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THE
NATIONAL
BOARD
OF BOILER AND
PRESSURE VESSEL
INSPECTORS

NATIONAL BOARD SUBCOMMITTEE INSTALLATION

MINUTES

Meeting of January 13, 2016
Corpus Christi, TX

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The National Board of Boiler & Pressure Vessel Inspectors
1055 Crupper Avenue
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1. Call to Order

Chair, M. Richards, called the meeting to order at 8:00 a.m.

2. Introduction of Members and Visitors

Introductions took place amongst all members and visitors and an attendance sheet was circulated for review and check off.

- Paul Bourgeois should be removed as he has retired.

With the attached roster a quorum was established. There was a motion to approve the roster as published with the noted deletion. The motion was unanimously approved.

3. Announcements

- Wednesday Evening – Reception held at the USS Lexington.
- Thursday Morning – Breakfast provided / 7:00 am – 8:00 am.
- Thursday Afternoon – Lunch provided / 11:30 am – 12:30 pm in room Bayview.
- The group was informed on the procedures for the following: Naming of Files, Letter Ballot failures due to lack of participation, Action Item history on Agendas, and the use of breakout sessions.

4. Adoption of the Agenda

- Item NB15–2303. The TG should be listed as M. Washington (PM), and T. Creacy.
- Item NB15–0107. The TG should be listed as M. Wadkinson (PM), B. Moore, S. Konopacki.

There was a motion to adopt the Agenda as published with the added correction. The motion was unanimously approved.

5. Approval of the Minutes

There was a motion to approve the Minutes of July 15, 2015 as published. The motion was unanimously approved.

6. Review of the Roster (Attachment Page 1)

a. Membership Nominations

- There are no nominations for new members to SG Installation.

b. Membership Reappointments

- Mr. Paul Schuelke is eligible for reappointment to SG Installation. A vote will be taken.

There was a motion to reappoint Mr. Paul Schuelke to the SG Installation. The motion was unanimously approved

c. Officer Selection

- There are no SG Installation officer positions that require a vote at this meeting.

7. Old Business

i. Interpretations

Item Number: IN15-0801	NBIC Location: Part 1, 3.3.4	Attachment Pages 2-4
General Description: Installation of boilers with 1 inch side clearance based on manufacturer recommendation.		
Subgroup: Installation		
Task Group: None assigned		
Meeting Action: The SC discussed and reviewed the submitted interpretation and the revised question and response approved by the SG. There was a motion to approve this proposed revised question and response. The motion was unanimously approved.		

ii. Action Items – Old Business

Item Number: NB10-1201	NBIC Location: Part 1	Attachment Pages 5-19
General Description: Reformat NBIC Part 1 by expanding the general requirements section		
Subgroup: Installation		
Task Group: M. Wadkinson (PM), B. Moore, S. Konopacki, E. Wiggins, D. Patten		
Meeting Action: M. Wadkinson provided a proposal on the cloud that was presented in the SG meeting. The SG held extensive discussions, making modifications to this proposal. The revised proposal was presented to the SG and approved. There was a motion to approve this revised proposal to the MC for letter ballot. The motion was unanimously approved. A new Action Item (NB16-0102) was created to address pressure and system testing.		

Item Number: NB11-1901	NBIC Location: Part 1	No Attachment
General Description: Add guidance for the safe installation of high pressure composite pressure vessels operating in close proximity to the public		
Subgroup: FRP		
Task Group: M. Richards (PM), S. Konopacki and D. Patten		
Meeting Action: Mr. Richards presented a brief summary of this item and that work continues to progress.		

Item Number: NB12-0302	NBIC Location: Part 1	No Attachment
<p>General Description: Add installation requirements for pressure vessels for human occupancy (PVHOs)</p> <p>Subgroup: Installation</p> <p>Task Group: B. Moore (PM), T. Creacy, K. Watson, T. Millette, M. Richards, G. Scribner</p> <p>Meeting Action: Mr. K. Watson should be removed from the TG. B. Moore presented a revision proposal open for discussion in the July 2015 SG & SC meetings and was expected to present a revised proposal. However, due to the unexpected absence of Mr. Moore, there is no progress to be presented at this time.</p>		

Item Number: NB13-1101	NBIC Location: Part 1	Attachment Pages 20-22
<p>General Description: Add installation requirements for condensing hot water boilers</p> <p>Subgroup: Installation</p> <p>Task Group: G. Halley (PM), M. Wadkinson, D. Patten, B. Moore, T. Millete, P. Bourgeois</p> <p>Meeting Action: Mr. P. Bourgeois should be removed from this TG. This proposal was passed in the MC meeting in July 2015. However, due to lack of participation/letter ballot votes, this item did not pass. There were comments by Don Cook, Rob Troutt and Joel Amato not in favor of this proposal. The TG held a breakout session to discuss the concerns given by the commenters, resulting in a further revised proposal. This revised proposal was reviewed with the SG and the commenters. The SC made additional revisions and a motion was made to move the revised proposal to the MC for approval. The motion was unanimously approved. A new Action Item (NB16-0101) was created to address carbon monoxide detectors/alarms for mechanical rooms.</p>		

Item Number: NB14-0403	NBIC Location: Part 1	No Attachment
<p>General Description: Identify terms from Part 1 that need to be added to the index</p> <p>Subgroup: Installation</p> <p>Task Group: B. Moore (PM), M. Richards, T. Creacy, K. Watson, M. Washington</p> <p>Meeting Action: Mr. K. Watson should be removed from the TG. B. Moore presented a proposal open for discussion in the July 2015 SG & SC meetings and was expected to present a revised proposal. However, due to the unexpected absence of Mr. Moore, there is no progress to be presented at this time. The SG did hold discussions and will continue refining to identify key factors of the following: 1. Is it relevant to the index, 2. Should wording be changed and if so will it still be required to be added to the index, 3. Is what is being requested to be added to the index beneficial, etc....</p>		

Item Number: NB15-0106	NBIC Location: Part 1, 3.7.5.1	No Attachment
<p>General Description: To address Figure 3.7.5.1</p> <p>Subgroup: Installation</p> <p>Task Group: B. Moore (PM), T. Creacy, M. Washington, and <u>R. Austin</u></p> <p>Meeting Action: Mr. R. Austin is to be added to the TG. It was reported that there is no progress at this time due to awaiting ASME changes.</p>		

Item Number: NB15-0107	NBIC Location: Part 1, 3.8.2.3	Attachment Pages 23-24
<p>General Description: To address 3.8.2.3 with BPV IV and CSD-1</p> <p>Subgroup: Installation</p> <p>Task Group: M. Wadkinson (PM), <u>B. Moore, S. Konopacki</u></p> <p>Meeting Action: The TG should be listed to include B. Moore and S. Konopacki. M. Wadkinson provided a proposal on the cloud that was presented in the SG meeting. The SG reviewed, held discussions and approved this proposal. There was a motion to approve this proposal. The motion was unanimously approved.</p>		

Item Number: NB15-0108	NBIC Location: Part 1	No Attachment
<p>General Description: Add a supplement to address high temperature hot water boilers.</p> <p>Subgroup: Installation</p> <p>Task Group: M. Wadkinson (PM), B. Moore, T. Creacy, and D. Patten, P. Bourgeois</p> <p>Meeting Action: P. Bourgeois should be removed from the TG It was reported that M. Wadkinson is working on a proposal to present by the July 2016 meeting. She was not in attendance at this meeting.</p>		

Item Number: NB15-1001	NBIC Location: Part 1	No Attachment
<p>General Description: Update “stamp” vs. “certification” language to maintain consistency with ASME code</p> <p>Subgroup: Installation</p> <p>Task Group: P. Bourgeois (PM), K. Watson, M. Richards, M. Wadkinson</p> <p>Meeting Action: P. Bourgeois and K. Watson should be removed from the TG The SG reviewed the language in Part 1 and determined that the use of “stamp” vs. “certification” is not applicable within Part 1. There was a motion to close this item with no action needed. The motion was unanimously approved.</p>		

Item Number: NB15-1302	NBIC Location: Part 1, 2.8.1	Attachment Pages 25
<p>General Description: Why aren't low water cutoffs required to have manual resets in Part 1, 2.8.1? Manual resets are required in NBIC Part 1 Section 3 and CSD-1 Article CW-140</p> <p>Subgroup: Installation</p> <p>Task Group: T. Millete (PM), M. Wadkinson, B. Moore, T. Creacy, K. Watson</p> <p>Meeting Action: K. Watson should be removed from the TG M. Wadkinson submitted a proposal on the cloud that was presented to the SG. She states "this wording is for Steam (vapor) only. The high temp hot water will be addressed under NB15-0108". The SG reviewed, discussed and approved this proposal to move to the SC to be moved to the MC. There was a motion to approve this proposal. The motion was unanimously approved.</p>		

Item Number: NB15-2202	NBIC Location: Part 1	No Attachment
<p>General Description: Add checklist for the safe installation of high pressure composite pressure vessels operating in close proximity to the public</p> <p>Subgroup: FRP</p> <p>Task Group: B. Moore (PM)</p> <p>Meeting Action: B. Moore was expected to present a proposal this meeting. However, due to the unexpected absence, there is no progress to be presented at this time.</p>		

Item Number: NB15-2303	NBIC Location: Part 1	Attachment Pages
<p>General Description: Review NBIC footnotes; remove footnotes that are code language or definitions</p> <p>Subgroup: Installation</p> <p>Task Group: <u>M. Washington (PM), P. Bourgeois, T. Creacy, and K. Watson.</u></p> <p>Meeting Action: A TG was assigned in the July 2015 meeting of M. Washington (PM), P. Bourgeois, T. Creacy, and K. Watson. P. Bourgeois and K. Watson should be removed. M. Wadkinson stated in an email "footnote 2 in 2.5.4 and footnote 5 in 3.5.3.3 have been incorporated in the new version of NB10-1201". Discussion was held and direction clarification was presented. A proposal was reviewed and revised. There was a motion to approve this proposal. The motion was unanimously approved.</p>		

8. New Business

Item Number: NB15-2104	NBIC Location: Part 1, S3.6 d)	No Attachment
General Description: General technical review of CO2 supplement in NBIC Part 1		
Subgroup: Installation		
Task Group: G. Scribner (PM), <u>M. Richards, T. Creacy, J. Brockman, and D. Patten</u>		
Meeting Action: G. Scribner presented a brief summary of the scope of this Action Item. A TG was assigned of M. Richards, T. Creacy, J. Brockman, and D. Patten to work with G. Scribner in reviewing the Fire Code technical document.		
Item Number: NB15-2209	NBIC Location: Part 1	No Attachment
General Description: Develop guidance and requirements for installation of graphite pressure equipment.		
Subgroup: Graphite		
Task Group: A. Stupica (PM)		
Meeting Action: Nothing received to report.		
Item Number: NB15-3001	NBIC Location: Part 1, 2.5.3.2	Attachment Page 31
General Description: Remove redundancy in 2.5.3.2 a) and d)		
Subgroup: Installation		
Task Group: None assigned		
Meeting Action: The SG reviewed the submitted suggestion from B. Besserman of NB and are in agreement accordingly. The group drafted a proposal. The proposal was reviewed and a motion was made to approve the proposal. The motion was unanimously approved.		
Item Number: NB15-3101	NBIC Location: Part 1	Attachment Page 32
General Description: Add “and documented” to the end of the sentence that reads “Detailed engineering evaluation of the pump selection shall be performed.		
Subgroup: Installation		
Task Group: None assigned		
Meeting Action: This is in 2.5.1.3 of which was a MC passed Action Item NB15-0401. The SG reviewed the submitted suggestion from J. Hoh of the NB and are in agreement accordingly. The group went on to draft a proposal. The proposal was reviewed and a motion was made to approve the proposal. The motion was unanimously approved.		

Item Number: NB15-3301	NBIC Location: Part 1	No Attachment
<p>General Description: Power boiler combustion air.</p> <p>Subgroup: Installation</p> <p>Task Group: <u>M. Wadkinson (PM), G. Halley, J. Brockman, T. Creacy, and D. Patten</u></p> <p>Meeting Action: A power point presentation was presented to the group by Joel Amato followed by group discussion. A TG was assigned of M. Wadkinson (PM), G. Halley, J. Brockman, T. Creacy, and D. Patten. TBD -Should this be addressed as General or as a Supplement?</p>		

The SC has requested the following New Action Items to address the following:

- NB16-0101-Carbon Monoxide Detectors/Alarms for Mechanical Rooms.
- NB16-0102-Pressure and System Testing.

9. Future Meetings

July 18-21, 2016 – Columbus, OH
January 9-12, 2017 – San Diego, CA

10. Future Meetings

The meeting was adjourned at 11:16 am

Respectfully submitted,



Jeanne Bock
NBIC Part 1 – Installation Secretary

SC Installation Attendance Sheet - 1/13/16

Name	Company	Phone Number	Email	Signature	Attend Rec.?	Guest?
Mike Richards	Southern Company	(205) 992-7111	hmichaelrichards.pe@gmail.com		Y	
Don Patten	Bay City Boiler	(510) 786-3711	dpatten@baycityboiler.com			
Jeanne Bock	National Board	(614) 431-3233	jbock@nationalboard.org		Y	1
Paul Bourgeois	Arise	(732) 943-6078	paul.bourgeois@arise.inc			
Geoffrey Halley	ABMA	(636) 394-3483	ghalleyjii@aol.com		Y	1
Stanley Konopacki	NRG Energy	(630) 771-7956 815 372-4740	stanley.konopacki@nrgenergy.com Stanley.Konopacki@NRG.COM		Y	-
Brian Moore	Hartford Steam Boiler	(860) 722-5657	brian.moore@hsb.com			
Paul Schuelke	Weil-McLain	(219) 879-6561	pschuelke@weil-mclain.com		+	
Melissa Wadkinson	Fulton Thermal	(315) 298-7112	melissa.wadkinson@fulton.com			
Edward Wiggins	Liberty Mutual	(256) 357-2825	edward.wiggins@libertymutual.com		Y	
Rickey Bryan	State of Texas	682-888 4806	rickey.bryan @ tdlr.texas.gov			✓
Keith Sanford	State of Texas	832-453 3017	Keith.Sanford@ Tdlr.Texas.gov		Y	
RANDALL AUSTIN	STATE OF ARIZONA	602-542- 1648	RANDY.AUSTIN@ AZDOSSH.GOV		X	0
GARY SCRIBNER	NBBI				-	
Joe Brockman	State of Missouri	573- 751-8708	Joe.Brockman @ dfs.dps.mo.gov		Y	-
Todd Creacy	Zurich	817-403 4601	todd.creacy@zurichna.com		Y	
Rob Trend	Texas	512 636-2727	Rob.Trend@TDLR. TEXAS.GOV		Y	

Interpretation IN15-0801

Proposed Interpretation

Inquiry:	IN15-0801
Source:	Sean Dust
Subject:	Part 1, 3.3.4
Edition:	2015
Question 1:	Question 1: Can the proposed boilers be installed with 1 inch of side clearance between each boiler, per the manufacturers installation recommendations?
Reply 1:	Yes. The proposed boilers can be installed with 1 inch of side clearance between each boiler, per the manufacturers installation recommendations.
Committee's Question:	Question 1: Is it permissible to install boilers less than the minimum 36" clearance if recommended by the manufacturer and approved by the Jurisdiction?
Committee's Reply:	Proposed Reply 1: Yes
Rationale:	In accordance with Part 1 Section 3.3.4 a)
SC Vote	unanimous
NBIC Vote	

Requesting Code Interpretation.

Inquiry:

Can the proposed boilers be installed with 1 inch of side clearance between each boiler, per the manufacturers installation recommendations?

Reply:

Yes. The proposed boilers can be installed with 1 inch of side clearance between each boiler, per the manufacturers installation recommendations.

Background Information:

We need to install five natural gas fired hot water boilers, where each boiler is rated at 6,000,000 btu/hr. The manufacturer has recommended these boilers be installed as a modular system, with 1 inch of clearance between the sides of each boiler, that is fully assembled at the factory, on a skid, complete with header. The manufacturer has provided documentation (a UL listing certificate) which indicates the 1 inch of side clearance between the boilers is acceptable, safe, as all operation, maintenance and inspection is accessible from the front, top and back of the boilers. Initial review by boiler inspectors has provided mixed results. Several inspectors indicate that the installation is acceptable with the 1 inch of clearance between the sides of the boilers, because operation, maintenance and inspection is accessible from the front, top, and back of the boilers. However one of the inspectors indicates that regardless of the manufacturers recommendations, history of installations, and UL certificate, it is not acceptable, and 36 inches of clearance must be provided on all sides of the boilers. The clearances come from PART1 section 3.3.4 of the code. Section 3.3.4 a) says 36 inches between all sides. But it also states alternative clearances in accordance with the manufacturer's recommendations, subject to acceptance by jurisdiction of course. The manufacturer has provided all documentation which indicates it is acceptable along with a history of similar installations. However, as mentioned, some feel it is acceptable, and some do not. Requesting a final ruling from the committee to resolve dispute.

Sincerely,

Sean Dust
Mechanical Engineer
Engineering Plans and Services
Corpus Christi Army Depot
308 Crecy Street
Corpus Christi, TX 78419
Phone: (361) 961-7058
E-mail: sean.c.dust.civ@mail.mil

d) Lugs or Hangers

Lugs, hangers, or brackets made of materials in accordance with the requirements of the code of construction may be attached by fusion welding provided they are attached by fillet welds along the entire periphery or contact edges. NBIC Part 1, Figure 3.3.1.1-b illustrates an acceptable design of hanger bracket with the additional requirement that the center pin be located at the vertical center line over the center of the welded contact surface. The bracket plates shall be spaced at least 2-1/2 in. (64 mm) apart, but this dimension shall be increased if necessary to permit access for the welding operation. The stresses computed by dividing the total load on each lug, hanger, or bracket, by the minimum cross-sectional area of the weld shall not exceed 2,800 psig (19 MPa). Where it is impractical to attach lugs, hangers, or brackets by welding, studs with not less than 10 threads/in. (approximately 4 threads/cm) may be used. In computing the shearing stresses, the root area at the bottom of the thread shall be used. The shearing and crushing stresses on studs shall not exceed that permitted by the code of construction.

3.3.2 SETTINGS

Steam heating, hot-water heating, and hot-water supply boilers of wrought materials of the wet-bottom type having an external width of over 36 in. (914 mm) shall be supported so as to have a minimum clearance of 12 in. (305 mm) between the bottom of the boiler and the floor to facilitate inspection. When the width is 36 in. (914 mm) or less, the clearance between the bottom of the boiler and the floor line shall be not less than 6 in. (150 mm), except when any part of the wet bottom is not farther from the outer edge than 12 in. (305 mm), this clearance shall be not less than 4 in. (100 mm). Boiler insulation, saddles, or other supports shall be arranged so that inspection openings are readily accessible.

3.3.3 STRUCTURAL STEEL

- a) If the boiler is supported by structural steel work, the steel supporting members shall be so located or insulated that the heat from the furnace will not affect their strength.
- b) Structural steel shall be installed in accordance with jurisdictional requirements, manufacturer's recommendations, and/or industry standards as appropriate.

3.3.4 CLEARANCES

- a) Heating boilers shall have a minimum distance of at least 36 in. (914 mm) between the top of the heating boiler and any overhead structure and at least 36 in. (914 mm) between all sides of the heating boiler and adjacent walls, structures, or other equipment. Heating boilers having manholes shall have at least 84 in. (2,135 mm) of clearance between the manhole opening and any wall, ceiling, piping, or other equipment that may prevent a person from entering the heating boiler. Alternative clearances in accordance with the manufacturer's recommendations are subject to acceptance by the Jurisdiction.
- b) Modular heating boilers that require individual units to be set side by side, front to back, or by stacking shall provide clearances in accordance with the manufacturer's recommendations, subject to acceptance by the Jurisdiction.
- c) Heating boilers shall be located so that adequate space is provided for proper operation, maintenance,⁴ and inspection of equipment and appurtenances.

⁴ Maintenance – This includes the removal of tubes.

NB10-1201

1.6 GENERAL REQUIREMENTS

The following are general requirements for the boilers, heaters and pressure vessels covered in NBIC Part1, Section 2, NBIC Part 1 Section 3, NBIC Part 1 Section 4, and NBIC Part 1 Supplement S5. Refer to each referenced section for additional requirements specific to the type of equipment covered by each section.

1.6.1 SUPPORTS, FOUNDATIONS, AND SETTINGS

Each boiler, heater, vessel and its associated piping must be safely supported. Design of supports, foundations, and settings shall consider vibration (including seismic where necessary), movement (including thermal expansion and contraction), and loadings (including the weight of the fluid in the system during a pressure test) in accordance with jurisdictional requirement, manufactures recommendations, and/or other industry standards, as applicable.

1.6.2 STRUCTURAL STEEL

- a) If the boiler, heater, vessel is supported by structural steel work, the steel supporting members shall be so located or insulated that the heat from the furnace will not affect their strength.
- b) Structural steel shall be installed in accordance with jurisdictional requirements, manufacturer's recommendations, and/or other industry standards, as applicable.

1.6.3 EXIT

Two means of exit shall be provided for equipment rooms exceeding 500 sq. ft. (46.5 sq. m) of floor area and containing one or more boilers having a combined fuel capacity of 1,000,000 Btu/hr (293 kW) or more (or equivalent electrical heat input). Each elevation shall be provided with at least two means of exit, each to be remotely located from each other. A platform at top of a single boiler, heater, vessel is not considered an elevation.

1.6.4 LADDERS AND RUNWAYS

- a) All walkways, runways, and platforms shall be:
 - 1) of metal construction or equivalent material;
 - 2) provided between or over the top of boilers, heaters, vessels that are more than 8 ft. (2.4 m) above the operating floor to afford accessibility for normal operation, maintenance, and inspection;
 - 3) constructed of safety treads, standard grating, or similar material and have a minimum width of 30 in. (760 mm);
 - 4) of bolted, welded, or riveted construction; and
 - 5) equipped with handrails 42 in. (1,070 mm) high with an intermediate rail and 4 in. (100 mm) toe board.
- b) Stairways that serve as a means of access to walkways, runways, or platforms shall not exceed an angle of 45 degrees from the horizontal and be equipped with handrails 42 in. (1,070 mm) high with an intermediate rail.

- c) Ladders that serve as a means of access to walkways, runways, or platforms shall:
- 1) be of metal construction and not less than 18 in. (460 mm) wide;
 - 2) have rungs that extend through the side members and are permanently secured;
 - 3) have a clearance of not less than 30 in. (760 mm) from the front of rungs to the nearest permanent object on the climbing side of the ladder;
 - 4) have a clearance of not less than 6-1/2 in. (165 mm) from the back of rungs to the nearest permanent object; and
 - 5) have a clearance width of at least 15 in. (380 mm) from the center of the ladder on either side across the front of the ladder.
- d) There shall be at least two permanently installed means of exit from walkways, runways, or platforms that exceed 6 ft. (1.8 m) in length.

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.

1.6.6 VENTILATION AND COMBUSTION AIR

- a) The equipment room shall have an adequate air to permit clean, safe combustion, minimize soot formation, and maintain a minimum of 19.5% oxygen in the air of the equipment room and sufficient to maintain ambient temperatures as recommended by the boiler, heater, vessel manufacturer. The combustion and ventilation air should be supplied by either an unobstructed air opening or by power ventilation or fans.
- b) When combustion air is supplied to the boiler, heater, vessel by an independent duct, with or without the employment of power ventilators or fans, the duct shall be sized and installed in accordance with the manufacturer's recommendations. However, ventilation for the equipment room must still be considered.
- c) Unobstructed air openings shall be sized on the basis of 1 sq. in. (650 sq. mm) free area per 2000 Btu/hr (586 W) maximum fuel input of the combined burners located in the equipment room or as specified by the National Fire Protection Association (NFPA) standards for oil and gas burning installations for the particular job conditions. The equipment room supply openings shall be kept clear at all times.
- d) Power ventilators or fans shall be sized on the basis of 0.2 cfm (0.0057 cu meters per minute) for each 1000 Btu/hr (293W) of maximum fuel input for the combined burners of all boilers and heaters located in the equipment room. Additional capacity may be required for other fuel burning equipment in the equipment room.
- e) When power ventilators or fans are used to supply combustion air, they shall be installed with interlock devices so that burners will not operate without an adequate number of ventilators/fans in operation.
- f) The size of openings specified in c) above may be reduced when special engineered air supply systems approved by the Jurisdiction are used.

- g) Care should be taken to ensure that steam, water and fluid lines are not routed across combustion air openings, where freezing may occur in cold climates.

1.6.7 LIGHTING

The equipment room should be well lighted and it should have an emergency light source for use in case of power failure.

1.6.8 CHIMNEY OR STACK

Chimneys or stacks shall be installed in accordance with jurisdictional and environmental requirements, manufacturer's recommendations, and/or industry standards, as applicable.

1.6.9 FINAL ACCEPTANCE

Boilers, heaters, or pressure vessels may not be placed into service until its installation has been inspected and accepted by the appropriate jurisdictional authorities

PART 1, SECTION 2 POWER BOILERS

2.3.1 SUPPORTS, FOUNDATIONS, AND SETTINGS

~~Each boiler and its associated piping must be safely supported. Design of supports, foundations, and settings shall consider vibration (including seismic where necessary), movement (including thermal movement), and loadings (including the weight of water during a hydrostatic test) in accordance with jurisdictional requirements, manufacturer's recommendations, and/or other industry standards, as applicable.~~

~~See NBIC Part 1, Section 1.6.1, *Supports, Foundations and Settings*~~

2.3.2 STRUCTURAL STEEL

- ~~a) If the boiler is supported by structural steel work, the steel supporting members shall be so located or insulated that the heat from the furnace will not affect their strength.~~
- ~~b) Structural steel shall be installed in accordance with jurisdictional requirements, manufacturer's recommendations, and/or other industry standards, as applicable.~~

~~See NBIC Part 1, Section 1.6.2, *Structural Steel*~~

2.4.1 EXIT

~~Two means of exit shall be provided for equipment rooms exceeding 500 sq. ft. (46.5 sq. m) floor area and containing one or more boilers having a combined fuel capacity of 1,000,000 Btu/hr (293 kW) or more. Each elevation shall be provided with at least two means of exit, each to be remotely located from the other. A platform at the top of a single boiler is not considered an elevation.~~

~~See NBIC Part 1, Section 1.6.3, *Exit*~~

2.4.2 LADDERS AND RUNWAYS

- ~~a) All walkways, runways, and platforms shall be:

 - ~~1) of metal construction;~~
 - ~~2) provided between or over the top of boilers that are more than 8 ft. (2.4 m) above the operating floor to afford accessibility for normal operation, maintenance, and inspection;~~
 - ~~3) constructed of safety treads, standard grating, or similar material and have a minimum width of 30 in. (760 mm);~~
 - ~~4) of bolted, welded, or riveted construction; and~~
 - ~~5) equipped with handrails 42 in. (1,070 mm) high with an intermediate rail and 4 in. (100 mm) toe board.~~~~
- ~~b) Stairways that serve as a means of access to walkways, runways, or platforms shall not exceed an angle of 45 degrees from the horizontal and shall be equipped with handrails 42 in. (1070 mm) high with an intermediate rail.~~
- ~~c) Ladders that serve as a means of access to walkways, runways, or platforms shall:~~

- ~~1) be of metal construction and not less than 18 in. (460 mm) wide;~~
 - ~~2) have rungs that extend through the side members and are permanently secured;~~
 - ~~3) have a clearance of not less than 30 in. (760 mm) from the front of rungs to the nearest permanent object on the climbing side of the ladder;~~
 - ~~4) have a clearance of not less than 6-1/2 in. (165 mm) from the back of rungs to the nearest permanent object; and~~
 - ~~5) have a clearance width of at least 15 in. (380 mm) from the center of the ladder on either side across the front of the ladder.~~
- ~~d) There shall be at least two permanently installed means of exit from walkways, runways, or platforms that exceed 6 ft. (1.8 m) in length.~~

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

2.5.2 FUEL

~~Fuel systems, whether firing coal, oil, gas, or other substance, shall be installed in accordance with jurisdictional and environmental requirements, manufacturer's recommendations, and/or industry standards, as applicable.~~

See NBIC Part 1, Section 1.6.5, *Fuel*

2.5.4 VENTILATION AND COMBUSTION AIR

- ~~a) The equipment room shall have an adequate air supply to permit clean, safe combustion, minimize soot formation, and maintain a minimum of 19.5% oxygen in the air of the boiler room. The combustion and ventilation air should be supplied by either an unobstructed air opening or by power ventilation or fans.²~~
- ~~b) Unobstructed air openings shall be sized on the basis of 1 sq. in. (650 sq. mm) free area per 2,000 Btu/hr (586 W) maximum fuel input of the combined burners located in the equipment room, or as specified in the National Fire Protection Association (NFPA) standards for oil and gas burning installations for the particular job conditions. The equipment room air supply openings shall be kept clear at all times.~~
- ~~c) Power ventilators or fans shall be sized on the basis of 0.2 cfm (0.0057 cu meters per minute) for each 1,000 Btu/hr (293 W) of maximum fuel input for the combined burners of all boilers located in the equipment room. Additional capacity may be required for any other fuel-burning equipment in the boiler room.~~
- ~~d) When power ventilators or fans are used to supply combustion air, they shall be installed with interlock devices so that the burners will not operate without an adequate number of ventilators/fans in operation.~~
- ~~e) The size of openings specified in NBIC Part 1, 2.5.4 b) may be reduced when special engineered air supply systems approved by the Jurisdiction are used.~~
- ~~f) Care should be taken to ensure that steam and water lines are not routed across combustion air openings, where freezing may occur in cold climates.~~

See NBIC Part 1, Section 1.6.6, *Ventilation and Combustion Air*

2.5.5 LIGHTING

~~The equipment room should be well lit and it should have an emergency light source for use in case of power failure.~~

~~See NBIC Part 1, Section 1.6.7, *Lighting*~~

2.6.1 CHIMNEY OR STACK

~~Chimneys or stacks shall be installed in accordance with jurisdictional and environmental requirements, manufacturer's recommendations, and/or industry standards, as applicable.~~

~~See NBIC Part 1, Section 1.6.8, *Chimney or Stack*~~

2.6.3.1 CONNECTION

~~2—Fans—When combustion air is supplied to the boiler by an independent duct, with or without the employment of power ventilators or fans, the duct shall be sized and installed in accordance with the manufacturer's recommendations. However, ventilation for the equipment room must still be considered.~~

2.10.5 FINAL ACCEPTANCE

~~A boiler may not be placed into service until its installation has been inspected and accepted by the appropriate jurisdictional authorities.~~

~~See NBIC Part 1, Section 1.6.9, *Final Acceptance*~~

PART 1, SECTION 3

INSTALLATION — STEAM HEATING BOILERS, HOT-WATER HEATING BOILERS, HOT-WATER SUPPLY BOILERS, AND POTABLE WATER HEATERS

3.3.1 SUPPORTS

~~Each heating boiler shall be supported by masonry and/or structural supports of sufficient strength and rigidity to safely support the heating boiler and its contents without vibration in the heating boiler or its connecting piping and to allow for expansion and contraction.~~

~~See NBIC Part 1, Section 1.6.1, *Supports, Foundations and Settings*~~

3.3.2 SETTINGS

~~Steam heating, hot water heating, and hot water supply boilers of wrought materials of the wet-bottom type having an external width of over 36 in. (914 mm) shall be supported so as to have a minimum clearance of 12 in. (305 mm) between the bottom of the boiler and the floor to facilitate inspection. When the width is 36 in. (914 mm) or less, the clearance between the bottom of the boiler and the floor line shall be not less than 6 in. (150 mm), except when any part of the wet bottom is not farther from the outer edge than 12 in. (305 mm), this clearance shall be not less than 4 in. (100 mm). Boiler insulation, saddles, or other supports shall be arranged so that inspection openings are readily accessible.~~

~~See NBIC Part 1, Section 1.6.1, *Supports, Foundations and Settings*~~

3.3.3 STRUCTURAL STEEL

- ~~a) If the boiler is supported by structural steel work, the steel supporting members shall be so located or insulated that the heat from the furnace will not affect their strength.~~
- ~~b) Structural steel shall be installed in accordance with jurisdictional requirements, manufacturer's recommendations, and/or industry standards as appropriate.~~

~~See NBIC Part 1, Section 1.6.2, *Structural Steel*~~

3.4.1 EXIT

~~Two means of exit shall be provided for equipment rooms exceeding 500 sq. ft. (46.5 sq. m) of floor area and containing one or more boilers having a combined fuel capacity of 1,000,000 Btu/hr (293 kW) or more (or equivalent electrical heat input). Each elevation shall be provided with at least two means of exit, each to be remotely located from the other. A platform at the top of a single boiler is not considered an elevation.~~

~~See NBIC Part 1, Section 1.6.3, *Exit*~~

3.4.2 LADDERS AND RUNWAYS

- ~~a) All walkways, runways, and platforms shall be:

 - ~~1) of metal construction;~~
 - ~~2) provided between or over the top of boilers that are more than 8 ft. (2.4 m) above the operating floor to afford accessibility for normal operation, maintenance, and inspection;~~~~

- ~~3) constructed of safety treads, standard grating, or similar material and have a minimum width of 30 in. (760 mm);~~
- ~~4) of bolted, welded, or riveted construction; and~~
- ~~5) equipped with handrails 42 in. (1,070 mm) high with an intermediate rail and 4 in. (100 mm) toe board.~~
- ~~b) Stairways that serve as a means of access to walkways, runways, or platforms shall not exceed an angle of 45 degrees from the horizontal and be equipped with handrails 42 in. (1,070 mm) high with an intermediate rail.~~
- ~~c) Ladders that serve as a means of access to walkways, runways, or platforms shall:

 - ~~1) be of metal construction and not less than 18 in. (460 mm) wide;~~
 - ~~2) have rungs that extend through the side members and are permanently secured;~~
 - ~~3) have a clearance of not less than 30 in. (760 mm) from the front of rungs to the nearest permanent object on the climbing side of the ladder;~~
 - ~~4) have a clearance of not less than 6-1/2 in. (165 mm) from the back of rungs to the nearest permanent object; and~~
 - ~~5) have a clearance width of at least 15 in. (380 mm) from the center of the ladder on either side across the front of the ladder.~~~~
- ~~d) There shall be at least two permanently installed means of exit from walkways, runways, or platforms that exceed 6 ft. (1.8 m) in length.~~

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

3.5.2 FUEL

~~Fuel systems, whether firing coal, oil, gas, or other substance, shall be installed in accordance with jurisdictional and environmental requirements, manufacturer's recommendations, and/or industry standards, as applicable.~~

See NBIC Part 1, Section 1.6.5, *Fuel*

3.5.4 VENTILATION AND COMBUSTION AIR

- ~~a) The equipment room shall have an adequate air supply to permit clean, safe combustion, minimize soot formation, and maintain a minimum of 19.5% oxygen in the air of the equipment room. The combustion and ventilation air may be supplied by either an unobstructed air opening or by power ventilation or fans.⁵~~
- ~~b) Unobstructed air openings shall be sized on the basis of 1 sq. in. (645 sq mm) free area per 2,000 Btu/hr (586 W) maximum fuel input of the combined burners located in the equipment room, or as specified in the National Fire Protection Association (NFPA) standards for oil and gas burning installations for the particular job conditions. The equipment room air supply openings shall be kept clear at all times.~~
- ~~c) Power ventilators or fans shall be sized on the basis of 0.2 ft³ (0.006 m³) for each 1,000 Btu/hr (293 W) of maximum fuel input for the combined burners of all boilers and/or water heaters located in the equipment room. Additional capacity may be required for any other fuel burning equipment in the equipment room.~~

- ~~d) When power ventilators or fans are used to supply combustion air, they shall be installed with interlock devices so that the burners will not operate without an adequate number of ventilators/fans in operation.~~
- ~~e) When combustion air is supplied to the heating boiler by an independent duct, with or without the employment of power ventilators or fans, the duct shall be sized and installed in accordance with the manufacturer's recommendations. However, ventilation for the equipment room must still be considered.~~
- ~~f) The size of openings specified in NBIC Part 1, 3.5.4 b) may be reduced when special engineered air supply systems approved by the Jurisdiction are used.~~
- ~~g) Care should be taken to ensure that steam and water lines are not routed across combustion air openings, where freezing may occur in cold climates.~~

See NBIC Part 1, Section 1.6.6, *Ventilation and Combustion Air*

3.5.5 LIGHTING

~~The boiler room should be well lit, and it should have an emergency light source for use in case of power failure.~~

See NBIC Part 1, Section 1.6.7, *Lighting*

3.6.1 CHIMNEY OR STACK

~~Chimneys or stacks shall be installed in accordance with jurisdictional and environmental requirements, manufacturer's recommendations, and/or industry standards, as applicable.~~

See NBIC Part 1, Section 1.6.8, *Chimney or Stack*

3.10.2 FINAL ACCEPTANCE

- ~~a) In addition to determining that all equipment called for is furnished and installed in accordance with the plans and specifications, all controls shall be tested by a person familiar with the control system.~~
- ~~b) Before any new heating plant (or boiler) is accepted for operation, a final (or acceptance) inspection by a person familiar with the system shall be completed and all items of exception corrected.~~

See NBIC Part 1, Section 1.6.9, *Final Acceptance*

PART 1, SECTION 4 INSTALLATION — PRESSURE VESSELS

4.3.1 SUPPORTS

~~Each pressure vessel shall be safely supported. The potential for future hydrostatic pressure tests of the vessel after installation shall be considered when designing vessel supports. Design of supports, foundations, and settings shall consider vibration (including seismic and wind loads where necessary), movement (including thermal movement), and loadings (including the weight of water during a hydrostatic test) in accordance with jurisdictional requirements, manufacturer's recommendations, and/or other industry standards, as applicable.~~

~~See NBIC Part 1, Section 1.6.1, *Supports, Foundations and Settings*~~

SUPPLEMENT 5

INSTALLATION OF THERMAL FLUID HEATERS

S5.3.1 SUPPORTS, FOUNDATIONS, AND SETTINGS

~~Each thermal fluid heater and its associated piping must be safely supported. Design of supports, foundations, and settings shall consider vibration (including seismic where necessary), movement (including thermal movement), and loadings (including the weight of the fluid in the system) in accordance with jurisdictional requirements, manufacturer's recommendations, and/or other industry standards, as applicable.~~

~~[See NBIC Part 1, Section 1.6.1 Supports, Foundations, and Settings](#)~~

S5.3.2 STRUCTURAL STEEL

- ~~a) If the thermal fluid heater is supported by structural steel work, the steel supporting members shall be so located or insulated that the heat from the furnace will not affect its strength.~~
- ~~b) Structural steel shall be installed in accordance with jurisdictional requirements, manufacturer's recommendations, and/or other industry standards, as applicable.~~

~~[See NBIC Part 1, Section 1.6.2 Structural Steel](#)~~

S5.4.1 EXIT

~~Two means of exit shall be provided for thermal fluid heater rooms exceeding 500 sq. ft. (46.5 sq. m) floor area and containing one or more thermal fluid heaters having a combined fuel capacity of 1,000,000 Btu/hr (293 kW) or more. Each elevation shall be provided with at least two means of exit, each to be remotely located from the other. A platform at the top of a single thermal fluid heater is not considered an elevation.~~

~~[See NBIC Part 1, Section 1.6.3 Exit](#)~~

S5.4.2 LADDERS AND RUNWAYS

- ~~a) All walkways, runways and platforms shall be:

 - ~~1) Of metal construction;~~
 - ~~2) Provided between or over the top of heaters that are more than 8 ft. (2.4 m) above the operating floor to afford accessibility for normal operation, maintenance, and inspection;~~
 - ~~3) Constructed of safety treads, standard grating, or similar material and have a minimum width of 30 in. (760 mm);~~
 - ~~4) Of bolted, welded, or riveted construction; and~~
 - ~~5) Equipped with handrails 42 in. (1,070 mm) high with an intermediate rail and 4 in. (100 mm) toe-board.~~~~
- ~~b) Stairways that serve as a means of access to walkways, runways, or platforms shall not exceed an angle of 45 degrees from the horizontal and be equipped with handrails 42 in. (1,070 mm) high with an intermediate rail.~~
- ~~c) Ladders that serve as a means of access to walkways, runways, or platforms shall:~~

- 1) ~~Be of metal construction and not less than 18 in. (460 mm) wide;~~
 - 2) ~~Have rungs that extend through the side members and are permanently secured;~~
 - 3) ~~Have a clearance of not less than 30 in. (760 mm) from the front of rungs to the nearest permanent object on the climbing side of the ladder;~~
 - 4) ~~Have a clearance of not less than 6½ in. (165 mm) from the back of rungs to the nearest permanent object; and~~
 - 5) ~~Have a clearance width of at least 15 in. (380 mm) from the center of the ladder on either side across the front of the ladder.~~
- d) ~~There shall be at least two permanently installed means of exit from walkways, runways, or platforms that exceed 6 ft. (1.8m) in length.~~

See NBIC Part 1, Section 1.6.4 Ladders and Runways

S5.5.6 FUEL

~~Fuel systems, whether firing on oil, gas, or other substances, shall be installed in accordance with jurisdictional and environmental requirements, manufacturer's recommendations, and/or other industry standards, as applicable.~~

See NBIC Part 1, Section 1.6.5 Fuel

S5.5.8 VENTILATION AND COMBUSTION AIR

- a) ~~The equipment room shall have an adequate air supply to permit clean, safe combustion, minimize soot formation, and maintain a minimum of 19.5% oxygen in the air of the equipment room and sufficient to maintain ambient temperatures as recommended by the heater manufacturer. The combustion and ventilation air should be supplied by either an unobstructed air opening or by power ventilation or fans.~~

Note: ~~When combustion air is supplied to the thermal fluid heater by an independent duct, with or without the employment of power ventilators or fans, the duct shall be sized and installed in accordance with the manufacturer's recommendations. However, ventilation for the equipment room must still be considered.~~

- b) ~~Unobstructed air openings shall be sized on the basis of 1 sq. in. (650 sq. mm) free area per 2,000 Btu/ hr (586 W) maximum fuel input of the combined burners located in the equipment room, or as specified in the National Fire Protection Association (NFPA) standards for oil and gas burning installations for the particular job conditions. The heater equipment room air supply openings shall be kept clear at all times.~~
- c) ~~Power ventilators or fans shall be sized on the basis of 0.2 cfm (0.0057 cu meters per minute) for each 1,000 Btu/hr (293 W) of maximum fuel input for the combined burners of all thermal fluid heaters located in the equipment room. Additional capacity may be required for any other fuel burning equipment in the equipment room. Pressure in the room should be consistently neutral.~~
- d) ~~When power ventilators or fans are used to supply combustion air they shall be installed with interlock devices so that the burners will not operate without an adequate number of ventilators/fans in operation.~~
- e) ~~The size of openings specified in b) may be reduced when special engineered air supply systems approved by the Jurisdiction are used.~~

~~f) Care should be taken to ensure that thermal fluid lines are not routed across combustion air openings, where freezing may occur in cold climates.~~

~~See NBIC Part 1, Section 1.6.6 Ventilation and Combustion Air~~

S5.5.9 LIGHTING

~~The equipment room should be well lit and it should have an emergency light source for use in case of power failure.~~

~~See NBIC Part 1, Section 1.6.7 Lighting~~

S5.6.1 CHIMNEY OR STACK

~~Chimneys or stacks shall be installed in accordance with jurisdictional and environmental requirements, manufacturer's recommendations, and/or industry standards, as applicable.~~

~~See NBIC Part 1, Section 1.6.8 Chimney or Stack~~

S5.8.5 FINAL ACCEPTANCE

~~A thermal fluid heater may not be placed into service until its installation has been inspected and accepted by the appropriate jurisdictional authorities.~~

~~See NBIC Part 1, Section 1.6.9, Final Acceptance~~

Action Item Request Form

8.3 CODE REVISIONS OR ADDITIONS

Request for Code revisions or additions shall provide the following:

a) Proposed Revisions or Additions

For revisions, identify the rules of the Code that require revision and submit a copy of the appropriate rules as they appear in the Code, marked up with the proposed revision. For additions, provide the recommended wording referenced to the existing Code rules.

Existing Text:

2.10.2 PRESSURE TEST

Prior to initial operation, the completed boiler, including pressure piping, water columns, superheaters, economizers, stop valves, etc., shall be pressure tested in accordance with the original code of construction. Any pressure piping and fittings such as water columns, blowoff valves, feedwater regulators, superheaters, economizers, stop valves, etc., which are shipped connected to the boiler as a unit, shall be hydrostatically tested with the boiler and witnessed by an Inspector.

2.10.4 SYSTEM TESTING

Prior to final acceptance, an operational test shall be performed on the complete installation. The test data shall be recorded and the data made available to the jurisdictional authorities as evidence that the installation complies with the provisions of the governing code(s) of construction. This operational test may be used as the final acceptance of the unit.

3.10.1 PRESSURE TEST

Prior to initial operation, the completed boiler, individual module, or assembled module, shall be subjected to a pressure test in accordance with the requirements of the original code of construction.

4.6 TESTING AND ACCEPTANCE

a) The installer shall exercise care during installation to prevent loose weld material, welding rods, small tools, and miscellaneous scrap metal from getting into the vessel. The installer shall inspect the interior of the vessel and its appurtenances where possible prior to making the final closures for the presence of foreign debris.

b) The completed pressure vessel shall be pressure tested in the shop or in the field in accordance with the original code of construction. When required by the Jurisdiction, owner or user, the Inspector shall witness the pressure test of the completed installation, including piping to the pressure gage, pressure relief device, and, if present, level control devices.

4.7.6 TESTING AND ACCEPTANCE

Testing and acceptance shall be in accordance with NBIC Part 1, 4.6

b) Statement of Need

Provide a brief explanation of the need for the revision or addition.

NB10-1201 Covered reformatting multiple items. Pressure Testing was inconsistent between the three sections and really needs to be addressed

c) Background Information

Provide background information to support the revision or addition, including any data or changes in technology that form the basis for the request that will allow the Committee to adequately evaluate the proposed revision or addition. Sketches, tables, figures, and graphs should be submitted as appropriate.

When applicable, identify any pertinent paragraph in the Code that would be affected by the revision or addition and identify paragraphs in the Code that reference the paragraphs that are to be revised or added.

N/A

Simmons, Kevin 10/16/2015 11:19:40 AM	Abstain pending response to questions raised by other committee members
Webb, Michael 10/16/2015 8:36:52 AM	I too would like to abstain until I see a response to the approve & disapprove comments posted.
Edwards, Paul 10/8/2015 12:31:00 PM	I will abstain pending resolution of the negatives and comments.
Staniszewski, Stanley 10/2/2015 8:40:15 AM	Agree with comments of Mr. Cook & Trout. Proposal should also consider using consistent terminology with Part 1. Is there a difference in Boiler manufacturer vs burner mfg as used in the proposal that warrants its use?
Mooney, Mark 10/1/2015 7:55:25 AM	I think Don Cook And Rob Troutt make valid comments.
Amato, Joel 9/29/2015 10:55:29 AM	I don't think we should carve out that the supplement only applies to Owner/User/Installer and that this should be struck from the proposal. The supplement applies to all users of the Code and this type of exception is not appropriate.
Amato, Joel 9/21/2015 11:34:37 AM	I believe the venting of flue gases should also include requirements for the location of the termination, this would include distances from doors and windows.
Troutt, Robby 9/21/2015 11:30:30 AM	I have several concerns with the proposed. -The Scope talks about CO detector/alarm, however the body has no requirements listed for these components. If we are going to address detector/alarm in the Scope, then there should be verbiage in the body for the requirement. -Because this is addressing Condensing Boilers (which gets Combustion Air from outside) and we do not address "Ventilation", I fear the requirements of Part 1, Paragraph 3.5.4 (Ventilation and Combustion Air) will not be adhered to. For this reason, I feel we should reinforce requirements of 3.5.4 for "Ventilation" purposes. Reasoning: Here in Texas we had the same ventilation requirements as NBIC up to June 15th of this year. When we saw Condensing Boilers being installed, we found the installers felt they did not need ventilation as the boiler pulls air for combustion from the outside. They stated, because the mechanical room was an interior room, Fire Codes required up to a 2 hour "Fire Wall" (depending on the building use, size of mech. room, etc.), they could not provide ventilation. They further stated, since the air for combustion was pulled from outside the building, it was not required. We made a revision to Texas Boiler Rules to require CO Detectors if ventilation was not installed and Condensing Boilers were installed. I am not stating we should make this the same as Texas did, instead I am concerned other Jurisdictions will see the same occurrences as we did. I just feel it should be addressed.

R. Troutt – comment was addressed in adding S6.4 e)

J. Amato – comment was addressed in S6.4 d) by adding National Fuel Gas Code (ANSI Z223.1)

D. Cook – comment was addressed in S6.1 b)

PART 1, SECTION 6**SPECIAL REQUIREMENTS FOR THE INSTALLATION OF CONDENSING BOILERS****S6.1** **SCOPE**

- a) NBIC Part 1 Section 6 Supplement 6 provides requirements for various aspects of the installation of Condensing Boilers which are unique from other products covered by this section.
- b) This supplement ~~is intended for the Owner/User/Installer only, and~~ is based on Local, State or National Building Codes requiring the installation of a Carbon Monoxide (CO) detector/alarm in the boiler room.

S6.2 **DETERMINATION OF ALLOWABLE OPERATING PARAMETERS**

The allowable operating parameters of the combustion air intake and the exhaust gas venting shall be in accordance with jurisdictional, environmental and manufacturers recommendations, as applicable.

S6.3 **GENERAL REQUIREMENTS**

Condensing boilers shall meet all the requirements of NBIC Part 1, Section 3 and this Supplement.

S6.4 **FLUE GAS VENTING SYSTEM PIPING REQUIREMENTS**

- a) The vent piping shall be corrosion resistant and fabricated from either stainless alloy or plastic material as defined by the boiler manufacturer and certified for the application.
- b) The diameter of the vent piping shall be as defined by the boiler manufacturer and shall not be reduced, except as allowed by the boiler manufacturer.
- c) The “Total Equivalent Length” of the vent piping, and the pressure drop through the vent piping, shall not exceed that stated in the Boiler Manufacturer’s Installation Manual. (Note Equivalent Length includes the pressure loss effect of various pipe fittings, such as elbows, etc.) Horizontal pipe runs shall slope toward the boiler and the condensate collection point.
- d) The termination point of the vent piping shall be positioned such that there is no possibility of vented flue gas being entrained in the combustion air intake, as defined by the manufacturer ~~and~~ National Fuel Gas Code (ANSI Z223.1). Additionally the vent termination shall be located above the highest known snowline for the location involved, and be designed in such a manner, so as to prevent freezing.

- e) This supplement requires the owner/user/installer contact the authority having Jurisdiction regarding the installation of carbon monoxide (CO) detector/alarm in boiler rooms in which condensing boilers are to be installed.

S6.5 **SEALED COMBUSTION SYSTEM REQUIREMENTS**

- a) The location of the outside air intake, relative to the flue gas vent, shall be such that there shall be no cross contamination with products of combustion or other airborne corrosive or hazardous contaminants, as defined by the manufacturer. Additionally the location of the combustion air intake shall be above the highest known snowline for the location involved.
- b) The diameter, length and routing of the combustion air intake piping shall be such that the pressure drop through the system, including any filters, shall not exceed the maximum pressure drop stated by the boiler/burner manufacturer.

S6.6 **CONDENSATE DRAIN SYSTEM REQUIREMENTS**

The flue gas condensate from an individual boiler shall be collected at a single point, and the routing of the drain piping shall include the following features:

- 1) A water trap, the height of which cannot be varied by field manipulation, and is in accordance with boiler manufacturers requirements.
- 2) A visible means of ensuring that the condensate water trap contains the correct water level.
- 3) A discharge point away from occupied areas.
- 4) A method of controlling the pH of the condensate prior to its discharge into a sewer system, if required by local building Codes.

NB15-0107

Proposed item for NBIC

ITEM NB15-0107**3.8.2.3 TEMPERATURE CONTROL**

Each automatically fired hot-water heating or hot-water supply boiler shall be protected from over-temperature by two temperature-operated controls.

a) Each individual hot-water heating or hot-water supply boiler or each system of commonly connected boilers shall have a control that will cut off the fuel supply when the water temperature reaches an operating limit, which shall be less than the maximum allowable temperature.

b) In addition to a) above, each individual automatically fired hot-water heating or hot-water supply boiler shall have a safety limit control with manual reset that will cut off the fuel supply ~~to prevent the water temperature from exceeding the~~ at or below maximum allowable temperature at the boiler outlet.

For information only:

Rational: BPV IV, CSD-1 and NBIC have similar language but not the same. This item has been opened to make the language between the 3 Codes consistent. The ASME BPV IV item is shown below and has been board approved. There is an open item in CSD-1 15-2057 that will go to ballot . A mark-up of the intended changes based on the 2012 Edition is shown for information only.

Item 11-223 board approved by ASME**HG-613 TEMPERATURE CONTROL**

Each automatically fired hot water heating or hot water supply boiler shall be protected from over-temperature by two temperature-operated controls. These temperature control devices shall conform to UL 353, Standard for Limit Controls, and shall be accepted by a nationally recognized testing agency.

(a) Each individual automatically fired hot water heating or hot water supply boiler shall have a high temperature limit control that will cut off the fuel supply ~~to prevent water temperature~~

from exceeding its at or below the marked maximum water temperature at the boiler outlet. This control shall be constructed to prevent a temperature setting above the maximum.

(b) Each individual hot water heating or hot water supply boiler shall have a control that will cut off the fuel supply when the system water temperature reaches a preset operating temperature, which shall be less than the maximum water temperature.

Proposed item for CSD-1

(12) CW-410 Requirements for Temperature Controls for Hot-Water Heating and Supply Boilers

(a) Each temperature control device shall conform to UL 353, Standard for Limit Controls, and shall be accepted by a nationally recognized testing agency.

(b) Each automatically fired hot-water boiler or each system of commonly connected hot-water boilers shall have at least one temperature-actuated control to shut off the fuel supply when the system water reaches a preset operating temperature. This requirement does not preclude the use of additional operating control devices where required.

(c) In addition to the temperature control required in CW-410(b), each individual automatically fired hot-water boiler unit shall have a high temperature limit control that will ~~prevent the water temperature from exceeding~~ cut off the fuel supply at or below the maximum allowable temperature. The upper set point limit or the maximum fixed stop limit of the selected control shall not exceed the maximum allowable temperature. Functioning of this control shall cause safety shutdown and lockout. The manual reset may be incorporated in the temperature limit control. Where a reset device is separate from the temperature limit control, a means shall be provided to indicate actuation of the temperature limit control. EXCEPTION: Lockout is not required for boiler units installed in residences, as defined by the authority having jurisdiction.

(d) Each limit and operating control shall have its own sensing element and operating switch, unless the boiler temperature and limit control functions are performed by a primary safety control system meeting all the requirements of CW-210(a).

(e) A temperature limit control of the automatic or manual reset type shall be

2.8.5 AUTOMATIC LOW-WATER FUEL CUTOFF AND/OR WATER FEEDING DEVICE FOR STEAM OR VAPOR SYSTEM BOILERS

- a) Each automatically fired steam-or vapor-system boiler shall have an automatic low-water fuel cutoff so located as to automatically cut off the fuel supply when the surface of the water falls to 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 1/2 (DN 15) between the boiler and 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) In addition to the requirements in a) and b) above, a secondary low-water fuel cutoff with manual reset shall be provided on each automatically fired steam or vapor system boiler.
- d) Fuel cutoffs and water feeding devices embodying a separate chamber shall have a vertical drain pipe, extended to a safe point of discharge, and a blowoff valve not less than NPS 3/4 (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.

Action Item Request Form

8.3 CODE REVISIONS OR ADDITIONS

Request for Code revisions or additions shall provide the following:

a) Proposed Revisions or Additions

For revisions, identify the rules of the Code that require revision and submit a copy of the appropriate rules as they appear in the Code, marked up with the proposed revision. For additions, provide the recommended wording referenced to the existing Code rules.

Existing Text:

There are 7 footnotes which occur throughout Part 1.

- 1 Caution, some Jurisdictions may independently administer a program of authorization for organizations to perform repairs and alterations within that Jurisdiction.
- 2 Fans – When combustion air is supplied to the boiler by an independent duct, with or without the employment of power ventilators or fans, the duct shall be sized and installed in accordance with the manufacturer’s recommendations. However, ventilation for the equipment room must still be considered.
- 3 (NB-27) can be found on the National Board web-site, www.nationalboard.org.
- 4 Maintenance – This includes the removal of tubes.
- 5 Fans – When combustion air is supplied to the boiler by an independent duct, with or without the employment of power ventilators or fans, the duct shall be sized and installed in accordance with the manufacturer’s recommendations. However, ventilation for the equipment room must still be considered.
- 6 Side — The top side of the boiler shall mean the highest practicable part of the boiler proper but in no case shall the safety valves be located below the normal operating level and in no case shall the safety relief valve be located below the lowest permissible water level.
- 7 Pressure roll load, line load, and nip load are terms that are used interchangeably to refer to the interaction between the pressure roll(s) and the Yankee dryer. It is called “nip” load because the pressure roll is rubber-covered and is pressed up against the Yankee with enough force to create a nip (or pinch) that forces the paper into line contact between the rolls and provides some mechanical dewatering. The paper then sticks onto the Yankee surface and follows the Yankee dryer for thermal dewatering by the steam-heated Yankee surface. This “nip load” is called a “line load” because the units are load (force) per length of line contact. The units are pounds per linear inch (PLI) and kilonewtons per meter (kN/m).

b) Statement of Need

Provide a brief explanation of the need for the revision or addition.

The desire is to avoid footnotes where possible in order to better manage changes and revisions within the context of the Part. It was determined that some footnotes could be easily placed within the paragraph and incorporated as part of the section. Where the footnotes can be blended back into the text, maintenance of the Part can be achieved in a more efficient manner. All but one of the footnotes were able to be merged into the paragraph. The one remaining footnote was better applied as a definition, therefore moved to this section.

c) Background Information

Provide background information to support the revision or addition, including any data or changes in technology that form the basis for the request that will allow the Committee to adequately evaluate the proposed revision or addition. Sketches, tables, figures, and graphs should be submitted as appropriate.

When applicable, identify any pertinent paragraph in the Code that would be affected by the revision or addition and identify paragraphs in the Code that reference the paragraphs that are to be revised or added.

See the attached document.

d) TG Assigned – SG Installation

Project Manager: Milton Washington

Members: Brian Moore, Paul Bourgeois, Ken Watson and Todd Creacy

Recommended Revisions for NB15-2303

Page 12 – Section 2

Original Text, Footnote 2. Fans – When combustion air is supplied to the boiler by an independent duct, with or without the employment of power ventilators or fans, the duct shall be sized and installed in accordance with the manufacturer's recommendations. However, ventilation for the equipment room must still be considered.

2.5.4 VENTILATION AND COMBUSTION AIR

- a) The equipment room shall have an adequate air supply to permit clean, safe combustion, minimize soot formation, and maintain a minimum of 19.5% oxygen in the air of the boiler room. The combustion and ventilation air should be supplied by either an unobstructed air opening or by power ventilation or fans.² ~~Fan—When combustion air is supplied to the boiler by an independent duct, with or without the employment of power ventilators or fans, the duct shall be sized and installed in accordance with the manufacturer's recommendations. However, ventilation for the equipment room must still be considered.~~
-

Page 15 – Section 2

Original Text, Footnote 3. *The Guide for Blowoff Vessels* (NB-27) can be found on the National Board web-site, www.nationalboard.org

2.7.5 BLOWOFF

- p) Boiler blowoff systems shall be constructed in accordance with the *Guide for Blowoff Vessels* (NB-27) ³ ~~The Guide for Blowoff Vessels (NB-27) which, can be found on the National Board web-site, www.nationalboard.org.~~
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Page 27 – Section 3

Original Text, Footnote 4. Maintenance – This includes the removal of tubes.

3.3.4 CLEARANCES

- c) Heating boilers shall be located so that adequate space is provided for proper operation, maintenance⁴ ~~Maintenance—This~~ and inspection of equipment and appurtenances which shall include the removal of tubes if applicable.
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Page 30 – Section 3

Original Text, Footnote 5. Fans – When combustion air is supplied to the boiler by an independent duct, with or without the employment of power ventilators or fans, the duct shall be sized and installed in accordance with the manufacturer’s recommendations. However, ventilation for the equipment room must still be considered.

3.5.4 VENTILATION AND COMBUSTION AIR

- a) The equipment room shall have an adequate air supply to permit clean, safe combustion, minimize soot formation, and maintain a minimum of 19.5% oxygen in the air of the equipment room. The combustion and ventilation air may be supplied by either an unobstructed air opening or by power ventilation or fans.⁵ ~~Fans~~ – When combustion air is supplied to the boiler by an independent duct, with or without the employment of power ventilators or fans, the duct shall be sized and installed in accordance with the manufacturer’s recommendations. However, ventilation for the equipment room must still be considered.

Page 47 – Section 3

Original Text, Footnote 6. Side — The top side of the boiler shall mean the highest practicable part of the boiler proper but in no case shall the safety valves be located below the normal operating level and in no case shall the safety relief valve be located below the lowest permissible water level.

3.9.1.1.1 PERMISSIBLE MOUNTING

Safety valves and safety relief valves shall be located at the top side⁶ of the boiler. ~~Side~~ - The top side of the boiler shall mean the highest practicable part of the boiler proper but in no case shall the safety valves be located below the normal operating level and in no case shall the safety relief valve be located below the lowest permissible water level. They shall be connected directly to a tapped or flanged opening in the boiler, to a fitting connected to the boiler by a short nipple, to a Y-base, or to a valveless header connecting steam or water outlets on the same boiler. Coil or header type boilers shall have the safety valve or safety relief valve located on the steam or hot-water outlet end. Safety valves and safety relief valves shall be installed with their spindles vertical. The opening or connection between the boiler and any safety valve or safety relief valve shall have at least the area of the valve inlet.

Page 66 – Supplement 1

Original Text, Footnote 7. Pressure roll load, line load, and nip load are terms that are used interchangeably to refer to the interaction between the pressure roll(s) and the Yankee dryer. It is called “nip” load because the pressure roll is rubber-covered and is pressed up against the Yankee with enough force to create a nip (or pinch) that forces the paper into line contact between the rolls and provides some mechanical dewatering. The paper then sticks onto the Yankee surface and follows the Yankee dryer for thermal dewatering by the steam-heated Yankee surface. This “nip load” is called a “line load” because the units are load (force) per length of line contact. The units are pounds per linear inch (PLI) and kilonewtons per meter (kN/m).

S1.2 ASSESSMENT OF INSTALLATION

- 4) Pressure roll load (line or nip load)^z due to pressing the wet web onto the dryer. Overload protection is usually provided by a control valve that limits the pneumatic or hydraulic forces on the roll loading arms such that the resultant nip load does not exceed the allowable operating nip load.

Amend this footnote to Part 1, Section 9, Installation – Glossary of Terms

9.1 DEFINITIONS

Pressure roll load – The terms line load, and nip load are ~~terms that are~~ used interchangeably to refer to the interaction between the pressure roll(s) and the Yankee dryer. It is called “nip” load because the pressure roll is rubber-covered and is pressed up against the Yankee with enough force to create a nip (or pinch) that forces the paper into line contact between the rolls and provides some mechanical dewatering. The paper then sticks onto the Yankee surface and follows the Yankee dryer for thermal dewatering by the steam-heated Yankee surface. This “nip load” is called a “line load” because the units are load (force) per length of line contact. The units are pounds per linear inch (PLI) and kilonewtons per meter (kN/m).

NB15-3001

These two paragraphs have redundant requirements.

2.5.3.2 REMOTE EMERGENCY SHUTDOWN SWITCHES

a) A manually operated remote shutdown switch or circuit breaker shall be located just outside the equipment room door and marked for easy identification. Consideration should also be given to the type and location of the switch in order to safeguard against tampering.

d) Consideration should be given to the type and location of the remote emergency shutdown switch(es) in order to safeguard against tampering. Where approved by the Jurisdiction, alternate locations of remote emergency switch(es) may be provided.

Proposed changes:**2.5.3.2 REMOTE EMERGENCY SHUTDOWN SWITCHES**

a) A manually operated remote shutdown ~~switch~~switch(es) or circuit breaker shall be located just outside the equipment room door and marked for easy identification. Consideration should also be given to the type and location of the ~~switch~~ switch(es) in order to safeguard against tampering. Where approved by the Jurisdiction, alternate locations of remote emergency switch(es) may be provided.

~~d) Consideration should be given to the type and location of the remote emergency shutdown switch(es) in order to safeguard against tampering. Where approved by the Jurisdiction, alternate locations of remote emergency switch(es) may be provided.~~

Note: This will require renumbering 2.5.3.2 e) to 2.5.3.2 d) and 2.5.3.2 f) to 2.5.3.2 e).

Proposal:**NB15-0401 approved July 2015****2.5.1.3 PUMPS**

- a) Boiler feedwater pumps shall have discharge pressure in excess of the ~~maximum allowable working pressure (MAWP)~~ highest set pressure relief valve in order to compensate for frictional losses, entrance losses, regulating valve losses, and normal static head, etc. Each source ~~of feedwater~~ shall be capable of supplying feedwater to the boiler at a minimum pressure of 3% higher than the highest setting of any ~~safety pressure relief valve~~ proper ~~plus the expected pressure drop across the boiler.~~ Detailed engineering evaluation of the pump selection shall be performed. The following table is a guideline for estimating feedwater pump differential:

NB15-3101 proposed January 2016**2.5.1.3 PUMPS**

- a) Boiler feedwater pumps shall have discharge pressure in excess of the highest set pressure relief valve in order to compensate for frictional losses, entrance losses, regulating valve losses, and normal static head, etc. Each source shall be capable of supplying feedwater to the boiler at a minimum pressure of 3% higher than the highest setting of any pressure relief valve on the boiler proper. Detailed engineering evaluation of the pump selection shall be performed and available. The following table is a guideline for estimating feedwater pump differential: