Date Distributed: January 22, 2013

THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

NATIONAL BOARD SUBCOMMITTEE ON PRESSURE RELIEF DEVICES

MINUTES

Meeting of January 16, 2013
Mobile, Alabama

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The National Board of Boiler & Pressure Vessel Inspectors
1055 Crupper Ave.
Columbus OH 43229
Phone: (614) 888-8320
FAX: (614) 848-3474

COMMITTEE CORRESPONDENCE

1. CALL TO ORDER

The meeting was called to order at 8:00 AM on Wednesday January 16, 2013 by Chairman Frank Hart.

The following members and visitors were in attendance:

Members	Affiliation
J. Alton Cox	JAC Consulting, Inc.
Marrianne Brodeur	International Valve & Instrument Corp.
Frank Hart	Furmanite Worldwide
R.W. Donalson	Tyco Valves & Controls
Robert "Buddy" Dobbins	Zurich N.A.
Benjamin Anthony	State of Rhode Island
Raymond McCaffrey	Quality Valve, Inc.
Thomas P. Beirne, P.E.	National Board (Subcommittee Secretary)

Members Not Present	
Sid Cammeresi	Furmanite America
Thakor Patel	Farris Engineering
Denis DeMichael	DuPont
Kevin Simmons	Anderson Greenwood Crosby

Visitors	
Joseph F. Ball, P.E.	National Board
Kim Beise	Dowco Valve Co., Inc.
Addison Moore	JAC Consulting, Inc.
Adam Renaldo	Praxair, Inc.
Stan Harris	IVS
Bob Brantley	Chart, Inc.

2. ANNOUNCEMENTS

Mr. Hart announced the reception for Wednesday and introduced Mr. Beirne as the new Subcommittee Secretary.

3. ADOPTION OF THE AGENDA

The agenda dated December 17, 2012 was presented. Mr. Hart noted that there were public review comments previously assigned to other subcommittees that were reassigned to the PRD Subcommittee and will be added to this agenda. It was moved and seconded to approve the agenda with the addition of the public review comments. The motion was unanimously approved.

4. **REVIEW OF THE MINUTES**

It was moved and seconded to approve the minutes of the July 2012 meeting of the Subcommittee on Pressure Relief Devices. The motion was unanimously approved.

5. **REVIEW OF THE ROSTER**

It was noted that Mr. Dobbins' and Mr. Patel's memberships were up for renewal on 1/31/13. All members who were up for renewal were interested in continuing their membership. It was also noted that Mr. Brandon Nutter has applied for membership. The membership items are included on the main committee agenda for action.

6. **PUBLIC REVIEW COMMENTS**

PR13-0101: Comment from Randall Austin (Part 1, 4.7.3). After discussion a motion was made and seconded to reject Mr. Austin's comments. The motion was unanimously approved. The rational of the subcommittee was that all hot water storage tanks operate below 210 F. In the process of reviewing Mr. Austin's comments the subcommittee recommended to the main committee that editorial changes be made to the original text. See attachment A1 pages 2 and 3 for original comment and A1 page 13 for text changes.

PR13-0206: Comment from Francis Brown (Part 1, S3.6). After discussion a motion was made and seconded to reject Mr. Brown's first comment and accept his second comment with editorial changes and incorporate the changes into the 2013 Edition of the NBIC. This motion was unanimously approved. The rational of the subcommittee for rejecting Comment 1 was that UG-135(f) does not disallow the reduction of the outlet as long as the reduction does not drop the capacity below than what the system requires. See attachment A1 page 4 for original comment and pages 14, 15, and 16 for text changes.

PR13-0207: Comment from Francis Brown (Part 1, S3.6). After discussion a motion was made and seconded to accept Mr. Brown's comment and incorporate the changes into the 2013 Edition of the NBIC. The motion was unanimously approved. See attachment A1 page 5 for original comment and page 15 for text changes.

PR13-0208: Comment from Francis Brown (Part 2, 2.3.6.5(b)(2)) After discussion a motion was made and seconded to reject Mr. Brown's comment. The motion was unanimously approved. The rational of the subcommittee was that the hydrostatic relief valve is required since it is protecting the hose when it is isolated from the vessel. See attachment A1 page 6 for original comment.

PR13-0301: Comment from Alton Cox (Part 3, 4.5.3(c)). After discussion a motion was made and seconded to accept Mr. Cox's comment and incorporate the changes into the 2013 Edition of the NBIC. The motion was unanimously approved. See attachment A1 page 7 for original comment and page 17 for text changes.

PR13-0401: Comment from Brandon Nutter (Part 3, S7.10.5). After discussion a motion was made and seconded to accept Mr. Nutter's comment with editorial changes and incorporate the changes into the 2013 Edition of the NBIC. The motion was unanimously approved. See attachment A1 Page 8 for original comment and page 19 for text changes.

PR13-0402: Comment from Brandon Nutter (Part 3 1.7.3 through 1.7.8). After discussion a motion was made and seconded to accept Mr. Nutter's comment in principle. The motion was unanimously approved. See attachment A1 Page 9 for original comment

PR13-0404: Comment from Brandon Nutter (Part 3, 5.12.4). After discussion a motion was made and seconded to accept Mr. Nutter's comment with editorial changes and incorporate the changes into the 2013 Edition of the NBIC. The motion was unanimously approved. See attachment A1 Page 10 for original comment and page 18 for text changes.

PR13-0405: Comment from Brandon Nutter (Part 3, S7.10.1). After discussion a motion was made and seconded to accept Mr. Nutter's comment with editorial changes and incorporate the changes into the 2013 Edition of the NBIC. The motion was unanimously approved. See attachment A1 Page 11 for original comment and page 19 for text changes.

PR13-0602: Comment from Richard Craig (Part 1, S3.6). After discussion a motion was made and seconded to accept Mr. Craig's comment with editorial changes and incorporate the changes into the 2013 Edition of the NBIC. The motion was unanimously approved. See attachment A1 page 12 for original comment and page 15 for text changes.

7. INTERPRETATIONS

There were no interpretations for this meeting.

8. ACTION ITEMS

NB11-0401 Proposed Part 4, Pressure Relief Document

The subcommittee developed a background paragraph explaining the proposed part 4 along with five questions for a public opinion survey. See attachment A2 for the subcommittee background paragraph and questions.

NB12-0901 Part 3, Prepare guide for repair of tank vents

No progress was made on this item.

9. NEW BUSINESS

There was no new business for this meeting.

10. FUTURE MEETINGS

The next NBIC committee and subcommittee meetings will be held in Columbus, OH during the week of July 15, 2013. The subcommittee meeting will be on July 17, 2013.

January 2014	San Antonio, TX
July 2014	Columbus, OH

11. ADJOURNMENT

The meeting adjourned at approximately 2:30 PM.

Respectfully Submitted,

Thomas P. Beirne, P.E.
Secretary, NBIC Subcommittee Pressure Relief Devices

pc: D. Douin
D. Cook
R. Hough

Members Attendance:
SC _PRD
Main Committee

NBIC Committee Public Review Comments

PRC #	Reference Paragraph	Response	Vote A-D-AB-N	Action
PR13-0101	Part 1, 4.7.3	6	A-(unan.)	All hot water storage tanks operate below 210 F. Subcommittee made editorial changes to original text. See NBIC marked up draft.
PR13-0206	Part 1, S3.6	6 / 4	A-(unan.)	Comment 1: UG-135(f) allows reducing the outlet as long as it doesn't reduce the capacity below what is required to protect the pressure vessel. Comment 2: Accepted
PR13-0207	Part 1, S3.6	4	A-(unan.)	See NBIC marked up draft
PR13-0208	Part 2, 2.3.6.5	6	A-(unan.)	The hydrostatic relief valve protects the hose when isolated from pressure vessel.
PR13-0301	Part 3, 4.5.3	4	A-(unan.)	See NBIC marked up draft
PR13-0401	Part 3, S7.10.5	4	A-(unan.)	See NBIC marked up draft
PR13-0402	Part 3, 1.7.3.1	3	A-(unan.)	Sub-committee agreed with commenter, but recognizes pressure to remove administrative requirements.
PR13-0404	Part 3, 5.12.4	4	A-(unan.)	See NBIC marked up draft
PR13-0405	Part 3, S7.10.1	4	A-(unan.)	See NBIC marked up draft
PR13-0602	Part 1, S3.6	4	A-(unan.)	See NBIC marked up draft

1. Accepted comment, will incorporate into next draft
2. Accepted comment, no revision required
3. Accepted in principle
4. Accepted, changes are incorporated
5. Accepted for new business action
6. Rejected

Attachment A1

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Submission of Public Review Comment
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Comments Must be Received No Later Than: December 17, 2012

Instructions: If unable to submit electronically, please print this form and fax or mail. Print or type clearly.

Date: 11/20/2012

Commenter Name: Randall Austin

Commenter Address: 800 W. Washington St., Phoenix, AZ 85007

Commenter Phone: 602-542-1648

Commenter Fax: 602-542-1614

Commenter Email: raustin@ica.state.az.us

Section/Subsection Referenced: 4.7.3 SAFETY RELIEF DEVICES

Comment/Recommendation: *Proposed Solution:* ☐ New Text ☒ Revise Text ☐ Delete Text

4.7.3 SAFETY RELIEF DEVICES

~~a) Each hot water storage tank shall be equipped with an ASME-NB-approved temperature and pressure relieving device set at a pressure not to exceed the maximum allowable working pressure and 210°F.~~

b) The temperature and pressure relieving device shall meet the requirements of NBIC Part 1, 4.5.

4.7.3 SAFETY RELIEF DEVICES

a) Each hot-water storage tank that is designed to operate at or below 210°F (99°C) and served by a hot-water supply boiler, shall have a temperature relief valve installed and set to relieve at or below 210°F (99°C). This valve shall be installed within the top 6 in. (150 mm) of the system's hot-water storage tank.

b) The temperature and pressure relieving device shall meet the requirements of NBIC Part 1, 4.5.

Source: ☒ Own Experience/Idea ☒ Other Source/Article/Code/Standard CSD-1 (2012)CW-520(b) Requirements of Hot-Water Supply Boilers

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Commenter No. Issued: PR13-01

Comment No. Issued: 01

Committee Referred To: SC Installation

Reason for changing text: (proposed text was borrowed in part from ASME, CSD-1, CW-520(b), with modifications, see below.)

(Item 1)

The first part requires only ASME approved PRD, "shall be equipped with an ASME" NB "approved". When paragraph (b) requires to meet Part 1, 4.5., Part 1, 4.5.1 (see below) requires "national or international standard", I feel there is a conflict here. At this point in time the National Board approves no PRD's other than ASME constructed and stamped objects, but that does not say next week this may change, but hot-water storage tanks could only use an ASME stamped T&P valve.

4.5.1 DEVICE REQUIREMENTS

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

(Item 2)

Requiring all hot water storage tanks be installed with a T&P valve would restrict those tanks designed to operate above the 210°F. ASME Code Section VIII, Division 1 permits a stainless steel tank to have a MAWT of 650°F. If an owner purchases a hot water supply boiler (Section IV) with an MAWT of 250°F and a storage tank (Section VIII, Division 1) with an MAWT of 650°F because there process requires a final rinse of 230°F, they could not use a hot-water storage tank in the system, because of the T&P valve having a lift set at 210°F.

(Item 3)

Removing the reference to the MAWP was because NBIC, Part 1, 4.5.5(a) already states this requirement.

(Item 4)

NBIC, Part 1, 4.5.3 has no specific reference to the installation location of a T&P valve on hot-water storage tanks. This is the reason for the " installed within the top 6 in." reference.

CSD-1, CW-520 Requirements of Hot-Water Supply Boilers

(a) Each hot-water supply boiler shall have at least one officially rated safety relief valve mounted directly on the boiler and set to relieve at or below the maximum allowable working pressure of the boiler. The required steam-relieving capacity in Btu/hr (W) shall equal or exceed the maximum Btu/hr (W) output rating of the boiler.

(b) Each hot-water system consisting of a hot-water supply boiler and hot-water storage tank served by a hot-water supply boiler that is designed to operate at or below 210°F (99°C) shall have a temperature relief valve installed and set to relieve at or below 210°F (99°C). This valve shall be installed either in combination with that required in (a) above or within the top 6 in. (150 mm) of the system's hot-water storage tank.

(c) Safety relief valves shall be installed and tested in accordance with the ASME Boiler and Pressure Vessel Code. Temperature relief valves shall be rated, tested, and installed in accordance with ANSI Z21.22/CSA 4.4 and combination pressure-temperature relief valves in accordance with ANSI Z21.22/CSA 4.4 for temperature and the ASME Boiler and Pressure Vessel Code for pressure.

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Instructions: If unable to submit electronically, please print this form and fax or mail. Print or type clearly.

Date: 12-7-12

Commenter Name: Francis Brown

Commenter Address: 1055 Crupper Avenue

Columbus, OH 43229

Commenter Phone: 614-431-3226

Commenter Fax: 614-431-3208

Commenter Email: fbrown@nationalboard.org

Section/Subsection Referenced: Part 1 S3.6

Comment/Recommendation: *Proposed Solution:* ☐ New Text ☒ Revise Text ☐ Delete Text

S3.6 Relief Valves- Two comments: 1) the note concerning the discharge line does not comply with ASME Code. A line smaller in diameter than the relief valve will increase the back pressure and reduce the flow. 2) the sizing of discharge lines need to be moved to the paragraph on Safety Relief/Vent Lines.

Source: ☒ Own Experience/Idea ☐ Other Source/Article/Code/Standard _____

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Commenter No. Issued: PR13-02

Comment No. Issued: 06

Committee Referred To: SC Installation

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Date: 12/7/12

Commenter Name: Francis Brown

Commenter Address: 1055 Crupper Avenue

Columbus, OH 43229

Commenter Phone: 614-431-3226

Commenter Fax: 614-431-3209

Commenter Email: fbrown@nationalboard.org

Section/Subsection Referenced: Part 1 S3.6

Comment/Recommendation: *Proposed Solution:* ☐ New Text ☒ Revise Text ☐ Delete Text

Safety Relief/Vent Lines: The term "PRD" is located in the third line, and is the only place in S3.6. For consistency, change "relief valves" and "relief" to "PRD", or change "PRD" to "Relief Valve".

Source: ☒ Own Experience/Idea ☐ Other Source/Article/Code/Standard _____

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Commenter No. Issued: PR13-02

Comment No. Issued: 07

Committee Referred To: SC Installation

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Date: 12/11/12

Commenter Name: Francis Brown

Commenter Address: 1055 Crupper Avenue

Columbus, OH 43229

Commenter Phone: 614-431-3226

Commenter Fax: 614-431-3208

Commenter Email: fbrown@nationalboard.org

Section/Subsection Referenced: Part 2: 2.3.6.5(b)(2)

Comment/Recommendation: *Proposed Solution:* ☐ New Text ☒ Revise Text ☐ Delete Text

The hydrostatic relief valve is not part of the nurse tank but is in the plumbing and typically mounted on the toolbar. Also, it is bad practice to mount a valve on a valve in these types of applications without support for the valves. Why the high set pressure for this valve? The pressure relief valve (set pressure around 250 psi) will have vented preventing the pressure in the vessel from reaching the set pressure of the hydrostatic relief valve.

Source: ☒ Own Experience/Idea ☐ Other Source/Article/Code/Standard _____

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Commenter No. Issued: PR13-02

Comment No. Issued: 08

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Comments Must be Received No Later Than: December 17, 2012

Instructions: If unable to submit electronically, please print this form and fax or mail. Print or type clearly.

Date: DEC 6, 2012

Commenter Name: J. ALTON COX

Commenter Address: 213 PARK VIEW DRIVE
BELMONT, NC 28012

Commenter Phone: 704-301-8532

Commenter Fax: 704-820-8408

Commenter Email: alton@jaltoncox.com

Section/Subsection Referenced: PART 3, Para. 4.5.3 (c)

Comment/Recommendation: *Proposed Solution:* ☐ New Text ☒ Revise Text ☐ Delete Text

(Second Sentence)

This qualification shall be documented and provisions made to retain such documentation for a period of at least five years after the lift device is retired. Documentation of this qualification shall include but not be limited to:

We should add "assist" or delete "lift" for consistency, i.e. Lift Assist Device or just plain device rather than Lift Device. It is called Lift Assist Device everywhere else in the Document.

Source: ☒ Own Experience/Idea ☐ Other Source/Article/Code/Standard

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Commenter No. Issued: PR13-03

Comment No. Issued: 01

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Comments Must be Received No Later Than: December 17, 2012

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Date: December 7, 2012

Commenter Name: Brandon Nutter

Commenter Address: 5401 Jefferson Davis Hwy - SPOT 611
Richmond, VA 23234

Commenter Phone: (804) 383-3835

Commenter Fax: (804) 383-4206

Commenter Email: Brandon.K.Nutter-1@dupont.com

Section/Subsection Referenced: NBIC Part 3, Para S7.10.5

Comment/Recommendation: *Proposed Solution:* ☐ New Text ☒ Revise Text ☐ Delete Text

Only external adjustments to restore the set pressure shown on the repair nameplate or unmodified original nameplate or stamping and/or performance of a pressure relief valve shall be made under the provisions of NBIC Part 3, S7.10.1 and Part 2, 2.5.7.

Reasoning: Clarification to ensure that the adjustment is made only to return the valve to its current set pressure. If the valve previously underwent a set pressure change properly executed under a "VR" repair, the adjustment should be to the set pressure marked on the repair nameplate, not the original nameplate set.

Source: ☒ Own Experience/Idea ☐ Other Source/Article/Code/Standard

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Commenter No. Issued: PR13-04

Comment No. Issued: 01

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Commenter Address: 5401 Jefferson Davis Hwy - SPOT 611
Richmond, VA 23234

Commenter Phone: (804) 383-3835

Commenter Fax: (804) 383-4206

Commenter Email: Brandon.K.Nutter-1@dupont.com

Section/Subsection Referenced: NBIC Part 3, Para 1.7.3 - 1.7.8

Comment/Recommendation: *Proposed Solution:* ☐ New Text ☒ Revise Text ☐ Delete Text

Do not remove these sections. Leave existing text. These are requirements related to the "VR" program and should remain in the NBIC. If the intention is to move these requirements to another document other than the NBIC, I would also oppose that action as all aspects of the "VR" program should be subject to the oversight of the consensus NBIC committee and subcommittees. Additionally, such action would likely require "VR" programs to obtain and track an additional National Board document, creating additional and unnecessary burden.

Source: ☒ Own Experience/Idea ☐ Other Source/Article/Code/Standard _____

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Commenter No. Issued: PR13-04

Comment No. Issued: 02

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Commenter Name: Brandon Nutter

Commenter Address: 5401 Jefferson Davis Hwy - SPOT 611

Richmond, VA 23234

Commenter Phone: (804) 383-3835

Commenter Fax: (804) 383-4206

Commenter Email: Brandon.K.Nutter-1@dupont.com

Section/Subsection Referenced: NBIC Part 3, Para 5.12.4

Comment/Recommendation: *Proposed Solution:* ☐ New Text ☒ Revise Text ☐ Delete Text

Where a valve has been tested and adjusted to restore the set pressure shown on the repair nameplate or unmodified original nameplate or stamping, as permitted by NBIC Part 3, S7.10.1, but not otherwise repaired, a "Test Only" nameplate shall be applied that contains the following information:

Reasoning: Clarification to ensure that the adjustment is made only to return the valve to its current set pressure. If the valve previously underwent a set pressure change properly executed under a "VR" repair, the adjustment should be to the set pressure marked on the repair nameplate, not the original nameplate set.

Source: ☒ Own Experience/Idea ☐ Other Source/Article/Code/Standard _____

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Commenter No. Issued: PR13-04

Comment No. Issued: 04

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Commenter Name: Brandon Nutter

Commenter Address: 5401 Jefferson Davis Hwy - SPOT 611
Richmond, VA 23234

Commenter Phone: (804) 383-3835

Commenter Fax: (804) 383-4206

Commenter Email: Brandon.K.Nutter-1@dupont.com

Section/Subsection Referenced: NBIC Part 3, Para S7.10.1

Comment/Recommendation: *Proposed Solution:* ☐ New Text ☒ Revise Text ☐ Delete Text

The Jurisdiction may authorize properly trained and qualified employees of boiler and pressure vessel owners/users or their designees to confirm or restore the set pressure shown on the repair nameplate or unmodified original nameplate or stamping and/or performance of pressure relief valves. ...

Reasoning: Clarification to ensure that the adjustment is made only to return the valve to its current set pressure. If the valve previously underwent a set pressure change properly executed under a "VR" repair, the adjustment should be to the set pressure marked on the repair nameplate, not the original nameplate set.

Source: ☒ Own Experience/Idea ☐ Other Source/Article/Code/Standard

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Commenter No. Issued: PR13-04

Comment No. Issued: 05

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Instructions: If unable to submit electronically, please print this form and fax or mail. Print or type clearly.

Date: December 14, 2012

Commenter Name: Richard Craig, CGA Technical Director

Commenter Address: The Compressed Gas Association, Inc.
14501 George Carter Way, Suite 103, Chantilly, VA 20151

Commenter Phone: (703) 788-2730

Commenter Fax: 703-961-1831

Commenter Email: rcraig@cganet.com

Section/Subsection Referenced: Supplement 3, S3.6, Valves, Piping, Tubing and Fittings

Comment/Recommendation: *Proposed Solution:* ☐ New Text ☒ Revise Text ☐ Delete Text

S3.6 VALVES, PIPING, TUBING AND FITTINGS

Safety Relief/Vent Lines-Safety relief/vent lines shall be as short and straight as possible with a continuous routing to an unenclosed area outside the building and installed in accordance with the manufacturer's instructions. The vent line shall be a continuous run from the vessel PRD vent piping to the outside vent line discharge fitting~~, without any splices~~. Mechanical joints in metallic piping and tubing shall be visible and inspectable. Any splices in plastic or polymeric tubing shall be done within three feet of the vessel and must be visible and inspectable. These lines shall be free of physical defects such as cracking or kinking and all connections shall be securely fastened to the LCDSV and the fill box. The minimum size and length of the lines shall be in accordance with table S3.6a and S3.6b. Fittings or other connections may result in a localized reduction in diameter have been factored into the lengths given by the tables S3.6a and S3.6b.

Rationale: Allows the use of connectors but requires that they are seen and can be inspected for verification of integrity.

Source: ☒ Own Experience/Idea ☐ Other Source/Article/Code/Standard _____

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Commenter No. Issued: PR13-06 Committee Referred To:

Comment No. Issued: 02 SC Installation

4.2 DEFINITIONS

~~Pressure vessels are containers other than boilers or piping used for the containment of pressure.~~

See the Glossary in NBIC Part 1, Section 9.

NB12-0301

4.7 REQUIREMENTS FOR HOT WATER STORAGE TANKS

4.7.1 SUPPORTS

Each hot water storage tank shall be supported in accordance with NBIC Part 1, 4.3.1.

4.7.2 CLEARANCE AND ACCEPTABILITY

a) The required nameplate (marking or stamping) should be exposed and accessible.

b) The openings when required should be accessible to allow for entry for inspection and maintenance.

c) Each hot water storage tank shall meet the requirements of NBIC Part 1, 4.3.2.

PR13-0101

4.7.3 SAFETY RELIEF DEVICES

certified

a) Each hot water storage tank shall be equipped with an ASME NB ~~approved~~ temperature and pressure relieving device set at a pressure not to exceed the maximum allowable working pressure and 210°F.

b) The temperature and pressure relieving device shall meet the requirements of NBIC Part 1, 4.5.

4.7.4 THERMOMETERS

a)Each hot water storage tank shall be equipped with a thermometer.

b) Each hot water storage tank shall have a thermometer so located that it shall be easily readable at or near the outlet. The thermometer shall be so located that it shall at all times indicate the temperature of the water in the storage tank.

4.7.5 SHUT OFF VALVES

a) Each hot water storage tank shall be equipped with stop valves in the water inlet piping and the outlet piping in order for the hot water storage tank to be removed from service without having to drain the complete system.

b) Each hot water storage tank shall be equipped with a bottom drain valve to provide for flushing and draining of the vessel.

located and such signage shall contain at minimum the following information: Carbon Dioxide Monitors for general area monitoring (not employee personal exposure monitoring) are provided in this area. These monitors are set to alarm at 15,000ppm (1.5% concentration) for the low level alarm and at 30,000ppm (3% concentration) for high level alarm.

Low Level Alarm (15,000ppm) – Provide appropriate cross ventilation to the area. Personnel may enter area for short periods of time (not to exceed 15 minutes at a time) in order to identify and repair potential leaks.

High Level Alarm (30,000ppm) – Personnel should evacuate the area and nobody should enter the affected area without proper self contained breathing apparatus until the area is adequately ventilated and the concentration of CO2 is reduced below the high alarm limit.

S3.6 VALVES, PIPING, TUBING AND FITTINGS

Materials - Materials selected for valves, piping, tubing, hoses and fittings used in the LCDSV system shall meet following requirements:

a) Components must be compatible for use with CO2 in the phase, (gas, or liquid) it encounters in the system.
b) Components shall be rated for the operational temperatures and pressures encountered in the applicable circuit of the system.
c) Shall be stainless steel, copper, brass, or plastic/polymer materials rated for CO2.
d) Only fittings and connections recommended by the manufacturer shall be used for all hoses, tubes, and piping.
e) All valves and fittings used on the LCDSV shall be rated for the maximum allowable working pressure stamped on the tank.
f) All piping, hoses and tubing used in the LCDSV system shall be rated for the working pressure of the applicable circuit in the system and have a burst pressure rating of at least four times the maximum allowable working pressure of the piping, hose or tubing.

Relief Valves – Each LCDSV shall have at least one ASME/NB stamped & certified relief valve with a pressure setting at or below the MAWP of the tank. The relief valve shall be suitable for the temperatures and flows experienced during relief valve operation. The minimum relief valve capacity shall be designated by the manufacturer Additional relief valves that do not require ASME stamps may be added per Compressed Gas Association pamphlet, CGA S-1.3 Pressure Relief Device Standards Part 3, Stationary Storage Containers for Compressed Gases, recommendations. Discharge lines from the relief valves shall be sized in accordance with tables S3.6a & S3.6b Note: due to the design of the LCDSV the discharge line may be smaller in diameter than the relief valve outlet size.

Caution: Company's and or individuals filling or refilling LCDSV's shall be responsible for utilizing fill equipment that is acceptable to the manufacture to prevent over pressurization of the vessel.

Isolation Valves - Each LCDSV shall have an isolation valve installed on the fill line and tank discharge, or gas supply line in accordance with the following requirements:

a) Isolation valves shall be located on the tank or at an accessible point as near to the storage tank as possible.

Move to Safety/ Relief Vent Lines

PR13-0206

Alternatively, a) Mechanical joints in metallic piping and tubing may be used provided they are visible and inspectable. b) Any splices in plastic or polymeric tubing shall be done within three feet of the vessel and shall be visible and inspectable. PR13-0602

d) Gas Supply and Liquid CO2 Fill Valves shall be clearly marked for easy identification.

the vessel safety relief valve to the

PR13-0207

Safety Relief/Vent Lines-Safety relief/vent lines shall be as short and straight as possible with a continuous routing to an unenclosed area outside the building and installed in accordance with the manufacturer's instructions. The vent line shall be a continuous run from ~~PRD to~~ outside vent line discharge fitting ~~without any splices~~. These lines shall be free of physical defects such as cracking or kinking and all connections shall be securely fastened to the LCDSV and the fill box. The minimum size and length of the lines shall be in accordance with table S3.6a and S3.6b. Fittings or other connections may result in a localized reduction in diameter have been factored into the lengths given by the tables S3.6a and S3.6b.

NB13-0101

Note: Due to the design of the LCDSV the discharge line may be smaller in diameter than the relief valve outlet size, *but shall not be smaller than that shown in tables S3.6 a) and b)* PR13-0206

S3.6.1 System D

The Liquid Carbon Dioxide Beverage systems include the Liquid Carbon Dioxide Storage Vessel or LCDSV (tank) and associated sub-system circuits - Liquid CO2 fill circuit, and associated sub-system circuits and Pressure relief / vent line circuit. The LCDSV s are vacuum insulated pressure vessels, constructed of stainless steel, with Super Insulation wrapping between the inner pressure vessel and the outer vacuum jacket. (See Figure ....) These Pressure vessels are typically designed for a Maximum Allowable Working Pressure (MAWP) of either 300 psig (2068 kPa) or 283 psig (1951 kPa). The LCDSV come equipped with a ASME/NB certified "UV" Primary Relief Valve (PRV) set at or below the MAWP of the vessel. Additionally as recommended by the Compressed Gas Association pamphlet CGA S-1.3, (PRESSURE RELIEF DEVICE STANDARDS PART 3 - STATIONARY STORAGE CONTAINERS FOR COMPRESSED GASSES) a secondary relief valve may be installed. This secondary relief valve is beyond the scope of ASME Section VIII, Division 1 and is not required to be ASME/NB stamped and certified. This additional PRV is typically rated no higher than 1.5 times the vessel MAWP.

Operating conditions of the system, components, and inner pressure vessel can vary between cause temperatures and pressures to range from 90 psig (-56° F) to and 300 psig (+2°F) {620 kPa (-49°C) to 2068 kPa (-16°C)}.. Below about 60 psig (413 kPa) in the tank, liquid CO2 begins changing to solid phase (dry ice). If the tank becomes completely depressurized to 0 psig, temperatures inside the tank could reach -109°F (-78°C),(solid dry ice). When liquid CO2 turns to solid dry ice in a completely depressurized tank, all CO2 gas flow in the system ceases and the tank becomes nonfunctional. See the attached CO2 Phase Diagram figure ~~Figure 4.6.xxxS3.2xxx~~3.6.1, showing the typical operating range of these systems. Components external to the LCDSV inner tank pressure vessel may encounter pressures and temperatures between 90 psig, and -56°F to 300 psig and +2°F, respectively {between 620 kPa, and -49°C to 2068 kPa and -16°C, respectively}.

Move table headings to top.

Tank Size (Pounds)	Fire Flow Rate Requirements (Pounds per Minute)	Maximum length of 3/8 inch ID Nominal Metallic Tube Allowed	Maximum Length of ½ inch Metallic Tube Allowed
Less than 500	2.60 maximum	80 feet	100 feet
500-750	3.85 maximum	55 feet	100 feet
Over 750-1000	5.51 maximum	18 feet	100 feet

Table S3.6a) Minimum LCDSV System Safety Relief /Vent Line Requirements (Metallic)

Tank Size (Pounds)	Fire Flow Rate Requirements (Pounds per Minute)	Maximum length of 3/8 inch ID plastic/polymer materials Tube Allowed	Maximum Length of ½ inch ID plastic/polymer materials Tube Allowed
Less than 500	2.60 maximum	100 feet	100 feet
500-750	3.85 maximum	100 feet	100 feet
Over 750-1000	5.51 maximum	N/A see ½ inch	100 feet

Table S6.3b) Minimum LCDSV System Safety Relief/Vent Line Requirements (plastic/polymer)

3.6

Tank Size (Kg)	Fire Flow Rate Requirements (Kg per Minute)	Maximum length of 10mm ID Nominal Metallic Tube Allowed	Maximum Length of 13mm Metallic Tube Allowed
Less than 227	1.18 maximum	24 m	30.5 m
227-340	1.75 maximum	17 m	30.5 m
Over 340-454	2.50 maximum	5.5 m	30.5 m

ID

Table S3.6 a) Metric Minimum LCDSV System Safety Relief /Vent Line Requirements (Metallic)

Tank Size (kg)	Fire Flow Rate Requirements (kg per Minute)	Maximum length of 10 mm ID Nominal Metallic Tube Allowed	Maximum Length of 13 mm ID plastic/polymer materials Tube Allowed
Less than 227	1.18 maximum	30.5 m	30.5 m
227-340	1.75 maximum	30.5 m	30.5 m
Over 340-454	2.5 maximum	N/A see 13 mm	30.5 m

Table S3.6 b) Metric Minimum LCDSV System Safety Relief/Vent Line Requirements (plastic/polymer)

Note: Due to the design of the LCDSV the discharge line may be smaller in diameter than the relief valve outlet size, *but shall not be smaller than that shown in tables S3.6 a) and b)*

PR13-0206

2) the device and test procedures that have proved to give accurate results are used and followed; Pg. 17/19

3) a static inlet pressure is applied with the test medium specified in 4.5.1; and

4) adjustments are made in accordance with the valve manufacturer's recommendations to ensure proper lift and blowdown.

assist PR13-0301

c) Prior to use, all lift assist devices shall be qualified by the certificate holder to ensure that the equipment and testing procedures will provide accurate results when used within the ranges established for that equipment used for verification testing as specified in the quality system or comparisons to field performance. This qualification shall be documented and provisions made to retain such documentation for a period of at least five years after the lift device is retired. Documentation of this qualification shall include but not be limited to:

1) A description of the lift assist device including model number, serial number and manufacturer

2) Size and pressure ranges of valves to be tested with the lift assist device and the test fluid to be used. Note: Maximum set pressure is determined by available lift force and system pressure.

3) Accuracy of pressure measuring equipment;

4) Method of qualifying

d) After initial qualification of the device the device shall be re-qualified if:

1) Modifications or repairs to the device are made Which would affect test results

2) The manufacturer issues a mandatory recall or modification to the device which will affect test results.

NB10-0701 (cont.)

5.2 DOCUMENTATION

a) Repairs that have been performed in accordance with the NBIC shall be documented on a Form R-1, *Report of Repair*, as shown in this section. A Form R-4, *Report Supplementary Sheet*, shall be used as needed to record additional data when the space provided on Form R-1 is not sufficient.

b) Alterations performed in accordance with the NBIC shall be documented on a Form R-2, Report of Alteration, as shown in this section. A Form R-4, Supplementary Sheet, shall be used as needed to record additional data when the space provided on Form R-2 is not sufficient.

c) ~~For those "R" Forms not registered with the National Board~~, The organization performing repairs and alterations shall retain a copy of the completed Form "R" Report ~~Form~~ on file and all records and documentation substantiating the summary of work as described throughout Section 5, and as identified in the "R" Certificate Holder's Quality System Manual.

5.5 REGISTRATION OF "R" FORMS

-GENERAL

a) When registration of the Form "R" Report is required, the "R" Certificate Holder performing a repair or alteration shall submit the completed Form "R" Report, meeting the requirements of the Code, to the National Board.

b) When registration of the Form "R" Report is not required by the Code, the "R" Certificate Holder may register the completed Form "R" Report , meeting the requirements of the Code, with the National Board.

1) The "R" Certificate Holder should be aware that some Jurisdictions may require registration of repairs and alterations with the National Board.

c) ~~For those "R" Forms not registered with the National Board, the organization performing repair or alterations shall retain a copy of the "R" Form on file for a minimum period of five years.~~

5.5.2 REGISTRATION FOR ALTERATIONS

b) If the item was not registered with the National Board, one original Form R-2, together with attachments, may be registered with the National Board or retained as required by The Quality System Manual

NB11-0303

5.8.2 STAMPING FOR ALTERATIONS

PR13-0404

The nameplate shall be applied in accordance with NBIC Part 3, 5.7. Location of nameplate shown on the unmodified original nameplate or stamping, or repair nameplate documented under "Remarks" on NBIC Form R-2 line 9,.

NB10-1402

5.12.4 TEST ONLY NAMEPLATE

a) Where a valve has been tested and adjusted to restore the ~~Nameplate~~ set pressure, as permitted by NBIC Part 3, S7.10.1, but not otherwise repaired, a "Test Only" nameplate shall be applied that contains the following information:
1) Name of responsible organization;
2) Date of test;
3) Set Pressure; and
4) Identification, such as "Test Only."

NB10-1701 and NB12-2001

5.13.4.1

Box 12 Instructions:
12. Provide a detailed summary describing the scope of work that was completed to a Pressure Retaining Item (PRI). The information to be considered when describing the scope of work should include such items as, the nature of the repair or alteration (i.e. welding, bonding, cementing), the specific location of the work performed to the PRI, the steps taken to remove a defect or as allowed by 3.3.4.8 to remain in place, the method of repair or alteration described as listed in the examples of Part 3, Section 3 or supplemental section if applicable, and the acceptance testing and or examination method used in accordance with the NBIC. When additional space is needed to describe the scope of work, a Form R-4 shall be used and attached. Information determined to be of a proprietary nature need not be included, but shall be stated on Form,.

NB10-0502

STEAM LOCOMOTIVE FIRETUBE BOILER REPAIRS

S1.1 GENERAL REQUIREMENTS

This ~~part~~ Supplement applies to all boilers attached to steam locomotives operating on track gaged 24" and greater.

PR13-0401/PR13-0405

shown on the unmodified original nameplate or stamping, or repair nameplate

NB10-1402

S7.10.1 GENERAL

The Jurisdiction may authorize properly trained and qualified employees of boiler and pressure vessel owners/users or their designees to confirm or restore ~~nameplate~~ set pressure and/or performance of pressure relief valves. All external adjustments shall be resealed with a seal identifying the responsible organization and a metal tag that identifies the organization and the date the adjustment shall be installed.

S7.10.5 EXTERNAL ADJUSTMENTS

Only external adjustments to restore the ~~required nameplate~~ set pressure and/or performance of a pressure relief valve shall be made under the provisions of NBIC Part 3, S7.10.1 and Part 2, 2.5.7.

Attachment A2
NBIC PRD Subcommittee Survey Questions 1/16/13

The NBIC is considering consolidating all of the pressure relief device requirements currently in Parts 1, 2, and 3 into a new Part 4. This action will provide a single point of access for all pressure relief device requirements. Specific references to these requirements will be included in Parts 1, 2, and 3. Also note that by adding a Part 4 there will not be an additional cost. The National Board is conducting a survey to gauge opinion on creating a Part 4. Your input is greatly appreciated.

1) Please define your category of NBIC user (Check all that apply).
   - NB Commissioned Inspector
   - NB Owner/User Commissioned Inspector
   - Owner/User
   - VR Certificate Holder
   - R Certificate Holder
   - Pressure Retaining Item Manufacturer
   - Valve Manufacturer/Assembler
   - Other (Specify)

2) What is your preferred format for using the NBIC?
   - Hardcopy
   - Electronic- Single File (All parts combined)
   - Electronic- Multiple Files (One file per part)

3) How often do you refer to the NBIC?
   - Daily
   - Weekly
   - Monthly
   - Seldom

4) Which parts of the NBIC do you currently use?
   (Check all that apply)
   - Part 1
   - Part 2
   - Part 3

5) Having all requirements for installation, inspection, and repair of pressure relief devices in a single separate part of the NBIC would make your job_____
   - Easier
   - More Difficult
   - No Different
   - (If more difficult, please explain)

6) Any additional comments regarding this survey