Date Distributed: December 19th, 2019

THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

NATIONAL BOARD SUBCOMMITTEE INSTALLATION

AGENDA

Meeting of January 15th, 2020
San Diego, CA

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

2. **Introduction of Members and Visitors**

3. **Check for a Quorum**

4. **Awards/Special Recognitions**

5. **Announcements**

   The National Board will be hosting a reception for all committee members and visitors on Wednesday evening at 5:30pm at The Smoking Gun. Additional information about the reception can be found on the Hotel Information webpage for the meeting: https://www.nationalboard.org/Index.aspx?pageID=456&ID=478

6. **Adoption of the Agenda**

7. **Approval of the Minutes of July 17th, 2019 Meeting**

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

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

   a. **Membership Nominations**

      - Mr. Patrick Jennings – AIA (Attachment Page 2)

   b. **Membership Reappointments**

      The following subcommittee member terms are set to expire before the July 2020 meeting:
      - Mr. Stanley Konopacki (Users)
      - Mr. Rex Smith (AIA)
      - Mr. Eddie Wiggins (AIA)
      - Mr. Don Patten (Manufacturers)

   c. **Officer Appointment**

      Mr. Don Patten's term as Vice Chair of the subcommittee is set to expire on 2/27/2020. This is the end of his second consecutive 3-year term as Vice Chair and he is therefore not eligible for reappointment as Vice Chair, unless no other member wishes to serve as Vice Chair.

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

   - NB15-0108B – Address pressure relief devices in new supplement on high temperature hot water boilers – A. Renaldo (PM)
   - NB15-0305 – Create Guidelines for Installation of Overpressure Protection by System Design – D. Marek (PM)
   - NB15-0308 – Create Guidelines for Installation of Pressure Relief Devices for Organic Fluid Vaporizers – T. Patel (PM)
   - NB15-0315 – Review isolation valve requirements in Part 1, 4.5.6 and 5.3.6 – D. DeMichael (PM)
   - NB16-0805 – Temperature ratings for discharge piping and fittings – A. Renaldo (PM)
   - 17-115 – Complete rewrite of Part 4, Section 2 combining common requirements into a general requirements section for all pressure relief devices – A. Renaldo (PM)
   - 17-119 – Part 4, 2.2.5 states that pressure setting may exceed 10% range. Clarify by how much – T. Patel (PM)
   - 17-128 – Fix contradiction between Part 4, 2.4.1.6 a) and 2.4.4.3 regarding Y bases. – B. Nutter (PM)
   - 18-73 – Update installation requirements for Thermal Fluid Heaters (Part 1, S5.7.6) – T. Patel (PM)
   - 19-49 – Ensure shipping plugs for PRDs are removed during the installation process

10. Action Items

Item Number: NB11-1901	NBIC Location: Part 1	Attachment Pages 5-12

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: R. Smith (PM), M. Richards, S. Konopacki, D. Patten and E. Wiggins

July Meeting Action: Proposal – R. Smith (PM) presented a summary and a cleaned up proposal. Discussions took place amongst the SC. There was a motion to approve the proposal to the MC for letter ballot. The motion was unanimously approved.

Update: This item was balloted to SC PRD at the request of the Main Committee. The ballot received a few comments which can be seen on Attachment Page 5.

Item Number: NB16-0102	NBIC Location: Part 1	Attachment Pages 13-16

General Description: Address post installation pressure testing

Subgroup: Installation

Task Group: S. Konopacki (PM), E. Wiggins, P. Cole, R. Smith, M. Wadkinson, D. Patten

July Meeting Action: Proposal - S. Konopacki (PM) presented a summary and held discussions amongst the SC. A break out session took place in the SG and a proposal was generated and presented. There was a motion to approve the proposal to the MC for letter ballot. The motion was unanimously approved.

Update: The proposal was balloted to Main Committee but failed to receive enough approval votes. Ballot comments can be seen on Attachment Page XXX.

Item Number: 18-2	NBIC Location: Part 1	No Attachment

General Description: Result of NB16-0101, add verbiage regarding commissioning fired boilers & fired pressure vessels with a calibrated combustion analyzer.

Subgroup: SG Installation
Task Group: E. Wiggins (PM), D. Patten, P. Schuelke, M. Wadkinson, and G. Halley

July Meeting Action: Progress Report - G. Halley shared background information and discussions took place amongst the SG & SC. A break out session took place in the SG and a proposal was generated and presented. After further discussions it was decided that further clarification and documenting is needed. G. Halley was added to the TG.

Item Number: 18-57	NBIC Location: Part 1	No Attachment

General Description: address the use & definition of the word inspector

Subgroup: SG Installation
Task Group: Brian Moore (PM), R. Smith, T. Griffin, P. Jennings, T. Creacy and R. Spiker

July Meeting Action: Progress Report - R. Smith presented a summary and held discussions amongst the SG and SC. As the TG continues to work on this item it is the intention of having a proposal to present at the meeting in January 2020.

Note: A new project manager should be designated for this item since Mr. Brian Moore is no longer involved with the committee.

Item Number: 19-45	NBIC Location: Part 1, S1	No Attachment

General Description: Revisions to Yankee Dryer Supplement Wording in Part 1

Subgroup: SG Installation

Task Group: R. Spiker (PM), J. Jessick, and D. Patten

Explanation of Need: Various technical and editorial revisions for S1.1, S1.2, and S1.4.

July Meeting Action: Progress Report - A TG was assigned to be R. Spiker (PM), J. Jessick, and D. Patten This item also affects Part 2 under item 19-46. Part 2 has separated these out into 3 separate items. V. Newton is the PM and will liaison between Part 1 and Part 2 so as to keep all informed. The scope is planned to be the first to be worked on.

Item Number: 19-49	NBIC Location: Part 1, 2.9 & 3.9	Attachment Page 17

General Description: Ensure shipping plugs for PRDs are removed during the installation process

Subgroup: Installation
Task Group: R. Smith (PM) and S. Konopacki

Explanation of Need: From the January 2019 main committee meeting, the discussion of PRD Item NB17-0401 led to the decision to open an item to address requirements to remove any shipping caps or plugs from pressure relief devices during the installation process.

July Meeting Action: Proposal - A TG was assigned to be R. Smith (PM) and S. Konopacki. A break out session took place in the SG and discussions were held amongst the SG and SC. A proposal was generated, presented and discussed. There was a motion to approve the proposal to the MC for voice vote. The motion was unanimously approved.

Update: The proposal was approved unanimously by SC Installation at the July meeting. However, Main Committee decided to send the proposal back to the subgroup to include language on "wired shut" lifting levers as they are often found still attached after installation.

Note: M. Wadkinson continues to work on the project regarding a review of Installation Requirements of CSD-1 to be put in Part I. A break out session was held and individuals of the TG were assigned to look over CSD-1 and Part I between meetings. **Task Group:** D. Patten, S. Konopacki, G. Tompkins, M. Wadkinson, R. Austin, K. Watson and P. Schulke

New Items:

Item Number: 19-77	NBIC Location: Part 1, 1.4.5.1.1	Attachment Page18

General Description: NBIC Part 1, 1.4.5.1.1 Guide for installation report, items 6, 10, and 20

Subgroup: SG Installation

Task Group: None

Explanation of Need: Cast aluminum boilers have been incorporated in ASME Section IV for a number of years now and it's time they be recognized in the NBIC. The installation report and guide were developed prior to cast aluminum boilers becoming an official part of ASME Section IV. It's suggested the guide item numbers and associated areas of the installation report be revised to incorporate cast aluminum boilers.

11. Future Meetings

- July 13th-16th, 2020 – Louisville, KY
- January 11th -14th, 2021 – TBD

12. Adjournment

Respectfully submitted,

Jonathan Ellis

Jonathan Ellis
NBIC Secretary

Contents

Subcommittee Installation

Last Name	First Name	Interest Category	Role	Exp. Date	More
Wadkinson	Melissa	Manufacturers	Chair	08/30/2021	Details
Patten	Don	Manufacturers	Vice Chair	02/27/2020	Details
Bock	Jeanne		Secretary	01/30/2099	Details
Austin	Randall	Users	Member	10/30/2022	Details
Creacy	Todd	Authorized Inspection Agencies	Member	01/30/2021	Details
Downs	James	Manufacturers	Member	10/30/2022	Details
Halley	Geoffrey	General Interest	Member	08/30/2021	Details
Konopacki	Stanley	Users	Member	01/30/2020	Details
Richards	H. Michael	General Interest	Member	08/30/2021	Details
Schuelke	Paul	Manufacturers	Member	01/30/2022	Details
Smith	Rex	Authorized Inspection Agencies	Member	01/30/2020	Details
Wiggins	Edward	Authorized Inspection Agencies	Member	01/30/2020	Details

Patrick Jennings - Director of Legislative Affairs
Hartford Steam Boiler Inspection and Insurance Company

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PO Box 5024
Hartford, CT 06102
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Patrick_Jennings@hsb.com

SUMMARY

Over thirty years working with boilers in a wide range of job positions including; Technical Subject Matter Expert, Business Development, Boiler Design, Firing System Design, Boiler Design, R&D, field service.

The past eight years have been with Hartford Steam Boiler (HSB) with most of that time as a subject matter expert (boiler) supporting the Insurance and Jurisdictional aspects of HSB's equipment breakdown business.

EXPERIENCE

Hartford Steam Boiler

Director of Legislative Affairs December 2018 to Present.

Working for the Inspection Services group, I interface with subjects related to jurisdictional issues primarily the interface between the statutes, regulations and inspection services work instructions. This includes resolution of jurisdictional issues with the chiefs as needed.

Principal Engineer July 2011 to December 2018

Technical Subject Matter Expert for boilers in support of insurance and jurisdictional inspections business units. Provided technical support to underwriting by developing standards and performing desktop reviews; claims by training, inspection services by training and direct consultation. Support for claims and underwriting included direct consultation for atypical areas or events relating to boilers or energy.

Alstom Power (ABB, Combustion Engineering)

Director of Business Development April 2009 to July 2011
Manager of Business Development April 2008 to April 2009

Led a group of seven proposal managers and one proposal publisher with responsibility for obtaining financial objectives of order intake and as-sold gross and net margins. Responsible for the commercial and technical aspects of all proposals issued from the group. I worked closely with the sales and engineering organizations to perform market analysis, identify opportunities, develop appropriate scope proposals, conduct technical and commercial risk reviews and negotiate contracts.

Consulting Engineer, Performance Design, May 2006 to April 2008

As a Performance Design Engineer (PDE), the job entailed working on pressure part proposals and contract execution. This involved engineering analysis and material selections for both the proposal and contract

phase. All jobs proposed and executed finished under budget, on schedule and met all performance targets. Lead author of the boiler portion of the retrofits chapter in the Alstom Power textbook, *Clean Combustion Technologies.*

Supervisor of Proposal Engineering, Sept. 2004 to May 2006

Technically responsible for all Boiler Retrofit (Windsor) proposals issued. The requirement was to ensure that all proposals have clearly identified scope of supply and performance conditions that support performance guarantees. Identify risk areas and potential mitigation strategies.

Business Development Manager, March 1999 to Sept. 2004

Responsible for capturing NOx reduction projects and related firing systems products from utility and industrial companies. As a Business Development Manager I obtained $65 Million in direct contracts with higher than average gross margins for the business unit. These contracts resulted in significant pull through work for construction, technical services and contract extras.

Principal Firing Systems Engineer, June 1994 to March 1999

Primarily responsible for the technical direction of proposals for Low NOx firing system projects that meet customer expectations and achieve guaranteed performance. Supported proposals for standard product lines and three first of a kind firing systems with responsibility for the safe design and project execution.

R&D Firing Systems Engineer, March 1990 to June 1994

Primarily responsible for proposing and executing firing system developmental projects in direct support of business unit requirements and government contracts with values up to four million dollars. Received a patent for technology developed.

Test Engineer, July 1986 to March 1990

As a field services test engineer for technical services working on utility boilers job responsibilities included; developing test plans, identifying resource requirements and executing test programs. I also supported NDE testing on the first Combustion Engineering CFB boiler.

EDUCATION

North Carolina State University, Raleigh NC - B.S. Mechanical Engineering – May 1986

PATENTS

US Patent 5,315,939 – One of the Top 100 Inventions of 1994; Popular Science Magazine

TECHNICAL PAPERS / WRITING (Selected)

Jennings, P; Ashman, J; Dejung, S; Gebert, T; Kolbe, C; Park, H; Popovic, C; Von Roth, D; Shepherd, M (2016). IMIA Working Group Paper 95(16) Supercritical Boilers, *49th Annual IMIA Conference*, Doha, Qatar.

Lead author on the Retrofits chapter in the Alstom Power *Clean Combustion Technologies* (2009) textbook.

Jennings, P. (2004). Alstom's Low NOx Firing Experience on Western Fuels. *Western Fuels Symposium.* Billings, MT.

Jennings, P. (2002). Low NOx Firing Systems and PRB Fuel; Achieving as low as 0.12 LB NOx/MBtu. *Institute of Clean Air Companies, Forum '02.* Houston, TX.

Gessner, T., Hoh, R., Ray, B., Dorazio, T., Sikorski, K., & Jennings, P. (1999). NOx Emissions Retrofit at Reliant Energy, W.A. Parish Generating Station, Unit 7: Achieving 0.15 lb/MBtu. *ASME International Joint Power Generation Conference.* San Francisco, CA.

Gessner, T., Hoh, R., Ray, B., Jennings, P., & Rebula, E. (1999). Results from Reliant Energy, W.A. Parish 7; Achieving < 0.15 lb/MBtu . *EPA-EPRI-DOE Combined Utility Air Pollutant Control Symposium: The Mega Symposium* . Atlanta, GA.

Jennings, P. (1993). Development and Testing of a High Efficiency Advanded Coal Combustor; Industrial Boiler Retrofit. *Proc. 11th International Pittsburgh Coal Conference.* Pittsburgh, PA.

Darroch, M., LaFlesh, R., Hart, D., & Jennings, P. (1991). "In-Furnace Low NOx Solutions for Wall Fired Boilers." *Spring Meeting, AFRC* . Hartford, CT.

Committee Member:	Daniel Marek	**Vote Date:**	2019-09-03	**Vote:**	Disapproved	**Uploads:**	

Member Comment:

SX.1: Does the Scope of this supplement limit the media stored in the composite vessel? Can the vessels be used in both gas and liquid applications?\

SX.4: If multiple media are allowed, should not piping load criteria be to the applicable Code, not limited to ASME B31.12 which applies to Hydrogen systems only.

SX.7 d): If the vessel is used for the storage of air or water, can a relief device with lifting lever be used?

SX.7 e): Are there any restrictions on location and size of openings? Minimum net flow area of opening?

SX.7 f): Built up backpressure requirement?

SX.7 g): Can the set point exceed MAWP when multiple relief devices are installed if allowed in the original Code of construction? Can the set point exceed MAWP when relief devices meant for fire protection only if allowed in the original Code of construction?

SX.7 h): Should not the capacity be sufficient to prevent overpressure in excess of that allowable by the original Code of construction?

Committee Member:	Thakor Patel	**Vote Date:**	2019-09-09	**Vote:**	Approved	**Uploads:**	

Member Comment:

I support Adam's comments and use the word MAWP instead of design pressure. The word "MAWP" used in the construction standard. Also specify the permissible overpressure for in the proposal.

Committee Member:	Adam Renaldo	**Vote Date:**	2019-08-12	**Vote:**	Approved	**Uploads:**	

Member Comment:

Change SX.7gCurrently:"g) The pressure relief device(s) shall be set at a pressure not exceeding the MAWP of the vessel. "Change to: "g) At least one pressure relief device shall be set at a pressure not exceeding the MAWP of the vessel. Additional pressure relief devices shall be set no higher than 105% of the MAWP of the vessel." The proposed edit will bring SX.7g into compliance with ASME Section VIII, Div 3, KR-162."KR-162 MULTIPLE PRESSURE RELIEF DEVICES If the required discharging capacity is supplied by more than one device, only one need be set to operate at a pressure not exceeding the design pressure of the vessel. The additional device or devices may be set at a higher pressure but not to exceed 105% of the design pressure of the vessel. The requirements of KR-150 shall also apply."

PM Reply:

I agree with the suggestion, but I think ASME Section X is the more appropriate wording; it's very close to the VIII-3 wording. RR-130 covers the same items as KR-150. I've made the change to the document and added it here as R2 for your review.

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

NB11-1901

SUPPLEMENT X
INSTALLATION OF HIGH PRESSURE COMPOSITE PRESSURE VESSELS

SX.1 SCOPE

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

a) Metallic vessel with a Fiber Reinforced Plastic FRP) hoop wrap over the shell part of the vessel both load sharing)

b) Metallic vessel with a full FRP wrap (both load sharing)

c) FRP vessel with a non-load sharing metallic liner

d) FRP vessel with a non-load sharing non-metallic liner

SX.2 SUPPORTS

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

SX.3 CLEARANCES

The pressure vessel installation shall allow sufficient clearance for normal operation, maintenance, and inspection. Stacking of pressure vessels is permitted. The minimum clear

space between pressure vessels shall be 1 ft. vertical and 2 ft. horizontal. Vessel nameplates shall be visible after installation for inspection. The location of vessels containing flammable fluids shall comply with NFPA 2. The vessel owner shall document the vessel pressure and pipe diameters used as a basis for compliance with NFPA 2 location requirements.

SX.4 PIPING LOADS

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

SX.5 MECHANICAL CONNECTIONS

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

SX.6 PRESSURE INDICATING DEVICES

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

SX.7 PRESSURE RELIEF DEVICES

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

a) Pressure relief devices shall be suitable for the intended service.

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

c) Dead weight or weighted lever pressure relief valves are prohibited.

d) Pressure relief valves shall not be fitted with lifting devices.

e) The pressure relief device shall be installed directly on the pressure vessel with no isolation valves between the vessel and the pressure relief device except:

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

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

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

animals, insects, rainwater, or other materials.

g) The pressure relief device(s) shall be set at a pressure not exceeding the MAWP of the vessel.

h) The pressure relief device(s) shall have sufficient capacity to ensure the pressure vessel does not exceed the MAWP of that specified in the original code of construction.

i) The owner shall document the basis for selection of the pressure relief device(s) used, including capacity.

j) The owner shall have such analysis available for review by the Jurisdiction.

k) Pressure relief devices and discharge piping shall be supported so that reaction forces are not transmitted to the vessel.

l) Heat detection system: a heat activated system shall be provided so that vessel contents will be vented per f) (above), if any part of the vessel is exposed to a temperature greater than 220ºF.

m) Positive methods shall be incorporated to prevent overfilling of the vessel.

SX.8 ASSESSMENT OF INSTALLATION

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

b) Vessels shall not be buried.

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

1) Ventilation

2) Inlet and outlet openings

3) Access to vessels

4) Clearances

5) Intrusion of ground water

6) Designed for cover loads

7) Explosion control

8) Ignition sources

9) Noncombustible construction

10) Remote monitoring for leaks, smoke, and fire

11) Remote controlled isolation valves

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

e) Installation locations shall provide the following:

1) Guard posts shall be provided to protect the vessels from vehicular damage per NFPA 2.

Protection from wind, seismic events shall be provided.

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

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

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

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

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

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

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

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

SX.9 LADDERS AND RUNWAYS

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

Action Item Request Form

2019 Main Committee Letter Ballot Comments:

Committee Member:	Joel Amato	**Vote Date:**	2019-07-31	**Vote:**	Disapproved	**Uploads:**	
Member Comment:	I disapprove this ballot because I believe the operational test on the completed installation must be witnessed by an inspector.						

Committee Member:	James Pillow	**Vote Date:**	2019-07-31	**Vote:**	Abstention	**Uploads:**	
Member Comment:	I'm sure that those that heard the discussions on this item are not confused, but 1.6.10c) is confusing to me. What boiler/PV component pressure test is not documented on the MDR when 1.6.10a) requires a pressure test of the COMPLETED boiler/PV?						

8.2 CODE REVISIONS OR ADDITIONS

Request for Code revisions or additions shall provide the following:

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

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

c) Background Information

Consolidation of Testing and Final Acceptance to Section 1 General.

Proposed Wording:

1.6.10 TESTING AND 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.~~

a) The completed boiler/ pressure vessel shall be pressure tested in the shop and/or in the field in accordance with the original code of construction and documented on the appropriate Manufacturer's Data Report.

b) 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. Prior to making the final closure the installer shall inspect the interior of the vessel and its appurtenances for the presence of foreign debris.

c) Subject to the jurisdictional requirements, a leak test may be performed on any components whose pressure test is not documented under the items' Manufacturer's Data Report. This leak test should not exceed 90% of the lowest pressure relief device setpoint. The test data shall be recorded, and the data made available as required.

d) Prior to final acceptance, an operational test shall be performed on the completed installation. The test shall include operating controls, limit controls and safety devices. The test data shall be recorded, and the data made available to the Jurisdictional Authorities as evidence that the installation complies with provisions of the governing code(s) of construction.

2.10.2 PRESSURE TEST

See NBIC Part 1, Section 1.6.10, *TESTING AND FINAL ACCEPTANCE*

~~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

See NBIC Part 1, Section 1.6.10, *TESTING AND FINAL ACCEPTANCE*

~~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

See NBIC Part 1, Section 1.6.10, *TESTING AND FINAL ACCEPTANCE*

~~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

See NBIC Part 1, Section 1.6.10, *TESTING AND FINAL 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

See NBIC Part 1, Section 1.6.10, *TESTING AND FINAL ACCEPTANCE*

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

Old wording that has been submitted as a letter ballot to the MC:

a) The completed boiler/ pressure vessel shall be pressure tested in the shop and/or in the field in accordance with the original code of construction.

b) 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. Prior to making the final closure. 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.

c) Subject to the jurisdictional requirements, Prior to final acceptance, an operational pressure test, with the approval of the jurisdiction if required, shall may be performed on any components whose pressure test is not documented under the items' Manufacturer's Data Report. This pressure test should not exceed 90% of the lowest pressure relief device setpoint. The test data shall be recorded and the data made available as required. This operational test may be used as the final acceptance of the unit.

Comments for Ballot: NB16-01-02	
Welch,Paul voted: Approve 10/19/2016 1:50:39 PM	I recommend approval with a minor change to the proposed wording in para b. second sentence to read: Prior to final acceptance, an operational test, with the approval of the Jurisdiction, shall be performed...
Pillow,James voted: Approve 10/6/2016 8:00:39 AM	I approve the proposal, but suggest a minor editorial change in last sentence of first paragraph as follows. Prior to making the final closures, the installer shall inspect the interior of the vessel and its appurtenances where possible for the presence of foreign debris.
Webb,Michael voted: Disapprove 10/5/2016 3:01:27 PM	At this time, I will vote to "disapprove" this item. My understanding of this action item was to; generally consolidate the pressure testing requirements of the various Part 1, Sections into a more general practice to be described in Part 1, Section 1-General Guidelines. In my read whether intended or my misunderstanding, the product of the SC-Installation effort may have offered the ASME code-required pressure testing to be circumvented as presented in the SC-proposed paragraph "b)". To add, I would propose for consideration the item as presented in the attachment or otherwise presented be inserted as: Part 1, Section 1, 1.4.1 b) with the current 1.4.1 b) re-introduced to become 1.4.1 c). As a note to the attachment: the text in red represents the text implying the operational test may satisfy final acceptance of the unit.–M. Webb, 10-5-16 Reference Document: NB16-0102-letter ballot Part 1 Section 1 G. Guidelines proposed 1.4.1. b, 10-5-16.pdf
Troutt,Robby voted: Disapprove 10/5/2016 8:09:44 AM	My disapproval is based on the lack of reference to a jurisdictional inspection prior to the operational test in paragraph (b). Some jurisdictions do not allow an operational test prior to the initial inspection.
Sekely,Jim voted: Approve 10/3/2016 1:07:21 PM	1.?? b): Change who's to whose

NBIC Part 1 Item 19-49

2.9.1 VALVE REQUIREMENTS – GENERAL (19)

a) Only direct spring loaded, pilot operated, or power actuated pressure relief valves designed to relieve steam shall be used for steam service.

b) Pressure relief valves shall be manufactured in accordance with a national or international standard.

c) Deadweight or weighted-lever pressure relief valves shall not be used.

d) For high-temperature water boilers, safety relief valves shall have a closed bonnet, and valve bodies shall not be constructed of cast iron.

e) Pressure relief valves with an inlet connection greater than NPS 3 (DN 80) used for pressure greater than 15 psig (103 kPa), shall have a flange or a welded inlet connection. The dimensions of flanges subjected to boiler pressure shall conform to the applicable standards.

f) When a pressure relief valve is exposed to outdoor elements that may affect operation of the valve, the valve may be shielded with a cover. The cover shall be vented and arranged to permit servicing and normal operation of the valve.

g) Shipping caps or plugs shall be removed prior to installation.

3.9.1 PRESSURE RELIEF VALVE REQUIREMENTS – GENERAL

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

a) Shipping caps or plugs shall be removed prior to installation.

Item 19-77: Request for Revision to NBIC Part 1, 1.4.5.1.1 6), 10), and 20)

Purpose	Cast aluminum boilers have been incorporated in ASME Section IV for a number of years now and it's time they be recognized in the NBIC.
Scope:	Part: Installation; Section: 1 ; Paragraph: 1.4.5.1.1 items 6, 10 and 20
Background:	The installation report and guide were developed prior to cast aluminum boilers becoming an official part of ASME Section IV. It's suggested the guide item numbers and associated areas of the installation report be revised to incorporate cast aluminum boilers.
Proposed Revision:	See below for the proposed revision.

1.4.5.1.1 GUIDE FOR COMPLETING NATIONAL BOARD BOILER INSTALLATION REPORT

1) INSTALLATION: Indicate the type and date of installation — new, reinstalled, or second hand.

2) INSTALLER: Enter the installer's name and physical address.

3) OWNER-USER: Enter the name and mailing address of the owner-user of the boiler.

4) OBJECT LOCATION: Enter the name of the company or business and physical address where the installation was made.

5) JURISDICTION NO.: Enter the Jurisdiction number if assigned at the time of installation.

6) NATIONAL BOARD NO.: Enter the assigned National Board number.
Note:
Cast-iron ~~section~~and cast aluminum boilers do not require National Board registration.

7) MANUFACTURER: Enter the boiler manufacturer's name.

8) MFG. SERIAL NO.: Enter the assigned boiler manufacturer's serial number.

9) YEAR BUILT: Enter the year the boiler was manufactured.

10) BOILER TYPE: Enter the type of boiler, e.g., watertube, firetube, cast iron, cast aluminum, electric, etc.

11) BOILER USE: Enter the service for which or for how the boiler will be used, e.g., heating (steam or water), potable water, etc.

12) FUEL: Enter the type of fuel, e.g., natural gas, diesel, wood, etc. If more than one fuel type, enter the types for which the boiler is equipped.

13) METHOD OF FIRING: Enter the method of firing, e.g., automatic, hand, stoker, etc.

14) Btu/KW INPUT: Enter the Btu/hr or kW input of the boiler.

15) Btu/KW OUTPUT: Enter the Btu/hr or kW output of the boiler.

16) OPERATING PSI: Enter the allowed operating pressure.

17) ASME CODE STAMP(S): Check the ASME Code stamp shown on the code nameplate or stamping of other certification mark (specify).

18) STAMPED MAWP: Enter the maximum allowable working pressure shown on the nameplate or stamping.

19) HEATING SURFACE SQ. FT.: Enter the boiler heating surface shown on the stamping or nameplate.
Note:
This entry is not required for electric boilers.

20) CAST IRON/ALUMINUM: Enter the total number of sections for cast-iron/cast aluminum boilers.
Note:
Not all cast boilers are sectional. Mono-block cast boilers should be described as having one (1) section.