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THE NATIONAL BOARD
OF BOILER AND PRESSURE VESSEL INSPECTORS

NATIONAL BOARD INSPECTION CODE SUBGROUP INSTALLATION

MINUTES

Meeting of January 18, 2022
San Diego, CA

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The National Board of Boiler & Pressure Vessel Inspectors
1055 Crupper Avenue
Columbus, Ohio 43229-1183
Phone: (614)888-8320
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1. **Call to Order**
   Chairman Mr. Don Patten called the meeting to order at 8:02 a.m. (PST)

2. **Introduction of Members and Visitors**
   Mr. Patten gave an introduction of members and visitors. Everyone stated their name and company/interest category. Members on Zoom each introduced themselves with their name and company/interest category. 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 15 out of 17 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**
   Mr. Patten 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.

   - 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. Please register if you haven't already.

   - A coffee station will be provided outside of the meeting rooms on each floor.

   - Mr. Luis Ponce made an announcement stating that he will be giving a brief presentation on ASME Section VIII, for Part 3 Repairs and Alterations Subgroup (almost all Installation Subgroup members attended the meeting).

   - Ms. Vance added an announcement: The password for the Cloud has been updated. See the email from the NBIC Secretary.

6. **Adoption of the Agenda**
   No revisions to the agenda were suggested. A motion to adopt the agenda as presented was made, seconded, and unanimously approved.

7. **Approval of the Minutes of July 13, 2021 Meeting**
   A motion to approve the Minutes from the July 13, 2021 Subgroup meeting was made, seconded, and unanimously approved.

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

   a. **Membership Nominations**
      There were no new membership nominations.

b. Membership Reappointments

The following Subgroup members are up for reappointment: **Mr. William Anderson** and **Mr. Ron Spiker.** Their memberships are set to expire before the July 2022 NBIC meetings.

Mr. Spiker stated that he would like to renew his membership.
Mr. Anderson was not in attendance to voice what he'd like to do.

c. Officer Appointments

There were no new officer appointments.

9. Open PRD Items Related to Installation

The only PRD Item that needed attention from the Subgroup 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)-

The Subgroup viewed PRD's proposal briefly. A motion was made to recommend acceptance of the proposal to Subcommittee Installation and Subcommittee PRD. The motion was seconded and unanimously approved.

10. Interpretations

There are no Part 1 interpretation requests to address.

11. Action Items

Item Number: 20-27	NBIC Location: Part 1, 1.6.9 & S6.3	No Attachment

General Description: Carbon Monoxide Detector/Alarm NBIC 2019

Subgroup: SG Installation

Task Group: E. Wiggins (PM), G. Tompkins R. Spiker, R. Smith, S. Konopacki, and R. Austin, T. Creacy, J. Kleiss

Explanation of Need: 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?

Update: The proposal was balloted to the Subgroup and received several disapproval votes.

January 2022 Meeting Action: **Progress Report**
The Subgroup reviewed the letter ballot comments from this Item. Mr. Clark updated the Subgroup on his concerns and recommendations regarding this Item. Mr. Jennings presented his objections to the proposal and his suggestions for improvement. Mr. Troutt presented his viewpoint to the Subgroup. After a break, the Subgroup discussed the Item further with Mr. Gary Scribner and Mr. Luis Ponce. The Subgroup unanimously agreed to move this Item to the Executive Committee to discuss whether to incorporate this topic into a standalone document or to revise the NBIC Introduction to include terms other than pressure-retaining devices (e.g., CO alarms and controlled equipment).

Item Number: 20-33	NBIC Location: Part 1	No Attachment

General Description: Flow or Temp Sensing Devices forced Circulation Boilers

Subgroup: SG Installation

Task Group: M. Downs (PM), D. Patten, M. Wadkinson

Explanation of Need: Incorporation of applicable CSD-1 requirements.

January 2022 Meeting Action: **Progress Report**
Mr. Downs was not present at this meeting. Ms. Wadkinson stated that she will email Mr. Downs for an update on this Item.

Item Number: 20-34	NBIC Location: Part 1	Attachment Pages 2-19

General Description: Venting of gas train components

Subgroup: SG Installation

Task Group: P. Jennings (PM), M. Washington, R. Adams

Explanation of Need: Incorporation of applicable CSD-1 requirements.

January 2022 Meeting Action: **Proposal**
Mr. Jennings gave a brief overview of the letter ballot comments and his responses to those comments. After some discussion among the Subgroup, Mr. Jennings suggested this Item be letter balloted to the Subcommittee. His suggestion was seconded and unanimously approved.

Item Number: 20-39	NBIC Location: Part 1	Attachment Pages 20-21
General Description: Modular Boilers		

Subgroup: SG Installation

Task Group: T. Clark (PM), M. Downs, M. Wadkinson, D. Patten, R. Austin

Explanation of Need: Incorporation of applicable CSD-1 requirements.

January 2022 Meeting Action: **Proposal**
Mr. Clark updated the Subgroup on his proposal for this Item. After reviewing ASME IV Errata, Ms. Wadkinson stated that a letter will be sent to the Jurisdictions regarding the Errata. The Subgroup unanimously agreed to recommend acceptance of the proposal to the Subcommittee.

Item Number: 20-41	NBIC Location: Part 1	Attachment Page 22
General Description: Safety and Safety Relief Valves for Steam and Hot Water Heating Boilers.		

Subgroup: SG Installation

Task Group: E. Wiggins (PM), J. Brockman (remote), R. Spiker

Explanation of Need: Incorporation of applicable CSD-1 requirements.

January 2022 Meeting Action: Proposal
This Item passed Subcommittee Installation and Subcommittee PRD letter ballot. It will be forwarded on to the Main Committee for a voice vote.

Item Number: 20-43	NBIC Location: Part 1	Attachment Page 23
General Description: Safety Relief valve for Hot Water Supply Boilers		

Subgroup: SG Installation

Task Group: W. Anderson (PM), E. Wiggins, J. Brockman

Explanation of Need: Incorporation of applicable CSD-1 requirements.

January 2022 Meeting Action: **Proposal**
This Item passed Subcommittee Installation and Subcommittee PRD letter ballot. This will be forwarded on to the Main Committee for a voice vote.

Item Number: 20-44	NBIC Location: Part 1	No Attachment

General Description: CW Vacuum Boilers

Subgroup: SG Installation

Task Group: R. Spiker (PM), M. Washington, and J. Byrum

Explanation of Need: Incorporation of applicable CSD-1 requirements.

January 2022 Meeting Action: **Progress Report**
Mr. Byrum summarized his updated proposal. After some discussion, it was decided that he will go back to the Manufacturer for more information.

Item Number: 20-62	NBIC Location: Part 1, 1.4.5.1	No Attachment

General Description: Update the National Board Boiler Installation Report

Subgroup: SG Installation

Task Group: T. Clark (PM), E. Wiggins, R. Spiker, T. Creacy, P. Jennings, G. Tompkins, and D. Patten.

Explanation of Need: 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.

January 2022 Meeting Action: **Progress Report**
Mr. Clark presented a rough draft of the new Installation Report I-1 form, as well as some of his additional suggested revisions to incorporate. The task group will continue to work on the form this week and are hoping to have a proposal by the July 2022 meeting.

Item Number: 20-86	NBIC Location: Part 1, 2.10.1 a)	Attachment Page 24

General Description: Testing and Acceptance: Boiling-out Procedure

Subgroup: SG Installation

Task Group: E. Wiggins (PM), D. Patten, M. Washington, and S. Konopacki

Explanation of Need: 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.

January 2022 Meeting Action: **Proposal to Letter Ballot to Subgroup**
Mr. Patten presented his proposal. Ms. Wadkinson suggested sending this as a letter ballot to the Subgroup, then once approved, sending it as a letter ballot to Subgroup Inspection and Subgroup Repairs and Alterations. This suggestion was seconded and unanimously approved.

12. New Items:

Item Number: 21-55	NBIC Location: Part 1, 3.7.5.1 b)	Attachment Pages 25-26

General Description: Isolation Valves

Subgroup: SG Installation

Task Group: J. Kleiss (PM), T. Clark, R. Austin

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.

January 2022 Meeting Action: **Proposal**
Mr. Kleiss presented his proposal to the Subgroup. After was some discussion, a motion was made, seconded, and unanimously approved to pass this proposal to the Subcommittee.

13. Future Meetings

- July 2022 – TBD
- January 2023 – TBD

14. Adjournment

Mr. Patten adjourned the meeting at 2:02pm (PST).

Respectfully submitted,

Michelle Vance
Subgroup Installation Secretary

Subgroup Installation Attendance: January 18, 2022

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

VISITORS:	Company/Title/Interest	In Person	Remote
Rodger Adams	Zurich Resilience Solutions		x
Bryan Ahee	Bradford White Corporation		x
Joseph Beauregard	Los Alamos National Laboratory	x	
Rob Troutt	BOT Chairman	x	
Jeff Kleiss	Lochinvar, LLC.	x	
Tim Simmons	NBBI Liasion for Boiler Makers Union	x	
Sean Skiles	Fulton Equipment Pacific dba Fulton Pacific Boiler Solutions	x	
Luis Ponce	NBBI staff	x	

ITEM 20-34, 20-35 (and 20-40) COMBINED

Jan 2022 Proposal with Comments.

All fuel systems shall be installed in accordance with jurisdictional and environmental requirements, manufacturer's recommendations, and/or industry standards, such as ASME CSD-1, ANSI Z/CSA, NFPA 85 or others, as applicable. The following are requirements for Natural Gas, Propane and #2 fuel oil.

a) Natural Gas and Propane

1) Cleaning

a. It is recommended that strainers be installed in the main gas line leading to the boiler control equipment.

b. A sediment trap is required prior to the gas controls. This trap shall be located in a vertical section of pipe as close as practical upstream of the gas controls.

2) Manual Valves

a. A manual valve is required upstream of all controls and as close as practical to the boiler to isolate the fuel train when required. If a pilot line is upstream of the manual valve on the main fuel train, it shall also have a manual valve.

b. These manual valves shall be accessible from the a floor, platform, walkway or runway. Accessibility shall mean within a 6 ft (1.8m) elevation of the standing space and not more than 12 in. (305 mm) horizontally from the standing space edge. The manual valves shall be designed to be opened/closed without additional tools. They shall be ball or a lubricated plug type with a non-removable handle that is perpendicular to the gas flow when closed and parallel when open and the valves shall have stops.

c. If the non-removable handle creates a hazard, the handle can be designed to be temporarily removed provided all of the following are incorporated:

i. the valve handle is always on while the valve is in the open position.

ii. At all times, the position of the valve shall be indicated.

iii. When the valve is in the closed position and the handle is not attached, the valve shall be tagged/locked out and the handle shall be tethered and accessible.

d. If the valve is not part of a listed and labeled assembly, the valve shall comply with a nationally recognized standard.

3) Vents

For gas components that are vented or bled, the following requirements apply:

a. All vent or bleed lines from natural gas equipment such as regulators, controls, switches, relief, vent valves, etc. shall be vented outside to a safe point of discharge per the manufacturer's requirements or the authority having jurisdiction.

b. Vent and bleed line shall be sized in accordance with a nationally recognized standard.

c. Manifold of vent lines or of bleed lines shall be in accordance with a nationally recognized standard. Vent lines shall not be manifolded with bleed lines.

Commented [JPHH1]: This is to address the comments on other fuels.

Commented [JPHH2]: Added And Propane

Commented [JPHH3]: Q Tom Clark – Do these constitute emergency shutoff valves.
A – No – These are isolation.

But the text of 2.56 and 3.56 regarding accessibility are relevant.

Commented [JPHH4]: Added these words to incorporate "accessible" language from 2.56 and 3.56 per T Clark Suggestion

Commented [JPHH5]: Changed this for clarity per the suggestion of T. Clark.

d. No vent or bleed line shall discharge into a flue.

e. Vent materials shall be selected such that they shall have suitable strength and durability for their intended purpose and shall be listed for the intended purpose by the jurisdiction having authority or a nationally recognized standard.

b) Fuel Oil -

A properly sized and rated oil strainer or filter shall be installed upstream of the safety shutoff valves.

Commented [JPHH6]: Added "properly sized and rated"

MAJOR COMMENTS

nber: Randall Austin **Vote Date:** 2021-09-09 **Vote:** Disapproved **Uploads:**

ent: I feel the proposal falls short of CSD-1 Part CF and NFPA 85, 86, 54. Things like leak test valves installed on SSOV's, and the need for performing leak test per manufacturers instructions, use of approved vent limiting devices for gas pressure regulators, proper installation of the end of piping of vents outside of building.

Thanks for the feedback. This will all be considered in the next version for discussion. Note that NFPA 85,86 54 are not in the body of knowledge for inservice inspectors and are outside the scope. Please see comment to Mr. Clark also.

Tom Clark **Vote Date:** 2021-09-09 **Vote:** Disapproved **Uploads:** 6248.BALREPLY.6700.docx

See the attached document for my thoughts. My main concern is the potential scope creep of addressing fuel sources.

Thanks for the thoughtful feedback. Currently CSD-1 is in the body of knowledge document (NB-331). CSD-1 is only for oil and gas, but it doesn't clarify Natural Gas.

The intent as I understood the CSD-1 task groups (including this one) was to incorporate what the inspector could reasonably verify.

Don Patten **Vote Date:** 2021-09-02 **Vote:** Disapproved **Uploads:**

In looking at this the verbiage is only related to Natural Gas. I sell equipment that can fire on LPG, Bio-Gas, Landfill Gas, Digester Gas, Methane & other non-standard gaseous fuels. I think we should try to address this! The Fuel Oil section I recommend what is in NFPA 31. "A properly sized and rated oil filter or strainer shall be installed in the oil supply line to the burner." This covers a pump that may be install on the burner upstream of the safety shutoff valve(s).

Thank you for your comment. This is a good concern. While NG is the most common fuel, it is not exclusive. We will look at this and come back with proposed wording.

Melissa Wadkinson **Vote Date:** 2021-09-27 **Vote:** Disapproved **Uploads:**

Based on the comments, this needs to be taken back for more work. Regarding the fuels, I recommend that we have a statement that this is for natural gas, propane gas and #2 fuel oil. I believe that is the intent. For the other fuels, we may consider wording along the lines of "For fuels other than natural gas, propane gas or #2 fuel oil, follow the vessel and burner manufacturers' recommendations."

Thank you Ms. Wadkinson for the comments. After consideration, I do believe this is the best track. Due to the wide variety of fuel characteristics, it would be difficult to address other fuels than "standard" fuels.

Tom Clark

9/7/2021

Potential Scope Creep?

This item has me a little concerned with scope creep. I think it's a good thing to ensure our code is aligned with (or at least doesn't directly contradict) CSD-1, but I'm not sure parroting CSD-1 and other fuel codes is really adding value to Part 1. If we do pursue this, where do we draw the line? If we address natural gas, do we need to address other gaseous fuels? What about solid fuels? Do we also need to talk about other energy sources such as electrical and nuclear? This may be a rabbit hole we don't want to go down. I would be interested in having a conversation about the overall goal and expectations for revising 1.6.5 and what limitations we would like to set for ourselves.

BACKGROUND

JULY 2021

PROPOSED CHANGES – The following proposal is based on the comments recorded during the R&C ballot. Comments show where the changes were incorporated or felt they were already addressed. All comments are presented in the background information.

1.6.5 FUEL

All fuel systems shall be installed in accordance with jurisdictional and environmental requirements, manufacturer's recommendations, and/or industry standards, such as ASME CSD-1, ANSI Z/CSA, NFPA 85 or others, as applicable

Commented [JP-H7]: Ms. Wadkinson asked if we should include " or in accordance with the manufacturer's instructions?. This language was existing. Do we feel this is sufficient?

Commented [JP-H8]: Deleted a repetitively redundant "applicable" per Mr. Wiggins comment.

c) Natural Gas

4) Cleaning

a. It is recommended that strainers be installed in the main gas line leading to the boiler control equipment.

b. A sediment trap is required prior to the gas controls. This trap shall be located in a vertical section of pipe as close as practical upstream of the gas controls.

5) Manual Valves

a. A manual valve is required upstream of all controls and as close as practical to the boiler to isolate the fuel train when required. If a pilot line is upstream of the manual valve on the main fuel train, it shall also have a manual valve.

b. These manual valves shall be accessible from the floor and designed to be opened/closed without additional tools. They shall be ball or a lubricated plug type with a non-removable handle that is perpendicular to the gas flow when closed and parallel when open and the valves shall have stops.

c. If the non-removable handle creates a hazard, the handle can be temporarily removed provided the valve handle is always on while the valve is in the open position. At all times, the position of the valve shall be indicated. When the valve is in the closed position and the handle is not attached, the valve shall be tagged/locked out and the handle shall be tethered and accessible.

d. If the valve is not part of a listed and labeled assembly, the valve shall comply with a nationally recognized standard.

6) Vents

For gas components that are vented or bled, the following requirements apply:

a. All vent or bleed lines from natural gas equipment such as regulators, controls, switches, relief, vent valves, etc. shall be vented outside to a safe point of discharge per the manufacturer's requirements or the authority having jurisdiction.

b. Vent and bleed line shall be sized in accordance with a nationally recognized standard.

c. Manifold of vent lines or of bleed lines shall be in accordance with a nationally recognized standard. Vent lines shall not be manifolded with bleed lines.

d. No vent or bleed line shall discharge into a flue.

e. Vent materials shall be selected such that they shall have suitable strength and durability for their intended purpose and shall be listed for the intended purpose by the jurisdiction having authority or a nationally recognized standard.

d) Fuel Oil -

A strainer or filter shall be installed upstream of the safetyshutoff valves.

Commented [JP-H9]: This was added to address Mr. Pattens comment.

He noted that not some regulators, gas valves and switches are certified as ventless.

Commented [JP-H10]: Related to Ms. Wadkinson's comment. This could be considered redundant to the introductory "manufacturer's recommendation, but

I recommend keeping it, because this is the type of place where a MFR recommendation would be useful.

I did change "per the requirements of the manufacturer" to "per the manufacturer's requirements".

Commented [JP-H11]: For clarity, Item 20-35 was closed and the actions incorporated into item 20-34.

BACKGROUND INFORMATION

Comments to R&C ballot 4-22 to 05/21 2021

1) Don Patten

Committee Member:	Don Patten	**Vote Date:**	2021-04-29	**Vote:**	Approved	**Uploads:**	
Member Comment:	See below information. Something needs to be inserted in 3) Vents allowing for ventless gas components & trains. Exception: A regulator and vent limiting means combination listed as complying with ANSI Z21.80/CSA 6.22, Line Pressure Regulators, shall be permitted to be used without a vent to the outdoors. Also some gas valves and switches are certified as ventless (Siemens, Dungs, etc.).						
PM Reply:	Thank you for the comment. You are correct, there are many components that don't require vents. We already reference national standards in the opening, so perhaps an introductory statement such as the following would suffice: For gas components that are vented, the following requirements apply:						

2) Melissa Wadkinson

Committee Member:	Melissa Wadkinson	**Vote Date:**	2021-05-19	**Vote:**	Approved	**Uploads:**	
Member Comment:	I'll approve this but upon reading do we want to add some language "or in accordance with the manufacturer's instructions"?						
PM Reply:	Thank you for the comment and support. In the lead paragraph of 1.6.5, the existing words include manufacturer's recommendations. "All fuel systems shall be installed in accordance with jurisdictional and environmental requirements, manufacturer's recommendations, and/or industry standards, such as....." Everything added regarding Natural Gas is a subset to the lead in, so I believe that it is already covered. This raises a good question however. There is no guidance on how to resolve a conflict between the NBIC and the manufacturer's recommendation however.						

3) Eddie Wiggins

1.6.5 FUEL

All fuel systems shall be installed in accordance with jurisdictional and environmental requirements, manufacturer's recommendations, and/or industry standards, such as ASME CSD-1, applicable ANSI Z/CSA, NFPA 85 or others as applicable.

WE **Wiggins, Edward F 'Eddie'**
Pat, should this be removed due to it being the last word of the sentence?

4) H. Michael Richards

Committee Member:	H. Michael Richards	**Vote Date:**	2021-05-12	**Vote:**	Approved	**Uploads:**	
Member Comment:	As edited 5/12/2021						
PM Reply:	Mr. Richards. I am sorry, but I don't understand your comment.						

REVIEW – The following is the original review that led to the above.

NBIC part 1 addresses fuel for all boilers in 1.6.5. Controls are part of 2.5.3.3 and 3.5.3.3. The intent here is to address fuel train related items. It does not make sense to break up the equipment between fuel supply equipment (sediment trap, shutoff valves) and the controls equipment (vents). They are fuel related equipment, so the new requirements should be located in 1.6.5.

FOLLOWING is the Review of CSD-1 and what was suggested in the January 20 meeting.

CF - 120

CSD – 1 Summary	NBIC – Yes/No and words.	Should it cover
CF-120 – Fuel Train		
a) Non-mandatory appendix provides typical fuel train examples. Fuel trains other than those pictured, but meeting the standard shall be permitted.	Following are the current wording in NBIC. 1.4.5.1.1 Guide for Completing National Board Boiler Installation Report 40) External Piping ASME CODE AND FUEL TRAIN: Indicate if external piping is ASME Code, if not, indicate what code or standard external piping is manufactured to. Indicate if the fuel train meets the requirements of CSD-1 or… 1.6.5 Fuel – All fuel systems shall be installed in accordance with jurisdictional and environmental requirements, manufacturer's recommendations, and/or industry standards, such as ASME CSD-1, applicable ANSI Z/CSA, NFPA 85 or others as applicable. Fuel train component requirements will be based on the standard, fuel fired and the heat input. 2.5.2 Fuel See NBIC Part 1, Section 1.6.5, *Fuel*. 2.5.3.3 and 3.5.3.3 – Controls and Heat-Generating Apparatus a) Oil and gas-fired and electrically heated boilers shall be equipped with suitable primary (flame safeguard) safety controls, safety limit switches and controls, and burners or electric elements as required	YES

	by a nationally or internationally recognized standard. b) The symbol of the certifying organization that has investigated such equipment as having complied with a nationally recognized standard shall be affixed to the equipment and shall be considered as evidence that the unit was manufactured in accordance with that standard. c) These devices shall be installed in accordance with jurisdictional and environmental requirements, manufacturer's recommendations, and/or industry standards, as applicable. 3.5.2 Fuel See NBIC Part 1, Section 1.6.5, *Fuel*.	
c) Thread sealing compound resistant to LPG	No mention of thread sealing compound, etc. in NBIC Part 1, Installation.	No.

CF-130 – Filters or Strainers

CSD – 1 Summary	NBIC – Yes/No and words.	Should it cover
CF-130 – Filters or Strainers		
Filters or strainers are recommended in the main gas supply line.	Not mentioned.	Yes.

CF-140 – Sediment Traps and Drips

CSD – 1 Summary	NBIC – Yes/No and words.	Should it cover
CF-140 – Sediment Traps and Drips		
a) A sediment trap shall be installed before the controls. On a vertical. Manufacture supplies or specifies that the sediment trap is installed as close as practicable to the controls.	Also covered in NFGC NFPA 54 No mention of sediment traps and drips in NBIC Part 1, Installation.	Yes
b) If the gas is not dry, a drip shall be provided at any point where condensate could collect.	No – How do we know if its wet or dry	No

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CF-150 Manually Operated Gas shutoff valves

CF-150 Manually operated gas shutoff valves a) Unless provided as part of an assembly, each valve shall comply with ANSI, CSA, UL or a nationally recognized standard and be suitable	Not currently – Manually operated gas shutoff valves shall be provided and comply with a national standard and a symbol……	Yes
b) Manual shutoff valves shall be ball or lubricated plug type with stops.	Gas shut off valves shall be ball or lubricated plug type	Yes
c) Manually operated valves shall be T-handle or lever-handled with handle parallel to the gas flow when open and perpendicular when closed. Valve shall be accessible and indicate open/closed. Adequate size to be operated without using tools. Maintained and exercised in accordance with manufacturer's instructions.	Handles attached so the handle is parallel when open and perpendicular when closed. Valve shall be accessible and indicate open/closed. Adequate size.	Yes
d) Except as allowed in e) below the handle shall be permanently attached.	Similar to CF-150 d) and e) Handle permanently attached unless it creates a hazard. Handle can be **temporarily** (must be reattached before operator leaves) removed and reattached, must be attached when open.	Yes Do we want to define temporarily.
e) A removable handle is permitted in certain conditions (creates a personnel hazard or obstruction). In these cases, the handle must meet all of the following: 1) Handle remains installed when valve is open 2) Handle can only be reattached so the handle is perpendicular to the flow in a closed position 3) Valve position is indicated, with or without handle 4) Upon removal, the handle must be turned and reattached180 deg to remove hazard or tethered no more than 3 ft away and usable trouble free without untethering 5) A handle tethered in 4) above shall only be permitted when the line is	Do we want to go into this level of detail?	MAYBE

Commented [RA12]: I think "temporarily" is defined by stating, "must be reattached before operator leaves".

Commented [RA13]: Yes…I think we should discuss the instances of when a removable handle is permitted if it we are going to allow it in the NBIC.

tagged/locked out to prevent operation		
f) A manually operated valve shall be provided upstream from all other main gas controls to isolate the fuel train 1) Valve shall be within 6 ft of the boiler and accessible from the floor 2) When a valve is not required per h), then the valve require by f) shall be located immediately external to the boiler/burner unit		Yes
g) When the pilot gas is obtained independently or upstream of the manual shutoff valve, a separate manual valve (per a-e) shall be located in the gas supply line to the pilot. When the pilot is downstream of f) one or more manual valves or other means to permit turndown tests and/or pressurization of the pilot without pressurizing the main fuel train.	But only on the pilot being independent or upstream of the manual shut off valve.	Yes
h) A manually operated shutoff valve in 1-e shall be provided after the downstream SSV to the main burner or group of burners if required by the boiler/burner mfgr for testing or maintenance.	How does the inspector know what the Mfgr requirements are.	No

I would suggest a paragraph in the following manner.

A manual valve is required upstream of all controls and within 6 ft of the boiler to isolate the fuel train. If a pilot line is independent from the main gas train, it shall also have a manual valve. These manual valves shall be accessible from the floor and designed to be opened/closed without additional tools. They shall be valve ball or plug type with a non-removable handle that is perpendicular to the gas flow when closed and parallel when open. The handle can be temporarily removed if…. At all times, the position of the valve shall be indicated.

Commented [RA14]: I understand what the intent is by saying "within 6 ft. of the boiler"; however, is this ambiguous in that someone could think it has to be within 6 ft. of the boiler in the gas train?

CF-160 – Gas pressure Regulators

Commented [RA15]: Just as you specified with CF-160 – CF-180, I think gas pressure regulators, control valves, and SSV's are specific to fuel train systems and should NOT be part of the NBIC.

We don't get into specific's about burners; therefore, why would we get into specifics about fuel train components?

I think we stop after the manually operated gas shutoff valve. If we include gas pressure regulators, etc. then we have to include all gas train components, in my opinion and I don't believe that's within the scope of the NBIC.

CF-160 Gas Pressure Regulators		
a) Individual Gas pressure regulators or regulators that are part of a combination valve shall be used for both the pilot and main gas per ANSI Z21.78/CSA 6.2. Regulated pressure shall be within +/- 10% set pressure at all firing rates. Pressure test port required	Do we need to specify equipment downstream of the gas shutoff valve or rely on the 1.6.5 and the reliance on an industry standard?	Committee Question

b) Regulators with integral vent limiters – meet ANSI Z21.18/CSA 6.3.		No
c) Second stage regulators for LPG gas (alone or in combo) must comply with UL 144 and installed per NFPA 58		No

CF-161 – Overpressure Protection		
a) If the MAWP of any component is less than the entering gas pressure so a regulator failure would produce pressure above the MAWP, the downstream piping system shall have overpressure protection.	See CF 160	
b) If OP protection is require, it shall be located upstream of all controls for both the burner and the Pilot. OP devices shall be vented to safe point of discharge, if required.		
c) CG-210 is referenced. (NFPA 54 gas, NFPA 31 oil and NFPA 58 LP gas)		
d) OP, if required, may be provided by any device listed in the latest NFPA 54/ANSI Z223.1		

CF-162 – Gas Pressure Supervision		
a) Gas pressure supervision shall be provided based on heat input and firing system type (power, mech draft, pulse – or – natural draft.) to accomplish a safety shutdown and lockout in the event of either high or low gas pressure.	See CF 160	
b) Location 1) High pressure downstream of main regulator – Switch locks		

out before the manifold gas pressure exceeds a) The boiler/burner manufacturer's specified setting b) 150% of the boiler/burner main manifold gas pressure if not specified by manufacturer		
2) High pressure upstream of main regulator – the regulator must be a zero governor pressure regulator. The high pressure switch locks out when the supply pressure exceeds a) The setting of the OP protection device in CF 161 if equipped. b) The boiler/burner manufacturers specified setting c) 150% of the boiler/burner main manifold gas pressure if not specified by manufacturer A high gas pressure switch is not required when a boiler unit incorporates a listed shutoff valve with a zero governor pressure regulator that causes a safety shutdown if the zero governor pressure regulator fails due to a ruptured diaphragm		
c) Low gas pressure shall function to accomplish a safety shutdown before the main manifold gas pressure is less than 1 The boiler/burner manufacturer's specified setting 2 50% of the boiler/burner's main manifold gas	See CF-160 No – Even if we do agree that switches should be included.	

pressure if the setting is not specified. The low gas pressure switch shall be located upstream of the SSVs. When the low gas-pressure switch is located upstream of the main gas-pressure regulator, the burner or boiler unit shall be labeled and listed by a nationally recognized testing agency for this arrangement.		
d) Pressure test port(s) are required		
e) Gas-pressure switches shall be labeled and listed	As part of 1.6.5?	
f) Switches shall be capable of withstanding a pressure not less than 10% above the relieving pressure of the nearest upstream OP device. When no relief is provided, the switches shall be capable a pressure not less than the maximum inlet pressure of the nearest gas-pressure regulator. When the high gas-pressure switch is located downstream of the SSV, the switch shall be capable of withstanding a pressure no less than 50% above it's upper set point limit.	No. Even in we do agree that switches should be included.	
g) Gas-pressure switches of the automatic or manual reset type shall be electrically connected in accordance with CE-110(j)	No	

Part 1

CF-170 – Control Valves

CF – 170 – Control Valves		

a) An automatic input, complete closure, control valve may be combined with a SSV.	See CF 160	
b) A bypass valve may be installed only around a control valve, not any valve that is a shutoff		

CF-180 Safety Shutoff Valves (SSV)

CF-180 Safety Shutoff Valves (SSV)		
a) Each main and pilot shall have a SSV that is compliant with one of the ANSI/CSA or UL 429	See CF 160	
b) Single burners main burner supply line shall be equipped as follows 1) <= 500K, Two safety shutoff in series (can be single body) or one safety shutoff with a proof of closer interlock. If the two shutoff valves are in on body, they shall be in series with independently operated shafts 2) >= 500 K up to 12.5 million, Two SSVs in series that may be in a single valve body. At least one shall incorporate a proof of closure interlock. If the two shutoff valves are in on boy, they shall be in series with independently operated shafts 3) If there is a branch line to a second burner, either a or b following apply a. <500K b) 1) applies b. >500K up to 12.5 million – 1) Safety shutoff in b)1) applies to each branch or 2) At least one SSV on the main and one on the branch shall incorporate a proof of closure interlock		
c) For multiple burner units the main burner shall be equipped as follows 1) <= 500 k safety shut off in b)1) applies to each individual line 2) >500K up to 12.5 million, either of the following applies		

a. SSV requirements in b)2) applies to each line b. SSV requirements in b)1) apply to each line and the main burner supply line has at least one SSV with proof of closure interlock.		
d) The valve seal overtravel (proof of closure) interlock shall prevent boiler ignition if the switch does not prove the valve closed during the startup		
e) Pilot supply line shall be equipped with at least one SSV		
f) SSVs labeled, listed by a national…		
g) SSVs shall have a shutoff time not to exceed that specified in Tables CF1-4		
h) SSV's shall be capable of withstanding a pressure not less than 10% above closest upstream OP device. If no OP device, the valves can withstand a pressure not less than maximum inlet to regulator		
i) Provisions to independently test each SSV for seal leakage. Any special equipment made available to boiler/burner mfgr.		

CF-190 – Vent, Bleed, Gas-pressure relief, vent valve, and feedback LINES for fuel train components.

a) Vent Lines 1) Regulators, combination controls, pressure interlock switches and all components requiring atmosphere air pressure shall have the atmospheric side of the diaphragm connected to a vent line that shall be pipe outside to a safe point of discharge as determined by the AHJ unless allowed in c) or h) below. 2) Where there is more than one fuel train component requiring a vent, each component shall have a separate vent piped outside to the	Yes. Maybe combine all into one paragraph. Vent or bleed lines coming from gas equipment such as regulators, controls, etc. shall be vented outside to a safe point of discharge. Sizing of vents, manifolding etc. should be per the applicable accepted standard. Vent to safe point of discharge per the standard or the AHJ.	

Commented [RA16]: I agree that CF-190 should be included in the NBIC and I also agree that it should be condensed similarly to what is described here.

safe place of discharge (per AHJ) unless otherwise permitted by f) or h).		
b) Bleed lines 1) Regulators, combination controls, pressure interlock switches and all components requiring atmosphere air pressure and periodically release gas shall have the atmospheric side of the diaphragm connected to a bleed line that shall be piped outside to a safe point of discharge as determined by the AHJ unless allowed in c) or h) below. 2) Where there is more than one fuel train components requiring a bleed line at a location, each component shall have a separate bleed line piped outside to the safe place of discharge (per AHJ) unless otherwise permitted by f) or h).		
c) *Components with Vent Limiters.* A listed and labeled gas-pressure regulator, etc. or other fuel train component incorporating a vent limiter shall be permitted to vent directly into ambient space		
d) Gas-pressure relief lines 1) If an OP device incorporates a gas-pressure relief device, the outlet shall be connected to a relief line piped outside to the safe place of discharge (per AHJ) 2) The relief line shall be sized in accordance with the component manufacturer's instructions and shall be at least the same size as the outlet connection of the relief valve 3) Where there is more than one gas-pressure relief valve, each relief valve shall have a separate line piped outside to the safe place of discharge (per AHJ) unless otherwise permitted by f).		
e) Lines from vent valves 1) A vent valve, if installed shall be piped outdoors to a safepoint of discharge as determined by the AHJ		

2) Vent line shall be >= to the outlet connection 3) Where there is more than one vent valve at a location, each vent valve shall be piped outside to the safe place of discharge (per AHJ) unless otherwise permitted by f).		
f) Manifolding of Lines If approved by the AHJ, same type lines (vent, bleed) shall be permitted and vent and bleed manifolding is permitted. To minimize backpressure, the manifolded line shall have a cross- sectional area of not less than the area of the largest branch line piped+ 50% of the additional cross-sectional areas. The following manifolding is not permitted 1) Gas-pressure relief with vent line, bleed lines or vent valve lines 2) Vent valve lines with vent lines or bleed lines 3) No vent lines of any type from one boiler to another		
g) Connecting lines to Flue Passages No vent lines of any type shall connect to a boilers flue passages		
h) Points of discharge: Outdoor requirements, special exceptions, and prohibited practices 1) Unless terminated per 2) or 4) all lines shall be piped outside to the safe place of discharge (per AHJ). The point of discharge shall be protected from foreign material. 2) A combination gas control integrating an internal gas bleed line shall be permitted to discharge its bleed line back into the valve body – if designed to not leak into burner. 3) If prone to floods, the discharge shall be protected (anti-flood or raise height) 4) A bleed or vent line can be discharged into a pilot if it is not a manifolded line and the discharge uses a burner tip. 5) Bleed or vent line shall not discharge into a positive pressure combustion chamber		

i) *Clearance for Points of Discharge* The point of discharge from the referenced vents piped outside shall have clearance as determined by the AHJ and the point of discharge shall extend above boiler and structures to prevent gaseous discharge from being drawn into combustion air intakes, ventilating systems, mechanical air intakes, windows of the boiler room or of an adjacent building.		
j) Burner tips 1) If used per h)4) – metal with a melting point of +1,450 F and its length shall extend from location in 3) to the outer wall of the combustion chamber. 2) Installer to document compliance and provide documention accompanying the boiler 3) Burner tip location shall be located so the gas is readily ignited and the tips securely held in relation to the pilot.		
k) Feedback Lines for Fuel Train components Feedback lines – Piped per manufacturer's instructions		
l) Bleed, Vent, and Relief lines All materials for these lines must be strong and durable enough and suitable for the environmental stresses. Materials shall be listed for intended purpose by a nationally recognized standard as accepted by the AHJ. In the absence of a standard NFPA 54 shall be used.		

Reminder

FROM NBIC PART 1

1.4.1 RESPONSIBILITY

a) The owner is responsible for satisfying jurisdictional requirements for certification and documentation. When required by jurisdictional rules applicable to the location of installation, the boilers, pressure vessels, piping, and other pressure-retaining items shall not be operated until the required documentation has been provided by the installer to the owner and the Jurisdiction.

b) The National Board Commissioned Inspector providing inservice inspection for the facility in which the

pressure-retaining item is installed has the following responsibilities:

1) Verify the *Boiler Installation Report* (I-1 Report) has been completed and signed by the installer, when required by the Jurisdiction;
2) Verify pressure-retaining items comply with the laws and regulations of the Jurisdiction governing
the specific type of boiler or pressure vessel;
3) Verify any repairs or alterations to pressure-retaining items, which are conducted prior to, or during,
the initial installation, are in accordance with the NBIC;
4) Request or assign jurisdictional identification number, when required by the Jurisdiction; and
5) Complete and submit the first inservice inspection/certificate report to the Jurisdiction when required
by the Jurisdiction.

c) Unless otherwise specifically required by the Jurisdiction, the duties of the inservice inspector do not include the installation's compliance with manufacturer's recommendations or applicability of, or compliance with, other standards and requirements (e.g., environmental, construction, electrical, undefined industry standards, etc.) for which other regulatory agencies have authority and responsibility to oversee.

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:

HG-607 Modular Steam Heating Boilers

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

(1) steam gage, see HG-602

(2) water gage glass, see HG-603

(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

(4) low water cutoff, see HG-606

(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).

(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.

CW-610 Water Level Controls for Modular Steam Heating Boilers

Modular steam heating boilers shall comply with CW-120, with the following differences:

(a) Each module shall be equipped with an automatic low-water fuel cutoff.

(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.

HG-606 Automatic Low-Water Fuel Cutoff and/or Water Feeding Device

(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.

(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.

(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.

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 (~~c~~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.

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

(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.

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.

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.

Commented [TB3]: Correct paragraph reference is 3.9.2

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

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.

NBIC Item # 20-86

NBIC Location: Part 1, 2.10.1 a) Testing and Acceptance: Boil Out

Recommended Verbiage – DP 1/14/21

It is recommended that a newly installed boiler(s) be boiled out. Its internal surfaces could be fouled with oil, grease, and/or other protective coatings from the manufacturing of the boiler. Boiling out will also remove any remaining mill scale, rust, welding flux, or other foreign matter normally associated with manufacturing or shipment. All contamination needs to be removed since it lowers the heat transfer rate and could cause localized overheating.

Existing boilers that have had any tube replacement, re-rolling or other extensive repairs to the pressure parts should also be boiled out. The lubricant used for rolling tubes, plus the protective coating on the new tubes, must be removed by boiling out before the repaired boiler can be put back on the line.

There are several methods used to perform the boil out operation. The boil out chemicals that are added to the water create a highly caustic solution, which upon heating dissolves the oils and greases and takes them into solution. After the period of boil out and blowing down the boiler, the concentration is diluted enough that practically all the oils and greases and other matter have been eliminated.

For new system installed the condensate return from the system should be dumped as this piping could also contain contaminants that could result in being put back into the boiler(s). The time for this should be determined on the size of the system.

Refer to the manufacturer and/or a chemical treatment company or specialist for the recommended chemicals and procedure to follow.

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: