment
<p>General Description: Develop specific requirements for Shop and Field Audits for VR & T/O Certificate Holders</p> <p>Subgroup: PRD Task Group: A. Donaldson (PM), A. Cox, J. Simms, P. Dhobi, T. Tarbay, D. Marek</p> <p>Explanation of Need: There has long been a requirement for an Annual Audit of Field Activities for VR and, more recently, T/O Activities. This same opportunity for improvement should be extended to Shop Activities that involve for T/O or VR Repair, as applicable, are properly performed and documented.</p> <p>A task group was formed to work on this item. Item General Description revised to include scope of 19-1.</p>		

Item Number: 21-08	NBIC Location: Part 4, S4.4	No attachment
<p>General Description: Additional guidance for tank vent repairs</p> <p>Subgroup: PRD Task Group: D. DeMichael (PM), B. Donaldson, B. Nutter, K. Beise, J. Grace</p> <p>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.</p> <p>A task group was formed to work on this item.</p>		

Item Number: 21-16	NBIC Location: Part 4, 4.8.5.4 i)3)	See attachments page 15
<p>General Description: Verification of Pressure Relief Valve Spring During VR Repair Activities</p> <p>Subgroup: PRD Task Group: None assigned.</p> <p>Explanation of Need: The existing requirement requires the replacement of original springs when the spring chart is revised if the Manufacturer is unable or unwilling to provide verification for the original spring.</p> <p>A motion was made and seconded to close this item with no action and provide inquirer attached rationale for closing the item. After discussion a vote was taken and the motion unanimously passed.</p>		

Item Number: 21-18	NBIC Location: Part 4, 4.6.4	No attachment
General Description: Pressure tests for pressure relief valve parts.		
Subgroup: PRD		
Task Group: J. Simms (PM), T. Tarbay, A. Donaldson, D. DeMichael, T. Patel, B. Nutter		
Explanation of Need: Pressure relief valve manufacturers must produce valve parts that comply with ASME Code requirements to be able to apply the ASME Symbol Stamp and Designator to a new valve. These parts are the same that are sold as repair parts. The logistic issues to fabricate and maintain an inventory of spare parts not complying with ASME Code requirements is significant versus producing all parts in compliance with code. Consequently, why have a pressure test requirement for parts purchased from the valve manufacturer for those certificate holders who chose to buy parts produced by the manufacturer?		
A task group was formed to work on this item.		

8. Presentations

There were no presentations made at this meeting.

9. Future Meetings

January 17th-21th, 2022 – San Diego, CA

July 2022 -- TBD

10. Adjournment

A motion was made, seconded, voted on, and unanimously passed to adjourn the meeting at approximately 11:45 AM

Respectfully Submitted,

Thomas P. Beirne, P.E.
 Secretary, NBIC Subgroup Pressure Relief Devices
 pc: J. Amato
 B. Weilgozinski
 J. Ellis

NB15-0305

PART 1

4.5 ~~PRESSURE RELIEF DEVICES~~ OVERPRESSURE PROTECTION

See NBIC Part 1, 4.1 for the scope of pressure vessels covered by these requirements.

~~Pressure relief devices protecting pressure vessels shall meet the following requirements. When overpressure protection is provided by a pressure relief device or devices, the requirements in 4.5.1 through 4.5.6 apply. If overpressure protection is provided by Overpressure Protection by System Design in lieu of a pressure relief device or devices, the requirements in 4.5.7 apply.~~

4.5.7 OVERPRESSURE PROTECTION BY SYSTEM DESIGN

See NBIC Part 4, 2.5.8.

PART 2

2.3.5 INSPECTION OF PRESSURE VESSEL PARTS AND APPURTENANCES

2.3.5.2 SAFETY DEVICES

See NBIC Part 2, 2.5 for the inspection of safety devices (pressure relief valves and non-closing devices such as rupture disks) and NBIC Part 2, 2.6 for Overpressure Protection by System Design in lieu of a pressure relief device or devices used to prevent the overpressure of pressure vessels.

2.6 OVERPRESSURE PROTECTION BY SYSTEM DESIGN

See NBIC Part 4, 2.5.8.

PART 4

2.5 PRESSURE VESSEL ~~PRESSURE RELIEF DEVICES~~ OVERPRESSURE PROTECTION

See NBIC Part 1, 4.1 for the scope of pressure vessels covered by the requirements of Part 4, 2.5.

~~When overpressure protection is provided by a pressure relief device or devices the requirements in 2.5.1 through 2.5.7 apply. If overpressure protection is provided by Overpressure Protection by System Design in lieu of a pressure relief device or devices, then the requirements in 2.5.8 apply. Pressure relief devices protecting pressure vessels shall meet the following requirements:~~

2.5.8 OVERPRESSURE PROTECTION BY SYSTEM DESIGN

Overpressure protection by system design may be used in lieu of a pressure relief device or devices if permitted by the Jurisdiction and the applicable Section of the ASME BPV Code. Compliance with the pressure vessel code requirements shall be documented in a report that includes as a minimum:

- a) For pressure vessels for which the pressure is self-limiting
 - 1) The signature of the individual in responsible charge of the management of the operation of the vessel
 - 2) Detailed process and instrument flow diagrams, showing all pertinent elements of the system associated with the vessel
 - 3) A description of all operating and upset scenarios, including scenarios involving fire and those that result from operator error, and equipment and/or instrumentation malfunctions

- 4) An analysis showing the maximum coincident pressure and temperature that can result from each of the scenarios listed in item 3) above does not exceed the MAWP at that temperature
 - 5) For a new vessel, a copy of the vessel's Manufacturer's data report stating that overpressure protection is provided by system design
 - 6) For an existing vessel whose Manufacturer's data report does not state overpressure by system design, a copy of the Manufacturer's data report with an attachment signed by the user indicating that overpressure protection is being provided by system design.
- b) For pressure vessels for which the pressure is not self-limiting
- 1) The signature of the individual in responsible charge of the management of the operation of the vessel
 - 2) Detailed process and instrument flow diagrams (P&IDs), showing all pertinent elements of the system associated with the vessel
 - 3) A description of all operating and upset scenarios, including those involving fire and those that result from operator error, and equipment and/or instrumentation malfunctions
 - 4) A detailed description of any safety critical instrumentation used to limit the system pressure, including the identification of all truly independent redundancies and a reliability evaluation (qualitative or quantitative) of the overall safety system
 - 5) An analysis showing the maximum pressure that can result from each of the scenarios
 - 6) For a new vessel, a copy of the vessel's Manufacturer's data report stating that overpressure protection is provided by system design
 - 7) For an existing vessel whose Manufacturer's data report does not state overpressure by system design, a copy of the Manufacturer's data report with an attachment signed by the user indicating that overpressure protection is being provided by system design.

ITEM 19-71 1-12-21**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) ~~Technicians qualified by Qualified technicians in the employ of~~ the Certificate Holder ~~in accordance with 4.9.2~~ perform such repairs;

Commented [DA1]: First Change included in Item 19-71

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.

4.8.6.2 USE OF OWNER OR USER PERSONNEL

~~For the repair of pressure relief valves 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 COMPETENCY, TRAINING AND QUALIFICATION OF PERSONNEL**4.9.1 COMPETENCY OF PERSONNEL**

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

4.9.2 CONTENTS OF TRAINING PROGRAM

The repair organization shall establish a documented training program to ensure the defined skills, knowledge and competencies are achieved. As a minimum, training objectives for each position shall include:

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

4.9.3 INITIAL EVALUATION AND ACCEPTANCE OF PERSONNEL

The repair organization shall complete an initial evaluation and acceptance of each individual's skills and competency prior to the individual being assigned to work without direct supervision. This evaluation and acceptance shall be documented.

4.9.4 ANNUAL EVALUATION AND ACCEPTANCE OF PERSONNEL

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

4.10 Use of Personnel not in the Certificate Holder's employ

The repair organization may use the services of personnel not in their employ to assist the Certificate Holder in the performance of repairs provided:

- a) The use of such personnel is addressed in the "VR" Certificate Holder's quality system
- b) The personnel are qualified in accordance with 4.9.2. Records of this qualification are to be retained in accordance with 4.8.5.4 (s)
- c) The personnel work under direct supervision and control of the "VR" Certificate Holder
- d) The "VR" Certificate Holder shall have the authority to assign and remove personnel at its own discretion
- e) The names of the personnel utilized are recorded on the documents as required by the quality system

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 1.6.1	Refer to Part 3, Table 1.6.1
Record of repair or inspection	The repair and inspection program	5 years

	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.	
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 termination of employment.
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 valve 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.
Records of personnel not in the certificates holder's employ training and qualification.	The repair organization may use the services of personnel not in their employ to assist the Certificate Holder in the performance of repairs provided they meet the requirements of Section 4.10. Each repair organization shall document the evaluation and acceptance of an individual's qualification for the applicable position.	5 years after completion of work performed by individual not in the certificate holder's employee.

ITEM 19-83 Proposal 1/7/21

NBIC PART 1

3.9 PRESSURE RELIEF VALVES

See NBIC Part 1, 3.2 for the scope of pressure retaining items covered by these requirements.

3.9.1 PRESSURE RELIEF VALVE REQUIREMENTS – GENERAL

The following general requirements pertain to installing, mounting, and connecting pressure relief valves on heating boilers.

3.9.1.1 INSTALLATION OF PRESSURE RELIEF VALVES FOR STEAM HEATING, HOTWATER HEATING, AND HOT-WATER SUPPLY BOILERS

3.9.1.1.1 PERMISSIBLE INSTALLATION

Pressure relief valves shall be located at the top side of the boiler. The top side of the boiler shall mean the highest practicable part of the boiler proper but in no case shall the safety valves be located below the normal operating level and in no case shall the pressure relief valve be located below the lowest permissible water level. They shall be connected directly to a tapped or flanged opening in the boiler, to a fitting connected to the boiler by a short nipple, to a Y-base, or to a valveless header connecting steam or water outlets on the same boiler. Coil or header type boilers shall have the pressure relief valve located on the steam or hot-water outlet end. Pressure relief valves shall be installed with their spindles vertical. The opening or connection between the boiler and any pressure relief valve shall have at least the area of the valve inlet.

- a) For a Low Mass Watertube boiler of 10 gallons or less, the pressure relief valve may be installed below the boiler provided:
 - 1) A UL-353 certified flow sensing device is installed to automatically cut off the fuel supply if circulation through the boiler is interrupted;
 - 2) The pressure relief valve is installed with the spindle in the vertical position;
 - 3) The opening or connection between the boiler and the pressure relief valve shall have an area at least equal to the nominal inside area of a Schedule 80 pipe (as defined by ASME B36.10) and of the same nominal pipe size as the inlet of the valve.

3.9.4 PRESSURE RELIEF VALVE REQUIREMENTS FOR POTABLE WATER HEATERS

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

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 valves, pumps, expansion or storage tanks, or piping) have a 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 10% over the set pressure of the first valve.

c) The required relieving capacity in Btu/hr (W) of the temperature and 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 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 pressure 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 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 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 additional valves required, on account of changed conditions, may be installed on the outlet piping providing there is no intervening valve.

3.9.4.1 INSTALLATION

Temperature and pressure relief valves shall be installed by either the water heater manufacturer or installer before a water heater is placed in operation.

3.9.4.2 PERMISSIBLE INSTALLATIONS

Temperature and pressure relief valves shall be connected directly to a tapped or flanged opening in the top of the water heater or to a fitting connected to the water heater by a short nipple. Temperature and pressure relief valves shall be installed with their spindles upright and vertical with no horizontal connecting pipe, except that, when the temperature and pressure relief valve is installed directly on the water heater vessel 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. The center line of the temperature and pressure relief valve connection shall be no lower than 4 in. (100 mm) from the top of the shell. No piping or fitting used to install the temperature and pressure relief valve shall be of nominal pipe size less than that of the valve inlet.

a) For a Low Mass Watertube boiler of 10 gallons or less, the pressure relief valve may be installed below the boiler provided:

1) A UL-353 certified flow sensing device is installed to automatically cut off the fuel supply if circulation through the boiler is interrupted;

2) The pressure relief valve is installed with the spindle in the vertical position;

3) The opening or connection between the boiler and the pressure relief valve shall have an area at least equal to the nominal inside area of a Schedule 80 pipe (as defined by ASME B36.10) and of the same nominal pipe size as the inlet of the valve.

NBIC PART 4**2.4 PRESSURE RELIEF VALVES FOR STEAM HEATING, HOT WATER HEATING, AND HOT WATER SUPPLY BOILERS**

See NBIC Part 1, 3.2 for the scope of pressure retaining items covered by Part 4, 2.4.

2.4.1 GENERAL REQUIREMENTS

The following general requirements pertain to the installation of pressure relief valves on heating boilers.

2.4.1.1 INSTALLATION OF PRESSURE RELIEF VALVES FOR HEATING BOILERS**2.4.1.1.1 PERMISSIBLE INSTALLATION**

Pressure relief valves shall be located at the top side of the boiler. The top side of the boiler shall mean the highest practicable part of the boiler proper but in no case shall the safety valves be located below the normal operating level and in no case shall the pressure relief valve be located below the lowest permissible water level. They shall be connected directly to a tapped or flanged opening in the boiler, to a fitting connected to the boiler by a short nipple, to a Y-base, or to a valveless header connecting steam or water outlets on the same boiler. Coil or header type boilers shall have the pressure relief valve located on the steam or hot-water outlet end. Pressure relief valves shall be installed with their spindles vertical. The opening or connection between the boiler and any pressure relief valve shall have at least the area of the valve inlet.

- a) For a Low Mass Watertube boiler of 10 gallons or less, the pressure relief valve may be installed below the boiler provided:
 - 1) A UL-353 certified flow sensing device is installed to automatically cut off the fuel supply if circulation through the boiler is interrupted;
 - 2) The pressure relief valve is installed with the spindle in the vertical position;
 - 3) The opening or connection between the boiler and the pressure relief valve shall have an area at least equal to the nominal inside area of a Schedule 80 pipe (as defined by ASME B36.10) and of the same nominal pipe size as the inlet of the valve.

2.4.4 PRESSURE RELIEF VALVE REQUIREMENTS FOR POTABLE WATER HEATERS

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

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 valves, pumps, expansion or storage tanks, or piping) have a 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 10% over the set pressure of the first valve.

c) The required relieving capacity in Btu/hr (W) of the temperature and 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 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 pressure 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 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 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 additional valves required, on account of changed conditions, may be installed on the outlet piping providing there is no intervening valve.

2.4.4.1 INSTALLATION

Temperature and pressure relief valves shall be installed by either the water heater manufacturer or installer before a water heater is placed in operation.

2.4.4.2 PERMISSIBLE INSTALLATIONS

Temperature and pressure relief valves shall be connected directly to a tapped or flanged opening in the top of the water heater or to a fitting connected to the water heater by a short nipple. Temperature and pressure relief valves shall be installed with their spindles upright and vertical with no horizontal connecting pipe, except that, when the temperature and pressure relief valve is installed directly on the water heater vessel 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. The center line of the temperature and pressure relief valve connection shall be no lower than 4 in. (100 mm) from the top of the shell. No piping or fitting used to install the temperature and pressure relief valve shall be of nominal pipe size less than that of the valve inlet.

a) For a Low Mass Watertube boiler of 10 gallons or less, the pressure relief valve may be installed below the boiler provided:

1) A UL-353 certified flow sensing device is installed to automatically cut off the fuel supply if circulation through the boiler is interrupted;

2) The pressure relief valve is installed with the spindle in the vertical position;

3) The opening or connection between the boiler and the pressure relief valve shall have an area at least equal to the nominal inside area of a Schedule 80 pipe (as defined by ASME B36.10) and of the same nominal pipe size as the inlet of the valve.

NBIC ITEM NO: 19-83

SCOPE: ADDRESS ALTERNATE
PRV MOUNTING PERMITTED BY
ASME CC 2887-1.

ASME BPVC.CC.BPV-2019

Approval Date: December 12, 2017

Code Cases will remain available for use until annulled by the applicable Standards Committee.

Case 2887-1
Alternate Safety Relief Valve Mounting for Low Mass
Watertube Boilers and Water Heaters
Section IV

Inquiry: Under what conditions may safety relief valves be mounted below a low mass watertube boiler or water heater?

Reply: It is the opinion of the Committee that safety relief valves may be mounted below a low mass watertube boiler or water heater, provided the following requirements are met:

(a) Water volume shall be 10 gal (38 L) or less.

(b) A UL-353 certified flow sensing device shall be installed to automatically cut off the fuel supply if circulation through the boiler is interrupted.

(c) The safety relief valve inlet piping is connected to a vertical section of the hot water outlet piping (see [Figure 1](#)).

(d) Safety relief valves shall be installed with their spindles vertical.

(e) The opening or connection between the boiler and any safety relief valve shall have an area at least equal to the nominal inside area of a Schedule 80 pipe (as defined by ASME B36.10) and of the same nominal pipe size as the inlet of the valve.

(f) All other requirements of Section IV shall be met.

(g) This Case number shall be recorded on the Manufacturer's Data Report.

The Committee's function is to establish rules of safety, relating only to pressure integrity, governing the construction of boilers, pressure vessels, transport tanks and nuclear components, and inservice inspection for pressure integrity of nuclear components and transport tanks, and to interpret these rules when questions arise regarding their intent. This Code does not address other safety issues relating to the construction of boilers, pressure vessels, transport tanks and nuclear components, and the inservice inspection of nuclear components and transport tanks. The user of the Code should refer to other pertinent codes, standards, laws, regulations or other relevant documents.

TASK GROUP:
D. MAREK (ch)
T. PATEL, J. BALL

Item 20-56

3.3.5 3.4 COMPETENCY, TRAINING AND QUALIFICATION OF PERSONNEL**3.3.5.1 COMPETENCY OF PERSONNEL**

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

3.3.5.2 3.4.1 CONTENTS OF TRAINING PROGRAM

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

- a) Applicable ASME Code ~~and NBIC~~ requirements;
- a)b) Applicable NBIC requirements
- b)c) Individual rResponsibilities of each function described within the organization's quality system; ~~and~~
- e)d) Knowledge of the Ttechnical aspects for the applicable position held: ~~and mechanical skills for making set pressure and/or blowdown adjustments to pressure relief valves;~~
- d)e) Knowledge of the technical aspects and Mmechanical skills for applicable position held. ~~marking and sealing of pressure relief valve adjustments.~~

3.3.5.3 INITIAL EVALUATION AND ACCEPTANCE OF PERSONNEL

The test organization shall complete an initial evaluation and acceptance of each individual's skills and competency prior to the individual being assigned to work without direct supervision. This evaluation and acceptance shall be documented.

3.3.5.4 ANNUAL EVALUATION AND ACCEPTANCE OF PERSONNEL

The test organization shall complete an annual evaluation and acceptance of each individual's skills and competency to verify proficiency as well as compliance with the Certificate Holder's quality system. This evaluation shall include training records, documented evidence of work performed and on-the-job observations to demonstrate competency. The evaluation shall be documented.

Item 21-16.

Rationale for closing with no action.

Sometimes manufacturers modify design characteristics which may require spring ranges for different size and pressure combinations to be revised. This requirement was established to ensure the proper spring is used in the repair. Only the manufacturer can determine the reason for the change and if the spring currently installed in the valve is acceptable.