Date Distributed:

THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

NATIONAL BOARD SUBGROUP INSTALLATION

AGENDA

Meeting of July 13th, 2021
Cincinnati, OH

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

1. **Call to Order**

   8:00 AM Eastern Time. For those attending in-person, the meeting room will be Salon F-G on the 4th floor.

2. **Introduction of Members and Visitors**

3. **Check for a Quorum**

4. **Awards/Special Recognition**

   Mr. Don Patten – 10 Years

5. **Announcements**

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

6. **Adoption of the Agenda**

7. **Approval of the Minutes of January 12th, 2021 Meeting**

   The minutes are available for review on the National Board website, www.nationalboard.org.

8. **Review of Rosters**

Subgroup Installation

Last Name	First Name	Interest Category	Role	Exp. Date	More
Patten	Don	Manufacturers	Chair	08/30/2021	Details
Wiggins	Edward	Jurisdictional Authorities	Vice Chair	08/30/2021	Details
Bock	Jeanne		Secretary	01/30/2099	Details
Anderson	William	Jurisdictional Authorities	Member	06/29/2022	Details
Austin	Randall	Users	Member	10/30/2022	Details
Brockman	Joe	Authorized Inspection Agencies	Member	01/30/2023	Details
Creacy	Todd	Authorized Inspection Agencies	Member	01/30/2023	Details
Downs	James	Manufacturers	Member	01/30/2023	Details
Jennings	Patrick	Authorized Inspection Agencies	Member	01/30/2023	Details
Konopacki	Stanley	Users	Member	01/30/2023	Details
Richards	H. Michael	General Interest	Member	08/30/2021	Details
Smith	Rex	Authorized Inspection Agencies	Member	01/30/2023	Details
Spiker	Ronald	Jurisdictional Authorities	Member	06/29/2022	Details
Wadkinson	Melissa	Manufacturers	Member	08/30/2021	Details
Washington	Milton	Jurisdictional Authorities	Member	07/30/2023	Details

a. Membership Nominations

Mr. Marvin Byrum (AIA), Mr. Gene Tompkins (Manufacturer), and Mr. Tom Clark (Jurisdictional Authorities) are interested in becoming a member of SG Installation.

b. Membership Reappointments

Mr. Don Patten, Mr. Eddie Wiggins, Mr. Mike Richards, and Ms. Melissa Wadkinson have memberships to the Subgroup that expire on August 30, 2021.

c. Officer Appointment

Mr. Don Patten's and Mr. Eddie Wiggins' terms as Chair and Vice Chair are set to end on August 30, 2021. They are both eligible for reappointment to the positions.

9. Open PRD Items Related to Installation

- 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.

10. Interpretations

Item Number: 20-84	**NBIC Location: Part 1, 3.7.5.1 d) 4)**	**Attachment Page 1**

General Description: Adjustable Packing on Low Pressure Boiler Stop Valves

Subgroup: SG Installation

Task Group: M. Wadkinson (PM), R. Spiker, and M. Downs

Explanation of Need: Jurisdictions need to know if this requirement applies to all low pressure boiler stop valves (steam, hot water heat, and hot water supply) so they can effectively communicate this requirement to their constituents and can enforce the code when new items are installed.

Background Information: Most new hot water heating boilers and hot water supply boilers are being installed with appropriately-pressure/temperature-rated butterfly valves as their outlet isolation valves. Most butterfly valves that are installed do not have adjustable pressure-type packing glands. Instead, these valves are supplied with EPDM or Viton seals inside the stem housing to prevent water escape. EPDM is rated to 275 F, and Viton is rated to 300 F. It is unclear whether or not the text of the referenced code is a requirement that is specifically intended to apply to water boilers, or if it is a requirement that has simply been in the code and has carried forward through the years. It is also unclear as to the safety basis for requiring adjustable packing for low pressure hot water boiler stop valves.

January 2021 Meeting Action: Progress Report – The SG held extensive discussions and spoke with Mr. Cantrell to get his input. It was decided that Melissa would take this to the Section IV meetings to be held in February 2021 and May 2021 due to the complexity of this topic. This interpretation will be pending what happens in these meetings. In the meantime a new item was opened (20-01) to address modifying the code.

Item Number: 21-23	NBIC Location: Part 1, S3.1	Attachment Page 2

General Description: Interpretation of scope on Install. of Liquid Carbon Dioxide Storage Vessel

Subgroup: SG Installation

Task Group: None assigned.

Explanation of Need: It is not clear in the NBIC if a closed loop CO2 refrigeration system would fall under this category. If so, this would prohibit the installation of the most common low GWP refrigerants being used for HVAC & refrigeration on stores.

Background Information: During his site inspection, an inspector in Tennessee stated that this code applies to the refrigeration system's flash tank installed in a machine house on top of a Publix grocery store roof. Since he has rejected it, building cannot continue, and this has jeopardized the build schedule. As stated above, this refrigerant is used all over the US in HVAC & refrigeration systems and is what the government is pushing us to reduce the GWP associated with refrigerants.

Item Number: 21-24	NBIC Location: Part 1, 3.7.5.1 b)	Attachment Page 3

General Description: Stop valves on boiler package that is isolated from system water

Subgroup: SG Installation

Task Group: None assigned.

Explanation of Need: A pool heating packaged manufactured by my employer has been rejected by an inspector because there are no stop valves on the supply and return of the boiler. The inspector references NBIC Part 1, 3.7.5.1 b)1). While clause 3.7.5.1 b)2) could provide an exception for use of stop valves, that is only valid when the boiler is located above the associated system piping.

Background Information: 3.7.5.1 b) 1) Stop valves shall be located at an accessible point in the supply and return pipe connections as near as is convenient at 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.

11. Action Items

Item Number: 20-27	NBIC Location: Part 1, 1.6.9 & S6.3	Attachment Pages 4-11

General Description: Carbon Monoxide Detector/Alarm NBIC 2019

Subgroup: SG Installation

Task Group: G. Tompkins (PM), R. Spiker, R. Smith, E. Wiggins, S. Konopacki, R. Austin, R. Troutt, and V. Newton

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?

January 2021 Meeting Action: Close w/no Action – G. Tompkins presented a proposal summarizing that this proposal was simply to provide further direction. The SG held extensive discussions and while it is recognized that this is a problem it is questioned "are we stepping out of the bounds of the NBIC?" With that said a motion was made to close this item with no action. The motion was unanimously approved.

Note: This item was not closed by Main Committee. Mr. Rob Troutt and Mr. Venus Newton volunteered to assist the task group with creating a proposal for this item.

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 2021 Meeting Action: Progress Report – M. Downs reported that the TG will report further progress on this item in the July 2021 meeting.

Item Number: 20-34	NBIC Location: Part 1	Attachment Page 12

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 2021 Meeting Action: Progress Report – P. Jennings presented a proposal. The SG held discussions and was in agreement that this proposal should be letter balloted to the SG for review and then letter balloted to the SC and MC for review and comment. There was a motion to letter ballot to the SG for review and then letter ballot to the SC and MC for review and comment. The motion was unanimously approved. This item is in conjunction with item 20-35.

Item Number: 20-35	NBIC Location: Part 1	Attachment Page 25

General Description: Installation requirements for Fuel Oil Trains

Subgroup: SG Installation

Task Group: G. Tompkins (PM), D. Patten, M. Washington

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

January 2021 Meeting Action: Progress Report – G. Tompkins presented a proposal. The SG held discussions and made a revision (changing requirements to recommendations) and was in agreement that the revised proposal should be letter balloted to the SG for review of wording. It was suggested that the numbering should be in the same structure as item 20-34's proposal. There was a motion to letter ballot to the SG for review of wording. The motion was unanimously approved. This item is in conjunction with item 20-34.

Item Number: 20-39	NBIC Location: Part 1	No Attachment

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 2021 Meeting Action: Progress Report – It was reported that there has been no progress on this item pending the update of Section IV. Melissa will check on the status of the update of Section IV and will get back with an update and/or a proposal for the July 2021 NBIC SG meeting.

Item Number: 20-41	NBIC Location: Part 1	Attachment Page 26

General Description: Safety and Safety Relief Valves for Steam and Hot Water Heating Boilers.

Subgroup: SG Installation

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

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

January 2021 Meeting Action: Progress Report – PRD submitted comments on our proposal from the July 2020 meeting. Extensive discussions were held amongst the SG on PRD's comments on the proposal. This item is being worked on in conjunction with item 20-43. After extensive discussions it was decided that G. Scribner will follow-up with PRD on some concerns before approving the proposal. This was communicated to T. Beirne of PRD – Part 4.

Item Number: 20-43	NBIC Location: Part 1	Attachment Page 27

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 2021 Meeting Action: Progress Report – PRD submitted comments on our proposal from the July 2020 meeting. Extensive discussions were held amongst the SG on PRD's comments on the proposal. This item is being worked on in conjunction with item 20-41. After extensive discussions it was decided that G. Scribner will follow-up with PRD on some concerns before approving the proposal. This was communicated to T. Beirne of PRD – Part 4.

Item Number: 20-44	NBIC Location: Part 1	Attachment Page 28

General Description: CW Vacuum Boilers

Subgroup: SG Installation

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

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

January 2021 Meeting Action: Progress Report – The TG was updated to remove K. Watson & P. Jennings and add R. Spiker as (PM) and M. Byrum. A brief summary was presented by G. Scribner and discussion was held amongst the SG.

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 2021 Meeting Action: Progress Report – A TG was assigned being T. Clark (PM), E. Wiggins, R. Spiker, T. Creacy, P. Jennings, G. Tompkins, and D. Patten. An overview summary of the JRS system and the need for updated forms was presented by G. Scribner and discussion was held amongst the SG.

Item Number: 20-86	NBIC Location: Part 1, 2.10.1 a)	No Attachment

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 2021 Meeting Action: Progress Report – A TG was assigned being E. Wiggins (PM), D. Patten, M. Washington and S. Konopacki. An overview summary was presented by E. Wiggins of why this item came about and discussion was held amongst the SG.

12. New Items:

Item Number: 21-01	NBIC Location: Part 1, 3.7.5.1 d)	Attachment Page 29

General Description: Add verbiage for use of Valves that do not have adjustable packing

Subgroup: SG Installation

Task Group: None assigned.

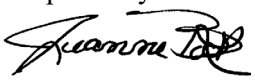
Explanation of Need: Add verbiage for use of Valves that do not have adjustable packing. Not for steam use.

13. Future Meetings

- January 18-21, 2022 – San Diego, CA
- July 2022 – TBD

14. Adjournment

Respectfully submitted,



Jeanne Bock
NBIC Part 1 Secretary

PROPOSED INTERPRETATION

Inquiry No.	**20-84**
Source	Chris Cantrell, State of Nebraska Christopher.Cantrell@nebraska.gov
Subject	Adjustable Packing on Low Pressure Boiler Stop Valves **Background:** Most new hot water heating boilers and hot water supply boilers are being installed with appropriately-pressure/temperature-rated butterfly valves as their outlet isolation valves. Most butterfly valves that are installed do not have adjustable pressure-type packing glands. Instead, these valves are supplied with EPDM or Viton seals inside the stem housing to prevent water escape. EPDM is rated to 275 F, and Viton is rated to 300 F. It is unclear whether or not the text of the referenced code is a requirement that is specifically intended to apply to water boilers, or if it is a requirement that has simply been in the code and has carried forward through the years. It is also unclear as to the safety basis for requiring adjustable packing for low pressure hot water boiler stop valves.
Edition	**Part 1, 3.7.5.1 d) 4)**
Question	Does the requirement in NBIC, Part 1, Section 3, paragraph 3.7.5.1(d)(4) that all valves or cocks with stems or spindles shall have adjustable pressure-type packing glands apply to stop valves used on low pressure hot water heating or hot water supply boilers?
Reply	No. This requirement applies to stop valves used on low pressure steam boilers only.
Committee's Question	
Committee's Reply	
Rationale	

PROPOSED INTERPRETATION

Inquiry No.	**21-23**
Source	Joseph Richardson, Dover Food Retail jrichardson@doverfoodretail.com
Subject	Interpretation of scope on Install. of Liquid Carbon Dioxide Storage Vessel **Background:** It is not clear in the NBIC if a closed loop CO2 refrigeration system would fall under this category. If so, this would prohibit the installation of the most common low GWP refrigerants being used for HVAC & refrigeration on stores. During a site inspection, an inspector in Tennessee stated that this code applies to the refrigeration system's flash tank installed in a machine house on top of a Publix grocery store roof. Since he has rejected it, building cannot continue and this has jeopardized the build schedule. As stated above, this refrigerant is used all over the US in HVAC & refrigeration systems and is what the government is pushing us to to reduce the GWP associated with refrigerants.
Edition	**Part 1, S3.1**
Question	Does the flash tank on an enclosed refrigeration system fall under the scope of this listing since it is a closed loop system that is not refilled?
Reply	No.
Committee's Question	
Committee's Reply	
Rationale	

PROPOSED INTERPRETATION

Inquiry No.	**21-24**
Source	Jeff Kleiss, Lochinvar, LLC jkleiss@lochinvar.com
Subject	Stop valves on boiler package that is isolated from system water **Background:** A pool heating packaged manufactured by my employer has been rejected by an inspector because there are no stop valves on the supply and return of the boiler. The inspector references NBIC Part 1, 3.7.5.1 b)1). While clause 3.7.5.1 b)2) could provide an exception for use of stop valves, that is only valid when the boiler is located above the associated system piping.
Edition	**Part 1, 3.7.5.1 b)**
Question	When a boiler is part of a package with an indirect heat exchanger that isolates the boiler from the primary system water are the stop valves mentioned in NBIC Part 1, 3.7.5.1 b)1) required to be installed on the boiler supply and return?
Reply	No.
Committee's Question	
Committee's Reply	
Rationale	

Supplement 10

Installation of Carbon Monoxide Detectors in Boiler Rooms

S10.1 Scope

Carbon Monoxide (CO) is a poisonous, colorless, odorless and tasteless gas that can cause injury and even death if not detected. Statistics show about 400 deaths and 10,000 hospitalizations each year from non-fire related CO incidents. High levels of CO can be an indication of poor combustion leading to inefficient operation resulting in increased fuel usage and emissions or improperly installed or corroded flue piping.

All boiler mechanical rooms containing one or more boilers and/or pressure vessels from which carbon monoxide can be produced should be equipped with a carbon monoxide detector that can meet the criteria below.

S10.2 General Requirements for Installation of Carbon Monoxide Detector

It is recommended a carbon monoxide detector and any PRI that can produce CO should be interlocked to stop the production of CO by disabling all equipment capable of producing CO in the space the equipment is installed.

(a) (C) The CO Detector should be interlocked to disable all PRI's capable of producing CO in the space the PRI is installed when the detector trips.

(A)CO Detectors without remote monitoring in the space where CO is capable of being produced.

(1) The CO Detector should be of the manual reset type

(2) The CO Detector should set to alarm and trip at 50 PPM. [JF1]

(B) CO Detectors provided with remote monitoring in the space where CO is capable of being produced.

(1) The CO Detector should be of the manual reset type.

(2) The CO Detector should be set to alarm at 50 PPM

(3) The CO Detector should set to trip at 200 PPM. [JF2]

(c) When the CO Detector trips in (a) or (b) above, the detector should be interlocked

with all PRI’s installed in the space to secure the PRI’s, thus stopping the production of CO.

(d) The carbon monoxide detector should be calibrated in accordance with the manufacturer's recommendations or every eighteen months after installation of the detector. A record of calibration should be identified on the CO Detector.

SECTION915
CARBON MONOXIDE DETECTION

[F]915.1General.
CDP
Carbon monoxide detection shall be installed in new buildings in accordance with Sections 915.1.1 through 915.6. Carbon monoxide detection shall be installed in existing buildings in accordance with Chapter 11 of the *International Fire Code*.

[F]915.1.1Where required.
Carbon monoxide detection shall be provided in Group I-1, I-2, I-4 and R occupancies and in classrooms in Group E occupancies in the locations specified in Section 915.2 where any of the conditions in Sections 915.1.2 through 915.1.6 exist.

[F]915.1.2Fuel-burning appliances and fuel-burning fireplaces.
Carbon monoxide detection shall be provided in *dwelling units*, *sleeping units* and classrooms that contain a fuel-burning appliance or a fuel-burning fireplace.

[F]915.1.3Fuel burning, forced-air furnaces.
Carbon monoxide detection shall be provided in dwelling units, sleeping units and classrooms served by a fuel-burning, forced-air furnace.

Exception: Carbon monoxide detection shall not be required in *dwelling units*, *sleeping units* and classrooms if a carbon monoxide detector is provided in the first room or area served by each main duct leaving the furnace, and the carbon monoxide alarm signals are automatically transmitted to an approved location.

[F]915.1.4Fuel-burning appliances outside of dwelling units, sleeping units and classrooms.
Carbon monoxide detection shall be provided in *dwelling units*, *sleeping units* and classrooms located in buildings that contain fuel-burning appliances or fuel-burning fireplaces.

Exceptions:

1. Carbon monoxide detection shall not be required in *dwelling units*, *sleeping units* and classrooms without communicating openings between the fuel-burning appliance or fuel-burning fireplace and the *dwelling unit*, *sleeping unit* or classroom.
2. Carbon monoxide detection shall not be required in *dwelling units*, *sleeping units* and classrooms where a carbon monoxide detector is provided in one of the following locations:
   2.1. In an *approved* location between the fuel-burning appliance or fuel-burning fireplace and the *dwelling unit*, *sleeping unit* or classroom.
   2.2. On the ceiling of the room containing the fuel-burning appliance or fuel-burning fireplace.

[F]915.1.5Private garages.
Carbon monoxide detection shall be provided in *dwelling units*, *sleeping units* and classrooms in buildings with attached *private garages*.

Exceptions:

1.Carbon monoxide detection shall not be required in dwelling units, sleeping units and classrooms without communicating openings between the *private garage* and the *dwelling unit, sleeping unit* or classroom.
2.Carbon monoxide detection shall not be required in *dwelling units, sleeping units* and classrooms located more than one *story* above or below a *private garage*.
3.Carbon monoxide detection shall not be required where the *private garage* connects to the building through an *open-ended corridor*.
4.Where a carbon monoxide detector is provided in an *approved* location between openings to a *private garage* and *dwelling units, sleeping units* or classrooms.

[F]915.1.6Exempt garages.
For determining compliance with Section 915.1.5, an *open parking garage* complying with Section 406.5 or an enclosed parking garage complying with Section 406.6 shall not be considered a *private garage*.

[F]915.2Locations.
Where required by Section 915.1.1, carbon monoxide detection shall be installed in the locations specified in Sections 915.2.1 through 915.2.3.

[F]915.2.1Dwelling units.
Carbon monoxide detection shall be installed in *dwelling units* outside of each separate sleeping area in the immediate vicinity of the bedrooms. Where a fuel-burning appliance is located within a bedroom or its attached bathroom, carbon monoxide detection shall be installed within the bedroom.

[F]915.2.2Sleeping units.
CDP
Carbon monoxide detection shall be installed in *sleeping units*.
Exception: Carbon monoxide detection shall be allowed to be installed outside of each separate sleeping area in the immediate vicinity of the *sleeping unit* where the *sleeping unit* or its attached bathroom does not contain a fuel-burning appliance and is not served by a forced air furnace.

[F]915.2.3Group E occupancies.
Carbon monoxide detectors shall be installed in classrooms in Group E occupancies. Carbon monoxide alarm signals shall be automatically transmitted to an on-site location that is staffed by school personnel.

Exception: Carbon monoxide alarm signals shall not be required to be automatically transmitted to an on-site location that is staffed by school personnel in Group E occupancies with an *occupant load* of 30 or less.

[F]915.3Carbon monoxide detection.
Carbon monoxide detection required by Sections 915.1 through 915.2.3 shall be provided by carbon monoxide alarms complying with Section 915.4 or carbon monoxide detection systems complying with Section 915.5.

[F]915.4Carbon monoxide alarms.

Carbon monoxide alarms shall comply with Sections 915.4.1 through 915.4.4.

[F]915.4.1Power source.
Carbon monoxide alarms shall receive their primary power from the building wiring where such wiring is served from a commercial source, and when primary power is interrupted, shall receive power from a battery. Wiring shall be permanent and without a disconnecting switch other than that required for overcurrent protection.

Exception: Where installed in buildings without commercial power, battery-powered carbon monoxide alarms shall be an acceptable alternative.

[F]915.4.2Listings.
Carbon monoxide alarms shall be listed in accordance with UL 2034.

[F]915.4.3Locations.
Carbon monoxide alarms shall only be installed in *dwelling units* and in *sleeping units*. They shall not be installed in locations where the code requires carbon monoxide detectors to be used.

[F]915.4.4Combination alarms.
Combination carbon monoxide/smoke alarms shall be an acceptable alternative to carbon monoxide alarms. Combination carbon monoxide/smoke alarms shall be listed in accordance with UL 217 and UL 2034.

[F]915.5Carbon monoxide detection systems.
CDP
Carbon monoxide detection systems shall be an acceptable alternative to carbon monoxide alarms and shall comply with Sections 915.5.1 through 915.5.3.

[F]915.5.1General.
CDP
Carbon monoxide detection systems shall comply with NFPA 720. Carbon monoxide detectors shall be *listed* in accordance with UL 2075.

[F]915.5.2Locations.
CDP
Carbon monoxide detectors shall be installed in the locations specified in Section 915.2. These locations supersede the locations specified in NFPA 720.

[F]915.5.3Combination detectors.
CDP
Combination carbon monoxide/smoke detectors installed in carbon monoxide detection systems shall be an acceptable alternative to carbon monoxide detectors, provided that they are listed in accordance with UL 268 and UL 2075.

[F]915.6Maintenance.
Carbon monoxide alarms and carbon monoxide detection systems shall be maintained in accordance with the *International Fire Code*.

OSHA FactSheet

Carbon Monoxide Poisoning

Carbon monoxide (CO) is a poisonous, colorless, odorless and tasteless gas. Although it has no detectable odor, CO is often mixed with other gases that do have an odor. So, you can inhale carbon monoxide right along with gases that you can smell and not even know that CO is present.

CO is a common industrial hazard resulting from the incomplete burning of material containing carbon such as natural gas, gasoline, kerosene, oil, propane, coal, or wood. Forges, blast furnaces and coke ovens produce CO, but one of the most common sources of exposure in the workplace is the internal combustion engine.

How does CO harm you?

Carbon monoxide is harmful when breathed because it displaces oxygen in the blood and deprives the heart, brain and other vital organs of oxygen. Large amounts of CO can overcome you in minutes without warning — causing you to lose consciousness and suffocate.

Besides tightness across the chest, initial symptoms of CO poisoning may include headache, fatigue, dizziness, drowsiness, or nausea. Sudden chest pain may occur in people with angina. During prolonged or high exposures, symptoms may worsen and include vomiting, confusion and collapse in addition to loss of consciousness and muscle weakness. Symptoms can vary widely from person to person. CO poisoning may occur sooner in those most susceptible: young children, the elderly, people with lung or heart disease, people at high altitudes, or those who already have elevated CO blood levels, such as smokers. Also, CO poisoning poses a special risk to fetuses.

CO poisoning can be reversed if caught in time. But even if you recover, acute poisoning may result in permanent damage to the parts of your body that require a lot of oxygen such as the heart and brain. Significant reproductive risk is also linked to CO.

Who is at risk?

You may be exposed to harmful levels of CO in boiler rooms, warehouses, petroleum refineries, pulp and paper production, and steel production; around docks, blast furnaces, or coke ovens; or in one of the following occupations:

- Welder
- Garage mechanic
- Firefighter
- Carbon-black maker
- Organic chemical synthesizer
- Metal oxide reducer
- Longshore worker
- Diesel engine operator
- Forklift operator
- Marine terminal worker
- Toll booth or tunnel attendant
- Customs inspector
- Police officer
- Taxi driver

What can you do if you suspect that someone has been poisoned with CO?

When you suspect CO poisoning, promptly taking the following actions can save lives:

- Move the victim immediately to fresh air in an open area.
- Call 911 or another local emergency number for medical attention or assistance.
- Administer 100 percent oxygen using a tight-fitting mask if the victim is breathing.

- Administer cardiopulmonary resuscitation if the victim has stopped breathing.

Warning: You may be exposed to fatal levels of CO poisoning in a rescue attempt. Rescuers should be skilled at performing recovery operations and using recovery equipment. Employers should make sure that rescuers are not exposed to dangerous CO levels when performing rescue operations.

How can employers help prevent CO poisoning?

To reduce the chances of CO poisoning in the workplace, employers should take the following actions:

- Install an effective ventilation system that will remove CO from work areas.
- Maintain equipment and appliances (e.g., water heaters, space heaters, cooking ranges) that can produce CO in good working order to promote their safe operation and to reduce CO formation.
- Consider switching from gasoline-powered equipment to equipment powered by electricity, batteries, or compressed air if it can be used safely.
- Prohibit the use of gasoline-powered engines or tools in poorly ventilated areas.
- Provide personal CO monitors with audible alarms if potential exposure to CO exists.
- Test air regularly in areas where CO may be present, including confined spaces. See Title 29 of the Code of Federal Regulations (CFR) 1910.146.
- Use a full-facepiece pressure-demand self-contained breathing apparatus (SCBA) certified by the National Institute for Occupational Safety and Health (NIOSH), or a combination full-facepiece pressure demand supplied-air respirator with auxiliary self-contained air supply in areas with high CO concentrations, i.e., those with immediately dangerous to life and health atmospheres. (See 29 CFR 1910.134.)
- Use respirators with appropriate canisters, in conjunction with personal CO monitoring, for short periods under certain circumstances where CO levels are not exceedingly high.
- Educate workers about the sources and conditions that may result in CO poisoning as well as the symptoms and control of CO exposure.

In addition, if your employees are working in confined spaces where the presence of CO is suspected, you must ensure that workers test for oxygen sufficiency before entering.

What can employees do to help prevent CO poisoning?

Employees should do the following to reduce the chances of CO poisoning in the workplace:

- Report any situation to your employer that might cause CO to accumulate.
- Be alert to ventilation problems — especially in enclosed areas where gases of burning fuels may be released.
- Report promptly complaints of dizziness, drowsiness, or nausea.
- Avoid overexertion if you suspect CO poisoning and leave the contaminated area.
- Tell your doctor that you may have been exposed to CO if you get sick.
- Avoid the use of gas-powered engines, such as those in powered washers as well as heaters and forklifts, while working in enclosed spaces.

What are the OSHA standards for CO exposure?

- The OSHA PEL for CO is 50 parts per million (ppm). OSHA standards prohibit worker exposure to more than 50 parts of CO gas per million parts of air averaged during an 8-hour time period.
- The 8-hour PEL for CO in maritime operations is also 50 ppm. Maritime workers, however, must be removed from exposure if the CO concentration in the atmosphere exceeds 100 ppm. The peak CO level for employees engaged in Ro-Ro operations (roll-on roll-off operations during cargo loading and unloading) is 200 ppm.

Workers' Rights

Workers have the right to:

- Working conditions that do not pose a risk of serious harm.
- Receive information and training (in a language and vocabulary the worker understands) about workplace hazards, methods to prevent them, and the OSHA standards that apply to their workplace.
- Review records of work-related injuries and illnesses.

- File a complaint asking OSHA to inspect their workplace if they believe there is a serious hazard or that their employer is not following OSHA's rules. OSHA will keep all identities confidential.
- Exercise their rights under the law without retaliation, including reporting an injury or raising health and safety concerns with their employer or OSHA. If a worker has been retaliated against for using their rights, they must file a complaint with OSHA as soon as possible, but no later than 30 days.

For additional information, see OSHA's Workers page (www.osha.gov/workers).

How to Contact OSHA

Under the Occupational Safety and Health Act of 1970, employers are responsible for providing safe and healthful workplaces for their employees. OSHA's role is to help ensure these conditions for America's working men and women by setting and enforcing standards, and providing training, education and assistance. For more information, visit www.osha.gov or call OSHA at 1-800-321-OSHA (6742), TTY 1-877-889-5627.

This is one in a series of informational fact sheets highlighting OSHA programs, policies or standards. It does not impose any new compliance requirements. For a comprehensive list of compliance requirements of OSHA standards or regulations, refer to Title 29 of the Code of Federal Regulations. This information will be made available to sensory-impaired individuals upon request. The voice phone is (202) 693-1999; teletypewriter (TTY) number: (877) 889-5627.

U.S. Department of Labor

OSHA® Occupational Safety and Health Administration

DSG FS-3522 04/2012

ITEM 20-34 Venting.

PROPOSED CHANGES

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.

a) Natural Gas
   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 [RA1][JP-H2] controls.
   2) Manual Valves
      a. A manual valve is required upstream of all controls and as close as practical to [JP-H3]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[RA4][JP-H5] 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
      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 requirements of the manufacturer 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. [RA6][JP-H7]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 - By others

BACKGROUND INFORMATION

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)	YES

	safety controls, safety limit switches and controls, and burners or electric elements as required 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[RA8].
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[RA9]

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 [RA10] 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.

CF-160 – Gas pressure Regulators [RA11]

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 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	See CF-160 No – Even if we do agree that switches should be included.	

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 safe place of discharge (per AHJ) unless otherwise permitted by f) or h).	Yes. Maybe combine all into one paragraph.[RA12] 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.	
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.

Oil burners

1.6.5 FUEL

All fuel systems shall be installed in accordance with jurisdictional and environmental requirements, manufacturer's recommendations, and/or industry standards as applicable

1.6.5.1 Gas Fuel Requirements (I am assuming this is needs to be added)

1.6.5.2 Oil Fuel Requirements

The installer shall provide and install any additional components required for proper burner operation but not provided with the listed burner. These shall include but not limited to:

a) **A filter or strainer shall be installed upstream of the safety shutoff valves. The filter or strainer shall meet the manufacturer's recommendations and installed in accordance with jurisdictional and environmental requirements and/or industry standards, as applicable.**

b) **An atomizing medium shall be installed according to the manufacturer's recommendations and in accordance with jurisdictional and environmental requirements and/or industry standards, as applicable.**

c) **A pressure relief valve shall be connected to a fuel line in which the pressure greater than the system design pressure may occur. The relief valve line from the relief valve shall discharge into the return line, oil tank or pump suction line.**

In Section 9.1 Definitions

Atomizing Medium – A medium used to help atomize fuel oil, typically air or steam

Note – material in italics is not part of the existing and recommended wording, and are for general information only.

Rational

The standards (UL 296) do not require that a listed burner include the above items. Details of the atomizing medium and strainer/filter must be included by the burner manufacturer, but the manufacturer does not need to include the equipment.

The atomizing medium (usually air or steam) is required with some burners, while many other oil burners will use pressure atomization (and do not require a separate atomizing medium). The manufacturer is not required to provide this, but it is required to properly operate. CSD-1 does not specifically call this out, but is included here as a essential item for the installer to provide.

The relief valve becomes an issue when the oil is supplied by a pump, and that the pressure could become too high for the burner to handle safely.

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[TB1]) Pressure relief valve shall be manufactured in accordance with a national or international standard and be certified for capacity ~~or flow resistance~~[TB2] by the National Board.

3.9.2 ~~(a)~~[TB3] 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~~[TB4] by the National Board.

(b) The following general requirements pertain to installing, mounting and connecting pressure relief valves on heating boilers.[TB5]

(Note: certified for capacity or flow resistance by the NB is referenced in 4.5.1(a))[TB6]

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~~ [TB1] by the National Board.

(Note: certified for capacity or flow resistance by the NB is referenced in Part 1, 4.5.1(a)) [TB2]

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.

It is intended that the number be **3.8.1.7** and that the item currently **3.8.1.7** becomes **3.8.1.8**

3.8.1.7 Vacuum Boilers

Vacuum Boilers shall be provided with instruments, fittings and controls in accordance with Section 3.8 but are exempt from the following requirements if pressure and temperature controls are installed as described in 3.8.1.7 below:

3.8.1.2 Water-Gage Glasses
3.8.1.3 Water Column and Water Level Control Piping
3.8.1.4 Pressure Control
3.8.1.5 Auto Low Water Cut-Off and /or Water feeding device
3.7.7 Blow Off and Drain Valves

The exemptions are allowed only when the following controls are installed:

a) Pressure Control – Each boiler shall have a pressure control that interrupts the burner operation in response to boiler pressure. This pressure control shall be set from 2.5 psig (17 kpa) to 14.7 psig (101 kpa).
b) Temperature Control- Each boiler shall have two temperature controls responsive to boiler temperature that interrupt burner operation. One shall operate at a temperature below 210'F (99'C). The other shall at a temperature not exceeding 210'F (99'C) and shall cause a safety shutdown and lockout.
c) Safety Relief Valves - Each boiler shall have a properly sized safety valve and shall conform to the following.
    1. Have no test lever
    2. Be set to a maximum pressure of 7.1 psig (49 kpa).
    3. ASME Boiler and Pressure Vessel Code Section IV

PROPOSED REVISION OR ADDITION

Item No.

21-01

Subject/Title

Add verbiage for use of Valves that do not have adjustable packing

NBIC Location

Part: Installation; Section: 3.7.5.1; Paragraph: d)

Project Manager and Task Group

Source (Name/Email)

Don Patten / boilerserviceman@comcast.net

Statement of Need

Add verbiage for use of Valves that do not have adjustable packing. Not for steam use.

Background Information

In response to 20-84 Interpretation we have opened action item 21-01 to add verbiage for use of Valves that do not have adjustable packing.

Existing Text

Proposed Text

TBD

	VOTE:						
COMMITTEE	Approved	Disapproved	Abstained	Not Voting	Passed	Failed	Date