



THE NATIONAL BOARD  
OF BOILER AND PRESSURE VESSEL INSPECTORS

# NATIONAL BOARD INSPECTION CODE SUBCOMMITTEE INSTALLATION

## MINUTES

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Meeting of January 19, 2022  
San Diego, CA

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The National Board of Boiler & Pressure Vessel Inspectors  
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## 1. Call to Order

Subcommittee Chair Ms. Wadkinson called the meeting to order at 8:00 a.m. (PST).

## 2. Introduction of Members and Visitors

Ms. Vance gave an introduction of members and visitors. Everyone stated their name and interest category/company. All remote attendees (both members and visitors) introduced themselves with their name and interest category/company. The members and visitors are listed on the attendance sheet (**Attachment Page 1**). Ms. Kimberly Gates (with Authorized Inspection Associates, LLC) sat as an alternate for Mr. Rex Smith.

## 3. Check for a Quorum

With 12 out of 13 members present (in person and remotely), a quorum was met.

## 4. Awards/Special Recognition

There were no awards or special recognitions for this meeting.

## 5. Announcements

Ms. Vance gave the announcements:

- This will be Ms. Jeanne Bock's last meeting as Secretary for Subgroup and Subcommittee Installation, as she has accepted a new position at the National Board. Ms. Michelle Vance will be taking over as Secretary for both committees.
- The National Board will be hosting a reception on Wednesday evening from 5:30pm to 7:30pm at The Smoking Gun. Information for the Smoking Gun can be found on the National Board website under the **Inspection Code** tab → NBIC Meeting Information.
- The National Board will be hosting a breakfast and lunch for the Main Committee meeting on Thursday. Breakfast will be served from 7:00am to 8:00am, and lunch will be served from 11:30am to 12:30pm. Both meals will be served at the hotel in Le Fontainebleau. Members, visitors, and guests are all welcome. **Please register if you have not already done so.**
- A coffee station will be provided outside of the meeting rooms on each floor.
- The password for the Cloud has been updated. See the email from the NBIC Secretary.
- Thank you to everyone who registered online for this meeting. The online registration is very helpful for planning our reception, meals, the room set up, etc.
- Ms. Wadkinson stated that she would have to leave the meeting prematurely, and that at that time Mr. Wiggins would act as Chair for the remainder of the meeting.

## 6. Adoption of the Agenda

Prior to the adoption of the agenda, the group briefly discussed the following:

Mr. Gene Tompkins would like to be considered for Subcommittee membership. Ms. Melissa Wadkinson is stepping down as Chair for Subcommittee Installation, as she has been appointed Main Committee Vice Chair. We will need to recommend a new Chair for Subcommittee.

There were no other Agenda revisions. With that, there was a motion to adopt the agenda as revised, which was both seconded and unanimously approved.

## **7. Approval of the Minutes of the July 14<sup>th</sup>, 2021 Meeting**

A motion to approve the Minutes from the July 14, 2021 Subcommittee meeting was made, seconded, and unanimously approved.

## **8. Review of Rosters (Attachment Page 1)**

### **a. Membership Nominations**

**Mr. Gene Tompkins** (Manufacturers) has applied for Subcommittee membership. Mr. Tompkins briefly spoke about what he could contribute to the Subcommittee. Then he left the room briefly for the Subcommittee to discuss. There was a motion to recommend Mr. Tompkins as a Subcommittee member, which was seconded and unanimously approved.

**Mr. Tom Clark** (Jurisdiction) has been nominated for Subcommittee membership. Mr. Clark left the room briefly, and a motion was made, seconded, and unanimously approved to recommend Mr. Clark for Subcommittee membership.

### **b. Membership Reappointments**

**Mr. William Anderson** and **Mr. Ron Spiker** have memberships to the Subgroup that are set to expire before the July 2022 NBIC meetings.

Mr. Spiker logged off Zoom momentarily so the Subcommittee could vote. A motion was made, seconded, unanimously approved to reappoint Mr. Spiker for membership in the Subgroup.

Mr. William Anderson was not in attendance to voice what he'd like to do.

### **c. Officer Appointments**

Mr. Wiggins recommended Mr. Don Patten as the new Chair for the Subcommittee. Mr. Patten left the room briefly for the group to discuss. After some discussion, a motion to recommend Mr. Patten as the new Subcommittee Chair was made, seconded, and unanimously approved.

## **9. Open PRD Items Related to Installation**

The only PRD Item that needed attention from the Subcommittee was **Item 21-52**. Notes on that Item are included below. The rest of the PRD Items are still being discussed in the task groups.

- NB15-0305 – Create Guidelines for Installation of Overpressure Protection by System Design – D. Marek (PM)
- NB15-0315 – Review isolation valve requirements in Part 1, 4.5.6 and 5.3.6 – D. DeMichael (PM)
- 17-119 – Part 4, 2.2.5 states that pressure setting may exceed 10% range. Clarify by how much – T. Patel (PM). This Item is on hold pending ASME action.
- 19-83 – Address Alternate Pressure Relief Valve Mounting Permitted by ASME CC2887-1 – D. Marek (PM).
- 21-52 – Incorrect paragraph reference at end of Part 4 2.5.3 a) and Part 1 4.5.3 a)

Ms. Wadkinson and Mr. Clark gave an overview of PRD's proposal. After some discussion, a motion to recommend to Main Committee accepting the proposal was made, seconded, and unanimously approved.

## **10. Interpretations**

There are no Part 1 interpretation requests to address.

## 11. Action Items

Item Number: NB11-1901	NBIC Location: Part 1	Attachment Pages 2-9
<b>General Description:</b> Add guidance for the safe installation of high-pressure composite pressure vessels operating in close proximity to the public		
<b>Subgroup:</b> FRP		
<b>Task Group:</b> R. Smith (PM), M. Richard, S. Konopacki, D. Patten, and E. Wiggins		
<b>Update Following July 2021 Meeting:</b> The proposal was balloted to both Subcommittee Installation and Subcommittee PRD. The Installation ballot passed with no comments, and the PRD ballot passed with three disapproval votes. In his response to those votes, the project manager R. Smith stated that he would review the comments to see if any adjustments needed to be made to the proposal.		
<b>January 2022 Meeting Action: Proposal</b> Ms. Kimberly Gates (alternate for Rex Smith) relayed that Mr. Smith would like to send the proposal as is to letter ballot to Main Committee. The Subcommittee unanimously agreed.		

Item Number: 20-27	NBIC Location: Part 1, 1.6.9 & S6.3	No Attachment
<b>General Description:</b> Carbon Monoxide Detector/Alarm NBIC 2019		
<b>Subgroup:</b> SG Installation		
<b>Task Group:</b> E. Wiggins (PM), G. Tompkins, R. Spiker, R. Smith, S. Konopacki, R. Austin, T. Creacy, and J. Kleiss		
<b>Explanation of Need:</b> These codes are being enforced by some jurisdictions on existing installations. Inspectors need to know what codes we need to enforce. Do the detectors have specific levels of CO when an alarm is to go off? Is there a requirement for an audible alarm or decibel level of the alarm? Where in the boiler room should the alarm/monitor be mounted?		
<b>January 2022 Meeting Action: Progress Report</b> Mr. Wiggins summarized the discussion the Subgroup had with National Board staff regarding this Item. It was unanimously agreed to send this Item to the Executive Committee to discuss.		

Item Number: 20-33	NBIC Location: Part 1	No Attachment
<b>General Description:</b> Flow or Temp Sensing Devices forced Circulation Boilers		
<b>Subgroup:</b> SG Installation		
<b>Task Group:</b> M. Downs (PM), D. Patten, M. Wadkinson		
<b>Explanation of Need:</b> Incorporation of applicable CSD-1 requirements.		
<b>January 2022 Meeting Action: Progress Report</b> There were no updates for this Item.		

<b>Item Number: 20-34</b>	<b>NBIC Location: Part 1</b>	<b>No Attachment</b>
<p><b>General Description:</b> Venting of gas train components</p> <p><b>Subgroup:</b> SG Installation</p> <p><b>Task Group:</b> P. Jennings (PM), M. Washington, R. Adams</p> <p><b>Explanation of Need:</b> Incorporation of applicable CSD-1 requirements.</p> <p><b>January 2022 Meeting Action: Progress Report</b>  Mr. Jennings summarized the Subgroup's discussion of this Item where he spoke about the letter ballot comments and his responses to those comments. A motion was made, seconded, and unanimously approved to send the proposal as a letter ballot to the Subcommittee.</p>		

<b>Item Number: 20-39</b>	<b>NBIC Location: Part 1</b>	<b>Attachment Pages 10-11</b>
<p><b>General Description:</b> Modular Boilers</p> <p><b>Subgroup:</b> SG Installation</p> <p><b>Task Group:</b> T. Clark (PM), M. Downs, M. Wadkinson, D. Patten, R. Austin</p> <p><b>Explanation of Need:</b> Incorporation of applicable CSD-1 requirements.</p> <p><b>January 2022 Meeting Action: Proposal</b>  Mr. Clark summarized the discussion from the Subgroup meeting, including the errata from ASME. After some discussion on the language of the proposal, Ms. Wadkinson recommended it be letter balloted to the Main Committee. A motion to letter ballot the proposal to the Main Committee was made, seconded, and unanimously approved.</p>		

<b>Item Number: 20-41</b>	<b>NBIC Location: Part 1</b>	<b>Attachment Page 12</b>
<p><b>General Description:</b> Safety and Safety Relief Valves for Steam and Hot Water Heating Boilers.</p> <p><b>Subgroup:</b> SG Installation</p> <p><b>Task Group:</b> E. Wiggins (PM), J. Brockman (remote), G. Tompkins</p> <p><b>Explanation of Need:</b> Incorporation of applicable CSD-1 requirements.</p> <p><b>January 2022 Meeting Action: Proposal</b>  This Item passed Subcommittee Installation and Subcommittee PRD letter ballot. The proposal will be up for a voice vote from Main Committee.</p>		

<b>Item Number: 20-43</b>	<b>NBIC Location: Part 1</b>	<b>Attachment Page 13</b>
<p><b>General Description:</b> Safety Relief valve for Hot Water Supply Boilers</p> <p><b>Subgroup:</b> SG Installation</p> <p><b>Task Group:</b> W. Anderson (PM), E. Wiggins, J. Brockman</p> <p><b>Explanation of Need:</b> Incorporation of applicable CSD-1 requirements.</p> <p><b>January 2022 Meeting Action: Proposal</b>  This Item passed Subcommittee Installation and Subcommittee PRD letter ballot. The proposal will be up for a voice vote from Main Committee.</p>		

<b>Item Number: 20-44</b>	<b>NBIC Location: Part 1</b>	<b>No Attachment</b>
<p><b>General Description:</b> CW Vacuum Boilers</p> <p><b>Subgroup:</b> SG Installation</p> <p><b>Task Group:</b> R. Spiker (PM), M. Washington, and M. Byrum</p> <p><b>Explanation of Need:</b> Incorporation of applicable CSD-1 requirements.</p> <p><b>January 2022 Meeting Action: Progress report</b>  Mr. Spiker stated that the task group will work on some new language for this proposal.</p>		

<b>Item Number: 20-62</b>	<b>NBIC Location: Part 1, 1.4.5.1</b>	<b>No Attachment</b>
<p><b>General Description:</b> Update the National Board Boiler Installation Report</p> <p><b>Subgroup:</b> SG Installation</p> <p><b>Task Group:</b> T. Clark (PM), E. Wiggins, R. Spiker, T. Creacy, P. Jennings, G. Tompkins, and D. Patten.</p> <p><b>Explanation of Need:</b> The form has not been updated in years. The form will be part of the National Boards Jurisdictional Reporting System which is currently under development.</p> <p><b>January 2022 Meeting Action: Progress Report</b>  Mr. Clark stated that the task group is working on a proposal to have ready for the July 2022 meeting.</p>		

<b>Item Number: 20-86</b>	<b>NBIC Location: Part 1, 2.10.1 a)</b>	<b>No Attachment</b>
<p><b>General Description:</b> Testing and Acceptance: Boiling-out Procedure</p> <p><b>Subgroup:</b> SG Installation</p> <p><b>Task Group:</b> E. Wiggins (PM), D. Patten, M. Washington, and S. Konopacki (remote).</p> <p><b>Explanation of Need:</b> This was brought to my (Mr. Eddie Wiggins) attention by Ernest Brantley. Mr. Brantley indicated during an acceptance inspection, he found boiler with excessive oil on the tubes and tube sheet after boiler was delivered and installed. He could not find any reference to boil- out to remove this extraneous material.</p> <p><b>January 2022 Meeting Action: Progress Report</b> Mr. Wiggins explained that Mr. Patten had submitted some new verbiage for this Item and that it will be out for letter ballot to the Subgroup.</p>		

## 12. New Items:

<b>Item Number: 21-55</b>	<b>NBIC Location: Part 1, 3.7.5.1 b)</b>	<b>Attachment Pages 14-16</b>
<p><b>General Description:</b> Isolation valves</p> <p><b>Subgroup:</b> SG Installation</p> <p><b>Task Group:</b> J. Kleiss (PM), T. Clark, R. Austin</p> <p><b>Explanation of Need:</b> The inquirer manufactures a packaged pool heating system that uses a water-to-water heat exchanger to isolate the water boiler from the pool heating system loop. They do not provide stop valves between the boiler and the heat exchanger. Even though the boiler can be drained and serviced without draining or disturbing the primary system, they are told that NBIC Part 1, 3.7.5.1 mandates that isolation valves be installed on the boiler. This is a non-value-added expense to change the package design and rework existing installations. This has no impact on safety and is also consistent with the conditions and exemptions currently in 3.7.5.1 b and provides a needed clarification to the existing language.</p> <p><b>January 2022 Meeting Action: Proposal</b> Mr. Kleiss updated the Subcommittee on his proposal. A motion to send the proposal to the Main Committee for a voice vote was made, seconded, and unanimously approved.</p>		

## 13. New Business:

Mr. Patten stated that there were six people who didn't vote in a recent letter ballot (Item 20-43). The lack of participation in online ballots needs to be addressed.

## 14. Future Meetings

- July 2022 – TBD: Mr. Ponce explained that the National Board is currently checking out a couple places for the July meeting.
- January 2023 – TBD

### 13. Adjournment

Mr. Wiggins made a motion to adjourn the meeting at 9:14 a.m. (PST). The motion to adjourn the meeting was seconded and unanimously approved.

Respectfully submitted,

A handwritten signature in black ink that reads "Michelle Vance". The signature is written in a cursive, flowing style.

Michelle Vance  
Subcommittee Installation Secretary



## Subcommittee Installation Attendance: January 19, 2022

<b>MEMBERS:</b>	<b>Interest Category</b>	<b>In Person</b>	<b>Remote</b>	<b>Not In Attendance</b>
Melissa Wadkinson	Manufacturers	X		
Edward Wiggins	Jurisdictional Authorities	X		
Randall Austin	Users	X		
Joe Brockman	Authorized Inspection Agencies		X	
Todd Creacy	Authorized Inspection Agencies		X	
J. Matt Downs	Manufacturers			X
Patrick Jennings	Authorized Inspection Agencies		X	
Stanley Konopacki	Users		X	
Don Patten	Manufacturers	X		
H. Michael Richards	General Interest		X	
Kimberly Gates (alternate for Rex Smith)	Authorized Inspection Agencies		X	
Ronald Spiker	Jurisdictional Authorities		X	
Milton Washington	Jurisdictional Authorities		X	
Jeanne Bock	Secretary		X	
Michelle Vance	Secretary	X		

<b>VISITORS:</b>	<b>Company/Title/Interest</b>	<b>In Person</b>	<b>Remote</b>
Jim Byrum	SG 1; Arise Boiler Inspection and Insurance Company, RRG		X
Bryan Ahee	Bradford White Corporation		X
Rodger Adams	Zurich Resilience Solutions		X
Tom Clark	SG 1; State of Oregon BCD	X	
Gene Tompkins	SG 1; ABMA	X	
Joseph Beauregard	Los Alamos National Laboratory	X	
Jeff Kleiss	Lochinvar, LLC.	X	
Sean Skiles	Fulton Equipment Pacific dba Fulton Pacific Boiler Solutions	X	
Robert Wielgoszinski	Hartford Steam Boiler	X	
Luis Ponce	NBBI Staff	X	

# NB11-1901

## SUPPLEMENT X

### INSTALLATION OF HIGH PRESSURE COMPOSITE PRESSURE VESSELS

#### **SX.1 SCOPE**

This supplement provides requirements for the installation of high-pressure composite pressure vessels. This supplement is applicable to pressure vessels with an MAWP not exceeding 15,000 psi, and is applicable to the following classes of vessels:

- a) Metallic vessel with a Fiber Reinforced Plastic (FRP) hoop wrap over the shell part of the vessel both load sharing)
- b) Metallic vessel with a full FRP wrap (both load sharing)
- c) FRP vessel with a non-load sharing metallic liner
- d) FRP vessel with a non-load sharing non-metallic liner

#### **SX.2 SUPPORTS**

Design of supports, foundations, and settings shall consider the dead loads, live loads, wind, and seismic loads. Vibration and thermal expansion shall also be considered. The design of supports, foundations, and settings shall be in accordance with ASCE/SEI 7, *Minimum Design Loads for Buildings and Other Structures*. The importance factors used in calculating the seismic and wind loads shall be the

highest value specified for any category in ASCE/SEI 7.

### **SX.3 CLEARANCES**

The pressure vessel installation shall allow sufficient clearance for normal operation, maintenance, and inspection. Stacking of pressure vessels is permitted. The minimum clear space between pressure vessels shall be 1 ft. vertical and 2 ft. horizontal. Vessel nameplates shall be visible after installation for inspection. The location of vessels containing flammable compressed natural gas fluids shall comply with NFPA 52. The location of vessels containing hydrogen or other flammable fluids shall comply with NFPA 2. The vessel owner shall document the vessel pressure and pipe diameters used as a basis for compliance with NFPA 2 location requirements.

### **SX.4 PIPING LOADS**

Piping loads on vessel nozzles shall be determined by a formal flexibility analysis per ASME B31.12: paragraph IP-6.1.5(b). The piping loads shall not exceed the maximum nozzle loads defined by the vessel manufacturer.

### **SX.5 MECHANICAL CONNECTIONS**

Mechanical connections shall comply with pressure vessel manufacturer's instructions, and with requirements of the Jurisdiction. Connections to threaded nozzles shall have primary and secondary seals. The seal design shall include a method for detecting a leak in the primary seal. Seal functionality shall be demonstrated at the initial pressurization of the vessel.

### **SX.6 PRESSURE INDICATING DEVICES**

Each pressure vessel shall be equipped with a pressure gage mounted on the vessel. The dial range shall be from 0 psi to not less than 1.25 times the vessel MAWP. The pressure gage shall have an opening not to exceed 0.0550in (1.4mm) (No. 54 drill size) at the inlet connection. In addition, vessel pressure shall be monitored by a suitable remote pressure indicating device with alarm having an indicating range of 0 psi to not less than 1.25 times the vessel MAWP.

### **SX.7 PRESSURE RELIEF DEVICES**

Each pressure vessel shall be protected by pressure relief devices per the following requirements:

- a) Pressure relief devices shall be suitable for the intended service.
- b) Pressure relief devices shall be manufactured in accordance with a national or international standard and certified for capacity (or resistance to flow for rupture disk devices) by the National Board.
- c) Dead weight or weighted lever pressure relief valves are prohibited.
- d) Pressure relief valves shall not be fitted with lifting devices.
- e) The pressure relief device shall be installed directly on the pressure vessel with no isolation valves between the vessel and the pressure relief device except:

1) When these isolation valves are so constructed or positively controlled below the minimum required capacity, that closing the maximum number of valves at one time will not reduce the pressure relieving capacity, or

2) Upon specific acceptance of the Jurisdiction, an isolation valve between vessel and its pressure relief device may be provided for vessel inspection and repair only. The isolation valve shall be arranged so it can be locked or sealed open.

f) The discharge from pressure relief device(s) shall be directed upward to prevent any impingement of escaping fluid upon the vessel, adjacent vessels, adjacent structures, or personnel. The discharge must be to outdoors, not under any structure or roof that might permit formation of a "cloud". The pressure relief device(s) discharge piping shall be designed so that it cannot become plugged by animals, insects, rainwater, or other materials.

g) When a single pressure relieving device is used, it shall be set to operate at a pressure not exceeding the MAWP of the vessel. When the required capacity is provided in more than one pressure relieving device, only one device need be set at or below the MAWP, and the additional device(s) may be set to open at higher pressures but in no case at a pressure higher than 105% of the MAWP. The requirements of RR-130 of ASME Section X shall also apply.

- h) The pressure relief device(s) shall have sufficient capacity to ensure the pressure vessel does not exceed the MAWP of that specified in the original code of construction.
- i) The owner shall document the basis for selection of the pressure relief device(s) used, including capacity.
- j) The owner shall have such analysis available for review by the Jurisdiction.
- k) Pressure relief devices and discharge piping shall be supported so that reaction forces are not transmitted to the vessel.
- l) Heat detection system: a heat activated system shall be provided so that vessel contents will be vented per f) (above), if any part of the vessel is exposed to a temperature greater than 220°F.
- m) Positive methods shall be incorporated to prevent overfilling of the vessel.

## **SX.8 ASSESSMENT OF INSTALLATION**

- a) Isolation valve(s) shall be installed directly on each vessel, but not between the vessel and the pressure relief device except as noted in 3.7, e), above.
- b) Vessels shall not be buried.

c) Vessels may be installed in a vault subject to a hazard analysis, verified by the manufacturer, owner, user, qualified engineer, or the Jurisdiction, to include as a minimum the following:

- 1) Ventilation
- 2) Inlet and outlet openings
- 3) Access to vessels
- 4) Clearances
- 5) Intrusion of ground water
- 6) Designed for cover loads
- 7) Explosion control
- 8) Ignition sources
- 9) Noncombustible construction
- 10) Remote monitoring for leaks, smoke, and fire
- 11) Remote controlled isolation valves

d) Fire and heat detection/suppression provisions shall comply with the requirements of the Jurisdiction and, as a minimum, include relief scenarios in the event of a fire or impending overpressure from heat sources.

e) Installation locations shall provide the following:

- 1) Guard posts shall be provided to protect the vessels from vehicular damage per NFPA 2 or NFPA 52, as appropriate.

Protection from wind, seismic events shall be provided.

- 2) Supports and barriers shall be constructed of non-combustible materials.

- 3) Vessels shall be protected from degradation due to direct sunlight.

- 4) Access to vessels shall be limited to authorized personnel.

- 5) Any fence surrounding the vessels shall be provided with a minimum of two gates. The gates shall open outward, and shall be capable of being opened from the inside without a key.

- 6) Access for initial and periodic visual inspection and NDE of vessels, supports, piping, pressure gages or devices, relief devices and related piping, and other associated equipment.

- 7) Completed installations shall be validated as required by the Jurisdiction as addressing all of the above, and any requirements of the Jurisdiction, prior to first use. This verification shall be posted in a conspicuous location near the vessel and, when required, on file with the



Jurisdiction. Certificates shall be  
updated as required by mandated subsequent  
inspections.

8) Piping installation shall comply with ASME  
B31.12, NFPA 52, or NFPA 2.

9) The vessels shall be electrically bonded and  
grounded per NFPA 55.

## **SX.9 LADDERS AND RUNWAYS**

See NBIC Part 1, Section 1.6.4 *Ladders and Runways*

**Item 20-39**

Context: ASME Section IV does not require secondary low-water cutoffs on modular steam boilers, or any low pressure steam boilers for that matter. CSD-1 requires secondary low-water cutoffs on all low pressure steam boilers, including assembled modular units. NBIC Part 1, 3.8.1.5 c) currently requires secondary low-water cutoffs on low pressure steam boilers.

Proposed text if we align with CSD-1 and require a secondary low-water cutoff:

**3.8.1.6 MODULAR STEAM HEATING BOILERS**

a) Each module of a modular steam boiler shall be equipped with:

- 1) Steam gage, see NBIC Part 1, 3.8.1.1;
- 2) Water-gage glass, see NBIC Part 1, 3.8.1.2;
- 3) Pressure control, see [NBIC Part 1](#), 3.8.1.4 a); and
- 4) Low-water fuel cutoff, see [NBIC Part 1](#), 3.8.1.5 a).

b) The assembled modular steam heating boiler shall also be equipped with: ~~a pressure control. See NBIC Part 1, 3.8.1.4 b).~~

1) Pressure control, see NBIC Part 1, 3.8.1.4 b); and

2) Low-water fuel cutoff, see NBIC Part 1, 3.8.1.5 c).

~~Proposed text if we align with Section IV and do not require a secondary low-water cutoff:~~

**~~3.8.1.6 MODULAR STEAM HEATING BOILERS~~**

~~a) Each module of a modular steam boiler shall be equipped with:~~

- ~~1) Steam gage, see NBIC Part 1, 3.8.1.1;~~
- ~~2) Water-gage glass, see NBIC Part 1, 3.8.1.2;~~
- ~~3) Pressure control, see [NBIC Part 1](#), 3.8.1.4 a); and~~
- ~~4) Low-water fuel cutoff, see [NBIC Part 1](#), 3.8.1.5 a).~~

~~b) The assembled modular steam heating boiler shall also be equipped with a pressure control. See NBIC Part 1, 3.8.1.4 b).~~

ASME Section IV and CSD-1 wording for reference:

<p><b>HG-607 Modular Steam Heating Boilers</b></p> <p>(a) Each module of a modular steam heating boiler shall be equipped with</p> <ol style="list-style-type: none"> <li>(1) steam gage, see HG-602</li> <li>(2) water gage glass, see HG-603</li> <li>(3) a pressure control that will cut off the fuel supply when the pressure reaches an operating limit, which shall be less than the maximum allowable pressure</li> <li>(4) low water cutoff, see HG-606</li> </ol> <p>(b) The assembled modular steam boiler shall also be equipped with a safety limit control that will cut off the fuel supply to prevent steam pressure from exceeding the 15 psi (100 kPa) maximum allowable working pressure of the boiler. The control shall be constructed to prevent a pressure setting above 15 psi (100 kPa).</p> <p>(c) When the assembled modular boiler is certified as a single boiler in accordance with HG-530.3(b), the steam gage required on each module by (a)(1) may be replaced by a single gage located on the supply header.</p>	<p><b>HG-606 Automatic Low-Water Fuel Cutoff and/or Water Feeding Device</b></p> <p>(a) Each automatically fired steam boiler shall have an automatic low-water fuel cutoff, conforming to UL 353, Standard for Limit Controls, and accepted by a nationally recognized testing agency. This device shall be so located as to automatically cut off the fuel supply before the surface of the water falls below the lowest visible part of the water gage glass. If a water feeding device is installed, it shall be so constructed that the water inlet valve cannot feed water into the boiler through the float chamber and so located as to supply requisite feedwater.</p> <p>(b) Such a fuel cutoff or water feeding device may be attached directly to a boiler. A fuel cutoff or water feeding device may also be installed in the tapped openings available for attaching a water glass directly to a boiler, provided the connections are made to the boiler with nonferrous tees or Y's not less than NPS ½ (DN 15) between the boiler and the water glass so that the water glass is attached directly and as close as possible to the boiler; the run of the tee or Y shall take the water glass fittings, and the side outlet or branch of the tee or Y shall take the fuel cutoff or water feeding device. The ends of all nipples shall be reamed to full-size diameter.</p> <p>(c) Fuel cutoffs and water feeding devices embodying a separate chamber shall have a vertical drain pipe and a blowoff valve not less than NPS ¾ (DN 20), located at the lowest point in the water equalizing pipe connections so that the chamber and the equalizing pipe can be flushed and the device tested.</p>
<p><b>CW-610 Water Level Controls for Modular Steam Heating Boilers</b></p> <p>Modular steam heating boilers shall comply with CW-120, with the following differences:</p> <p>(a) Each module shall be equipped with an automatic low-water fuel cutoff.</p> <p>(b) The assembled modular steam boiler shall have a second low-water fuel cutoff mounted on a water column attached to the manifolds, or may be mounted on one of the modules, where the return piping is below the lowest safe waterline and all modules will drain equally. Operation of this low-water fuel cutoff shall shut off the fuel or energy supply to all modules.</p>	

Item Number: 20-41

ASME CSD-1 2018 Edition

#### CW-510 Requirements for Steam and Hot-Water Heating Boilers

The safety and safety relief valves of all steam and hot-water heating boilers shall conform to the ASME Boiler and Pressure Vessel Code, Section I or Section IV, as applicable.

NBIC Part I 2019 Edition

2.9.1 (e**b**) Pressure relief valve shall be manufactured in accordance with a national or international standard and be certified for capacity or flow resistance by the National Board.

**Commented [TB1]:** Correct paragraph reference is b)

**Commented [TB2]:** Flow resistance only applies to Section VIII non-reclosing pressure relief devices. It would not be appropriate to reference flow resistance here.

3.9.2 (a**)** Pressure Relief Valve requirements for steam heating boilers

**Commented [TB3]:** Correct paragraph reference is 3.9.2

(a) Pressure relief valve shall be manufactured in accordance with a national or international standard and be certified for capacity or flow resistance by the National Board.

**Commented [TB4]:** Flow resistance only applies to Section VIII non-reclosing pressure relief devices. It would not be appropriate to reference flow resistance here.

NBIC Part 4 2019 Edition

2.2.1b) Pressure relief valves shall be manufactured in accordance with a national or international standard and be certified for capacity by the National Board.

2.4.2 a) Pressure relief valves shall be manufactured in accordance with a national or international standard and be certified for capacity by the National Board.

Item Number: 20-43

ASME CSD-1 2018 Edition

#### CW-510 Requirements for Hot-Water Supply Boilers

The safety and safety relief valves of all hot-water supply boilers shall conform to the ASME Boiler and Pressure Vessel Code, Section I or Section IV, as applicable.

Part 1, 2019 Ed.

3.9.3 (a) Pressure relief valve shall be manufactured in accordance with a national or international standard and be certified for capacity or flow resistance by the National Board.

**Commented [TB1]:** Flow resistance only applies to Section VIII non-reclosing pressure relief devices. It would not be appropriate to reference flow resistance here.

Part 4, 2019 Ed.

2.4.3 a) Pressure relief valves shall be manufactured in accordance with a national or international standard and be certified for capacity by the National Board.

**Item Number: 21-55**

**NBIC Location: Part 1, 3.7.5.1 b)**

**General Description: Isolation Valves**

**Explanation of Need:**

The inquirer manufactures a packaged pool heating system that uses a water to water heat exchanger to isolate the water boiler from the pool heating system loop. They do not provide stop valves between the boiler and the heat exchanger. Even though the boiler can be drained and serviced without draining or disturbing the primary system, they are told that NBIC Part 1, 3.7.5.1 mandates that isolation valves be installed on the boiler. This is a non-value-added expense to change the package design and rework existing installations. This has no impact on safety and is also consistent with the conditions and exemptions currently in 3.7.5.1 b and provides a needed clarification to the existing language.

**Existing Text:**

### **3.7.5.1 STEAM HEATING, HOT-WATER HEATING, AND HOT-WATER SUPPLY BOILERS**

#### **a) For Single Steam Heating Boilers**

When a stop valve is used in the supply pipe connection of a single steam boiler, there shall be one installed in the return pipe connection.

#### **b) For Single Hot-Water Heating & Hot-Water Supply Boilers**

- 1) Stop valves shall be located at an accessible point in the supply and return pipe connections as near the boiler as is convenient and practicable, of a single hot water boiler installation to permit draining the boiler without emptying the system.
- 2) When the boiler is located above the system and can be drained without draining the system stop valves required in NBIC Part 1, 3.7.5.1 b) 1) may be eliminated.

#### **c) For Multiple Boiler Installations**

A stop valve shall be used in each supply- and-return pipe connection of two or more boilers connected to a common system. See NBIC Part 1, Figures 3.7.5.1-a, 3.7.5.1-b, and 3.7.5.1-c.

**Proposed Text:****3.7.5.1 STEAM HEATING, HOT-WATER HEATING, AND HOT-WATER SUPPLY BOILERS****a) For Single Steam Heating Boilers**

When a stop valve is used in the supply pipe connection of a single steam boiler, there shall be one installed in the return pipe connection.

**b) For Single Hot-Water Heating & Hot-Water Supply Boilers**

1) Stop valves shall be located at an accessible point in the supply and return pipe connections as near the boiler as is convenient and practicable, of a single hot water boiler installation to permit draining the boiler without emptying the system.

2) ~~When the boiler is located above the system and can be drained without draining the system stop valves required in NBIC Part 1, 3.7.5.1 b) 1) may be eliminated. The stop valves required in NBIC Part 1, 3.7.5.1 b) 1) may be eliminated when the boiler can be drained without draining the system. Means to allow draining the boiler without emptying the system may include installation of the boiler above the system or isolation of the boiler from the system by equipment.~~

**c) For Multiple Boiler Installations**

A stop valve shall be used in each supply- and-return pipe connection of two or more boilers connected to a common system. See NBIC Part 1, Figures 3.7.5.1-a, 3.7.5.1-b, and 3.7.5.1-c.

**Background Information:**

The proposed revisions are similar to a proposal in the balloting process at ASME BPVC IV (C&S Connect Record 21-1905). The initial ASME proposal included specific examples of equipment that would serve to isolate the boiler from the system. The only vote opposing the proposal advised that they would approve the proposal if the specific examples were removed from the proposal. The ASME proposal was revised accordingly and is expected to be approved in the next voting cycle.

The proposed revisions are identical to the updated ASME proposal with the exception to the numbering for the referenced clause.

The proposal was reviewed and approved by SG Installation and SC Installation at the January 2022 meeting.

If approved, this will maintain consistency between ASME BPVC IV and NBIC Part 1.