

Date Distributed: January 20, 2016



**THE  
NATIONAL  
BOARD**  
OF BOILER AND  
PRESSURE VESSEL  
INSPECTORS

# **NATIONAL BOARD SUBGROUP INSPECTION**

## **MINUTES**

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Meeting of January 12<sup>th</sup>, 2016  
Corpus Christi, TX

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The National Board of Boiler & Pressure Vessel Inspectors  
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**1. Call to Order**

The meeting was called to order at 8:05 am on January 12, 2016 by Mr. Jim Getter.

**2. Introduction of Members and Visitors**

The attendees are identified on Attendance sign in sheet (**Attachment Pages 1-2**). With the attached attendance listing, a quorum was established.

**3. Announcements**

J. Getter (Chairman) and J. Metzmaier (Secretary) presented announcements for the remainder of the week.

**4. Adoption of the Agenda**

Motion was made to adopt the agenda as presented. Motion was unanimously approved.

**5. Approval of the Minutes of July 14, 2015 Meeting**

A motion was made to approve the subgroup on Inspection minutes from July 14, 2015. The motion was unanimously approved.

**6. Old Business**

**i. Interpretations**

There are no interpretations assigned to SG Inspection.

**ii. Action Items**

<b>Item Number: NB07-0910</b>	<b>NBIC Location: Part 2, S6</b>	<b>Attachment Pages 3-5</b>
<b>General Description:</b> Review of Part 2 S6 for completeness and accuracy		
<b>Subgroup:</b> Inspection		
<b>Task Group:</b> S. Staniszewski (PM), G. McRae, J. Riley, C. Withers		
<b>January 2016 meeting action:</b>		
S. Staniszewski & C. Withers presented a document showing changed to S6. After much discussion, a motion was made to approve the document as submitted. The motion was unanimously approved.		

<b>Item Number: NB13-1002</b>	<b>NBIC Location: Part 2</b>	<b>www.nbicshare.org</b>
<b>General Description:</b> Review inspection requirements against ASME B31.1 Power Piping code		
<b>Subgroup:</b> Inspection		
<b>Task Group:</b> M. Schwartzwalder (PM), J. Frey, V. Newton, M. Mooney, D. Canonico, M. Horbaczewski, B. Dobbins		
<b>January 2016 meeting action:</b>		
M. Schwartzwalder & M. Horbaczewski gave a progress report. They discussed with the SG the options of adding something in to the NBIC Part 2 with regards to B31.1 or just reference to B31.1. Task group will meet and have something to present in July 2016.		
-Remove B. Dobbins from the Task Group.		
-Add C. Withers to the Task Group.		

<b>Item Number: NB13-1301</b>	<b>NBIC Location: Part 2</b>	<b>www.nbicshare.org</b>
<b>General Description:</b> Review finite element analysis methods and how they pertain to inspection		
<b>Subgroup:</b> Inspection		
<b>Task Group:</b> J. Riley (PM), S. Staniszewski, M. Schwartzwalder, M. Mooney, R. Pate		
<b>January 2016 meeting action:</b> Due to insufficient response from the letter ballot sent to Main Committee in July 2015, no action was taken at the Subgroup level.		

<b>Item Number: NB13-1302</b>	<b>NBIC Location: Part 2</b>	<b>Attachment Pages 6-7</b>
<b>General Description:</b> Review inspection requirements for cryogenic pressure vessels		
<b>Subgroup:</b> Inspection		
<b>Task Group:</b> J. Riley (PM), A. Renaldo, R. Dobbins, R. Bartley, R. Pate, D. Graf		
<b>January 2016 meeting action:</b> C. Withers presented a revised document based on letter ballot comments from the Main committee. A motion was made to approve this document. The motion was unanimously approved.		

<b>Item Number: NB13-1303</b>	<b>NBIC Location: Part 2</b>	<b>Attachment Pages 8-10</b>
<b>General Description:</b> Review inspection requirements for biomass fired boilers		
<b>Subgroup:</b> Inspection		
<b>Task Group:</b> M. Mooney (PM), M. Horbaczewski, D. Canonico, J. Safarz		
<b>January 2016 meeting action:</b> M. Mooney discussed D. Cook's disapproval comments from the Main Committee letter ballot of July 2015. The Subgroup made necessary changes to address these comments, and a motion was made to approve the document as revised. The motion was unanimously approved.		

<b>Item Number: NB13-1406</b>	<b>NBIC Location: Part 2, S1</b>	<b>www.nbicshare.org</b>
<b>General Description:</b> Add requirements for inspection of superheater units		
<b>Subgroup:</b> Inspection		
<b>Task Group:</b> R. Stone (PM)		
<b>January 2016 meeting action:</b> B. Ferrell discussed the item with the SG on Inspection. A task group was assigned. P. Welch (PM), M. Mooney, R. Stone.		

<b>Item Number: NB13-1409</b>	<b>NBIC Location: Part 2, S1</b>	<b>www.nbicshare.org</b>
<b>General Description:</b> Address method for analyzing bulges created by overheating in stayed boiler surfaces		
<b>Subgroup:</b> Inspection		
<b>Task Group:</b> M. Mooney (PM), R. Stone		
<b>January 2016 meeting action:</b>		
B. Ferrell discussed the item with the SG on Inspection. A task group was assigned. P. Welch (PM), M. Mooney, R. Stone.		

<b>Item Number: NB13-1701</b>	<b>NBIC Location: Part 2, 2.3.6.6</b>	<b>www.nbicshare.org</b>
<b>General Description:</b> Review inspection requirements for wire wound pressure vessels		
<b>Subgroup:</b> Inspection		
<b>Task Group:</b> R. Dobbins (PM), M. Mooney, J. Riley, V. Scarcella, G. Galanes		
<b>January 2016 meeting action:</b>		
M. Horbaczewski gave a progress report of no progress. -New Project Manager assigned: M. Horbaczewski.		

<b>Item Number: NB14-0901</b>	<b>NBIC Location: Part 2</b>	<b>No Attachment</b>
<b>General Description:</b> Review inspection requirements for pressure vessels designed for high pressures		
<b>Subgroup:</b> Inspection		
<b>Task Group:</b> M. Horbaczewski (PM), M. Schwartzwalder, D. Graf, G. Scribner		
<b>January 2016 meeting action:</b>		
M. Horbaczewski gave a progress report of no progress.		

<b>Item Number: NB14-1001</b>	<b>NBIC Location: Part 2, 5.2.1</b>	<b>Attachment Pages 11-14</b>
<b>General Description:</b> Add requirements to address replacement of duplicate nameplates where the original nameplate is intact and attached to an inner vessel, where it may or may not be visible		
<b>Subgroup:</b> Inspection		
<b>Task Group:</b> J. Larson (PM), P. Welch, D. Ford, R. Pate, J. Getter, G. McRae, M. Horbaczewski, B. Petersen		
<b>January 2016 meeting action:</b>		
Action Item NB15-0204 & NB15-2105 have been combined with the documents this Action Item. C. Withers presented changes to the wording and to the Form NB-136. A motion was made to accept these changes. The motion was passed unanimously.		

<b>Item Number: NB14-1101</b>	<b>NBIC Location: Part 2</b>	<b>www.nbicshare.org</b>
<b>General Description:</b> Diaphragm weld inspection.		
<b>Subgroup:</b> Inspection		
<b>Task Group:</b> P. Welch (PM), D. Graf, R. Stone		
<b>January 2016 meeting action:</b> B. Ferrell discussed the item with the SG on Inspection. A task group was assigned. P. Welch (PM), M. Mooney, R. Stone.		

<b>Item Number: NB14-1701</b>	<b>NBIC Location: Part 2</b>	<b>No Attachment</b>
<b>General Description:</b> Add diagrams for local thin areas (LTAs) for low pressure propane tanks		
<b>Subgroup:</b> Inspection		
<b>Task Group:</b> G. McRae (PM), T Vandini, J. Getter, M. Mooney		
<b>January 2016 meeting action:</b> A motion was made to close this item with no action due to no one on the committee knowing the history/origin behind this item. The motion was unanimously approved.		

<b>Item Number: NB14-1801</b>	<b>NBIC Location: Part 2</b>	<b>www.nbicshare.org</b>
<b>General Description:</b> Ferrules		
<b>Subgroup:</b> Inspection		
<b>Task Group:</b> R. Stone (PM)		
<b>January 2016 meeting action:</b> B. Ferrell discussed the item with the SG on Inspection. A task group was assigned. P. Welch (PM), M. Mooney, R. Stone.		

<b>Item Number: NB14-1802</b>	<b>NBIC Location: Part 2</b>	<b>www.nbicshare.org</b>
<b>General Description:</b> Riveted staybolt head dimensions and Figure S1.2.2-c		
<b>Subgroup:</b> Inspection		
<b>Task Group:</b> R. Stone (PM)		
<b>January 2016 meeting action:</b> B. Ferrell discussed the item with the SG on Inspection. A task group was assigned. P. Welch (PM), M. Mooney, R. Stone.		

<b>Item Number: NB15-0201</b>	<b>NBIC Location: Part 2</b>	<b>www.nbicshare.org</b>
<b>General Description:</b> Provide consistent language in all areas of the NBIC affected by the closure of NB13-0701		
<b>Subgroup:</b> Inspection		
<b>Task Group:</b> J. Riley (PM), M. Mooney, T. Vandini, M. Clark, G. McRae		
<b>January 2016 meeting action:</b> V. Newton gave a progress report of no progress.		

<b>Item Number: NB15-0204</b>	<b>NBIC Location: Part 2, 5.5.2</b>	<b>Attachment Pages 11-14</b>
<b>General Description:</b> Investigate Part 2, 5.5.2 and 5.5.3 for consistency with requirements about replacement of stamping during inservice inspection generated from NB12-1801		
<b>Subgroup:</b> Inspection		
<b>Task Group:</b> B. Petersen (PM), P. Welch, C. Withers		
<b>January 2016 meeting action:</b> This item was combined with NB14-1001 & NB15-2105 and closed with the unanimous vote of approval on NB14-1001.		

<b>Item Number: NB15-0504</b>	<b>NBIC Location: Part 2, S10</b>	<b>www.nbicshare.org</b>
<b>General Description:</b> Result of PR15-0701, PR15-0702 and PR15-0703, clarify what the National Board Commissioned Inspector's specific duties are when inspecting high pressure composite vessels		
<b>Subgroup:</b> Inspection		
<b>Task Group:</b> E. Brantly (PM), M. Mooney, M. Horbaczewski, E. Brantly, V. Newton		
<b>January 2016 meeting action:</b> E. Brantley gave a progress report which included comments from outside source regarding the 3 Public Review Comments. Mr. Brantley should have something to present to the subgroup in July 2016.		

<b>Item Number: NB15-0801</b>	<b>NBIC Location: Part 2, CO2 Supplement</b>	<b>Attachment Pages 15-19</b>
<b>General Description:</b> Result of PR15-0602, clarify which inspection requirements for CO2 pressure vessels apply specifically to the National Board Commissioned Inspector		
<b>Subgroup:</b> Inspection		
<b>Task Group:</b> M. Mooney (PM), P. Welch, V. Newton, T. Barker		
<b>January 2016 meeting action:</b> M. Mooney presented changes to the document originally approved by the Subcommittee in July 2015. These changes were made due to concerns voiced by an AIA. The changes were reviewed and a motion was made to approve the document. The motion was unanimously approved.		

<b>Item Number: NB15-0901</b>	<b>NBIC Location: Part 2, CO2 Supplement</b>	<b>Attachment Pages 15-19</b>
<p><b>General Description:</b> Result of PR15-0205, PR15-0206, PR15-0207, PR15-0208, PR15-0209, PR15-0210, PR15-0211 and PR15-0402, address issues in the CO2 supplement regarding requirements for inspection of equipment that are outside of the scope of insurance policies that insurance companies issue</p> <p><b>Subgroup:</b> Inspection  <b>Task Group:</b> M. Mooney (PM), P. Welch, V. Newton, T. Barker, E. Brantly</p> <p><b>January 2016 meeting action:</b>  A motion was made to close this item with no action due to NB15-0801 being approved.</p>		

<b>Item Number: NB15-1002</b>	<b>NBIC Location: Part 2</b>	<b>Attachment Page 20</b>
<p><b>General Description:</b> Update “stamp” vs. “certification” language to maintain consistency with ASME code</p> <p><b>Subgroup:</b> Inspection  <b>Task Group:</b> D. Graf (PM), P. Welch</p> <p><b>January 2016 meeting action:</b>  C. Withers proposed new wording to add into the introduction of the NBIC to cover the issue of this action item. A motion was made to approve the wording. The motion was unanimously approved.</p>		

<b>Item Number: NB15-2103</b>	<b>NBIC Location: Part 2, S7.8.6 &amp; S7.9</b>	<b>Attachment Page 21-22</b>
<p><b>General Description:</b> Update Part 2, S7 for consistency with new requirements in Part 2, S9</p> <p><b>Subgroup:</b> Inspection  <b>Task Group:</b> D. Buechel, T. Vandini</p> <p><b>January 2016 meeting action:</b>  T. Vandini presented a document showing proposed changes. A motion was made to approve these changes. The motion was unanimously approved.</p>		

<b>Item Number: NB15-2304</b>	<b>NBIC Location: Part 2</b>	<b>Attachment Pages 23-28</b>
<p><b>General Description:</b> Review NBIC footnotes; remove footnotes that are code language or definitions</p> <p><b>Subgroup:</b> Inspection  <b>Task Group:</b> M. Horbaczewski, C. Withers</p> <p><b>January 2016 meeting action:</b>  C. Withers proposed changes for the footnotes throughout Part 2. A motion was made to approve the changes. The motion was unanimously approved.</p>		

## 7. New Business

<b>Item Number: NB15-2105</b>	<b>NBIC Location: Part 2, 5.2.1</b>	<b>Attachment Pages 11-14</b>
<b>General Description:</b> Under 5.2.1 b) the last line "The completed Form NB-136....") is left over from the 2013. The reporting is all covered under 5.2.3. Reporting now so the sentence in 5.2.1 b) should be removed.		
<b>Subgroup:</b> Inspection		
<b>Task Group:</b> None assigned		
<b>January 2016 meeting action:</b> This item was combined with NB14-1001 & NB15-0204 and closed with the unanimous vote of approval on NB14-1001.		

<b>Item Number: NB15-2701</b>	<b>NBIC Location: Part 2</b>	<b>www.nbicshare.org</b>
<b>General Description:</b> Create quick reference guide for inspection activity		
<b>Subgroup:</b> Inspection		
<b>Task Group:</b> None assigned		
<b>January 2016 meeting action:</b> Motion was made to close this item with no action. The motion was unanimously approved.		

## 8. Future Meetings

July 18-21, 2016 – Columbus, Ohio

January 9-12, 2017 – San Diego, California

## 9. Adjournment

A motion was made and unanimously approved to adjourn the meeting at 4:10pm.

Respectfully submitted,

Jodi Metzmaier

Secretary – Part 2, Inspection



## SG Inspection Attendance Sheet -1/12/16

Name	Company	Phone Number	Email	Signature	Attend Rec.?	Guest?
Jim Getter	Worthington Industries	(614) 840-3087	<a href="mailto:jim.getter@worthingtonindustries.com">jim.getter@worthingtonindustries.com</a>		Y	N
Mike Schwartzwalder	AEP	(614) 581-6456	<a href="mailto:mschwartzwalder@aep.com">mschwartzwalder@aep.com</a>		Y	N
Jodi Metzmaier	National Board	(614) 888-8320	<a href="mailto:jmetzmaier@nationalboard.org">jmetzmaier@nationalboard.org</a>		Y	N
Timothy Barker	Fm Global Factory Mutual	360 901 3790 (781) 255-4784	<a href="mailto:timothy.barker@fmglobal.com">timothy.barker@fmglobal.com</a>		Y	N
Ernest Brantley	XL Insurance	(337) 842-7044	<a href="mailto:ernest.brantley@bpcllca.com">ernest.brantley@bpcllca.com</a>		Y	N
Domenic Canonico	Canonico & Assoc.	(423) 886-1008	<a href="mailto:canonicod@ebpfi.com">canonicod@ebpfi.com</a>			
David Ford	U.S. DOT	(202) 366-4545	<a href="mailto:david.ford@dot.gov">david.ford@dot.gov</a>			
Darrell Graf	Air Products & Chemicals	(601) 799-2889	<a href="mailto:grafdr@airproducts.com">grafdr@airproducts.com</a>		N	Ø
Mark Horbaczewski	Diamond Technical Services	<del>815 634 2727</del> <del>(630) 733-8102</del>	<a href="mailto:mhorbaczewski@diamondtechnicalservices.com">mhorbaczewski@diamondtechnicalservices.com</a>		Y	N
Greg McRae	Trinity Industries	(214) 589-8559	<a href="mailto:greg.mcrae@trin.net">greg.mcrae@trin.net</a>		Y	N
Mark Mooney	Liberty Mutual	697 7218 (781) 891-8900	<a href="mailto:mark.mooney@libertymutual.com">mark.mooney@libertymutual.com</a>		Y	N
Venus Newton	XL Boiler & Property Insurance	(770) 614-3111	<a href="mailto:venus.newton@boilerproperty.com">venus.newton@boilerproperty.com</a>		N	N
Jim Riley	Phillips 66	(510) 245-5895	<a href="mailto:jim.riley@p66.com">jim.riley@p66.com</a>			
Jason Safarz	CEC Combustion Safety	(216) 749-2992	<a href="mailto:jsafarz@combustionsafety.com">jsafarz@combustionsafety.com</a>			
Stanley Staniszewski	U.S. DOT	(202) 366-4545	<a href="mailto:stanley.staniszewski@dot.gov">stanley.staniszewski@dot.gov</a>		Y	
Thomas Vandini	Quality Steel Corporation	(419) 334-2664	<a href="mailto:tvandini@propanetank.com">tvandini@propanetank.com</a>		Y	N
Paul Welch	Arise	(678) 446-5290	<a href="mailto:paul.welch@ariseinc.com">paul.welch@ariseinc.com</a>		Y	N
DAVE BUECHEL	MUNICH RE HSB	412-885-8120	<a href="mailto:DAVID_BUECHEL@HSB.COM">DAVID_BUECHEL@HSB.COM</a>		Y	N
BRYCE HART	ZURICH	610 223 3560	<a href="mailto:BRYCE.HART@ZURICHNA.COM">BRYCE.HART@ZURICHNA.COM</a>		Y	N
ADAM RENALDO	PRAXAIR	716 510 3613	<a href="mailto:ADAM_RENALDO@PRAXAIR.COM">ADAM_RENALDO@PRAXAIR.COM</a>		Y	N
Bonnie Petersen	Marquip Ward United	715-820-2668	<a href="mailto:Bonnie.Petersen@bwpapersystems.com">Bonnie.Petersen@bwpapersystems.com</a>		Y	N



**SUPPLEMENT 6****CONTINUED SERVICE AND INSPECTION OF DOT TRANSPORT TANKS****S6.1 SCOPE**

This supplement provides rules for continued service inspections of transport tanks, i.e., cargo tanks, rail tanks, portable tanks, and ton tanks that transport dangerous goods as required in the Code of Federal Regulations, Title 49, Parts 100 through 185, and the United Nations Recommendations for Transport of Dangerous Goods-Model Regulations. This supplement, where applicable, shall be used in conjunction with other applicable Parts of the *National Board Inspection Code* (NBIC) and ASME Section XII, Rules for Construction and Continued Service of Transport Tanks, Transport Tanks, of the ASME Boiler and Pressure Vessel Code.

**S6.2 TERMINOLOGY**

- a) The terminology used in this supplement in some cases may be in conflict with terms and definitions normally used ~~in for inspection, the~~ repair, and alteration of pressure-retaining items. Considering these differences, this supplement ~~in the Definition section~~includes a definition section, has incorporated listing definitions and terms specified in CFR 49, Parts 100 through 185.
- b) When conflicts are identified between this part and the regulations of the ~~competent~~Competent authority ~~Authority~~ regarding the examination, inspection, testing, repair, and maintenance for the continued qualification of transport tanks, the regulations of the Competent Authority take precedence.
- c) Rules for repairs, alterations, and modifications of transport tanks are provided in NBIC Part 3, *Repairs and Alterations*, Supplement 6.

**S6.3 ADMINISTRATION**

- a) The Competent Authority's requirements describe the frequency, scope, type of inspection (internal, external, or both), type of examination (nondestructive, spark test, etc.), and the documentation requirements for the inspection.
- b) For transport tanks under the Jurisdiction of the Department of Transportation, the Registered Inspector shall have a thorough knowledge of the Code of Federal Regulations, Title 49, Parts 100 through 185.

**S6.4 INSPECTION**

This section ~~will~~es establish the appropriate methods to be used for continued service inspections. ~~Inspections for repairs and modifications of~~Specific requirements for inspections of repairs, alterations, and modifications to transport tanks ~~is~~are located in NBIC Part 3, *Repairs and Alterations*, Supplement 6.

**S6.4.1 SCOPE**

This section describes the duties, qualifications, and responsibilities of the Registered Inspector, and the scope of inspection activities permitted.

**S6.4.2 GENERAL REQUIREMENTS FOR INSPECTORS**

- a) The Inspector shall be a Registered Inspector and qualified as a National Board ~~recognized~~Commissioned Inspector, ~~i.e.~~, Authorized Inspector (AI), Qualified Inspector (QI), or a Certified

Individual (CI), ~~as applicable, to perform continued service inspections or a Registered Inspector (RI).~~ The Registered Inspector is a position established by CFR 49 Parts 100 through 185 for Continued Service Inspections. This ~~individual's-Inspector's~~ duties and responsibilities are ~~subject to DOT and not ASME QAI-1, identified in this supplement and subject to DOT regulations, not ASME QAI-1.~~

- b) For continued service inspections, the owner or user's **designated and qualified** Registered Inspector can be used to perform inspections and testing in accordance with the Code of Federal Regulations, Title 49, Parts 100 through 185, Transportation, **as stated below**.
- c) Inspections for continued service of transport tanks shall be performed by the type of inspector identified below for the specific class of vessel as defined in the applicable Modal Appendices of ASME Section XII and as required by the Competent Authority. Inspectors shall be a Registered Inspector and meet the following additional requirements:
- 1) For Class 1 vessels, Inspectors shall be designated as an Authorized Inspector regularly employed by an ASME accredited Authorized Inspection Agency (AIA). The AIA, supervisors, and inspectors shall meet the qualifications and duties as required in the latest edition of ASME QAI-1 Qualifications for Authorized Inspection.
  - 2) For Class 2 vessels, Inspectors shall be designated as Qualified Inspectors regularly employed by an ASME accredited Qualified Inspection Organization (QIO). The QIO, supervisors, and inspectors shall meet the qualifications and duties as required in the latest edition of ASME QAI-1, Qualifications for Authorized Inspection.
  - 3) For Class 3 vessels, Inspectors shall be designated a Certified Individual (CI) employed full or part time by an ASME Section VIII or Section XII Certificate Holder or contractor to the Certificate Holder manufacturing DOT Transport Tanks. The CI shall meet the qualifications and duties as required in the latest edition of ASME QAI-1, Qualification for Authorized Inspection.
  - 4) Authorized Inspection Agencies may provide inspection services for Class 2 and Class 3 vessels. Qualified Inspection Organizations may provide inspection services for Class 3 vessels.
- b)5) Users may perform continued service inspections including repairs and alterations if the user possesses a valid Owner-User Inspection Organization (OUIO) Certificate of Authorization (NB-371) issued by the National Board of Boiler and Pressure Vessel Inspectors, inspectors have a current and valid NB Commission, and are employed by the OUIO.

### **S6.4.3 REGISTRATION OF INSPECTORS**

Each ~~Registered~~ Inspector performing duties and responsibilities for continued service inspections or ~~inspections for repairs and modifications~~ as specified in this section and 49 CFR Part 180 is required to meet the qualification requirements of NBIC Part 2, S6.4.4, ~~S6.4.6 and through~~ S6.4.7, ~~as applicable to be registered with DOT.~~

### **S6.4.4 QUALIFICATIONS OF INSPECTORS**

Registered Inspector (RI) means a person registered with the US Department of Transportation (DOT) in accordance with Subpart F of Part 107 of 49 CFR who has the knowledge and ability to determine whether a ~~cargo-Transport~~ tank conforms to the applicable DOT specification. A Registered Inspector may or may not be an employee of the approved facility. In addition, Registered Inspector means a person who meets, at a minimum, any one of the following:

- a) Has an engineering degree and one year of work experience;

- b) Has an associate degree in engineering and two years of work experience;
- c) Has a high school diploma or GED and three years of work experience; and
- d) Has at least three years of experience in performing the duties of a Registered Inspector by September 1, 1991, and was registered with the DOT by December 31, 1995.

#### **S6.4.5 CODES OF CONSTRUCTION**

- a) The Registered Inspector is responsible to ensure that all repairs, alterations or modifications (including re-rating) are performed in accordance with the original code of construction of the transport tank.
- b) For repairs, alterations, or modifications, the original code of construction for DOT vessels shall be either ASME Section VIII Division I or Section XII.

#### **S6.4.6 INSPECTOR DUTIES FOR CONTINUED SERVICE INSPECTIONS**

- a) Inspectors performing Continued Service Inspections required by the Code of Federal Regulations (CFR), Title 49, Part 180 shall be a Registered Inspector. The Inspector shall satisfy the following requirements:
  - 1) Has satisfied DOT requirements as a Registered Inspector;
  - 2) Has successfully completed the National Board's web-based training program for Registered Inspectors and been issued a National Board certificate of completion;
  - 3) Has received authorization from DOT as a Registered Inspector; and
  - 4) Has been registered by DOT for the classification(s) of Transport Tanks to be inspected.
- b) Inspectors performing Continued Service Inspections meeting the requirements of NBIC Part 2, S6.13 (Cargo Tanks), S6.14 (Portable Tanks), or S6.15 (Ton Tanks), and 49 CFR, Part 180 shall perform all inspections and tests required by this Section and any additional requirements, as applicable in 49CFR Part 180. The Inspections and tests shall be documented as follows:
  - 1) All inspections and tests shall be conducted, as applicable, in accordance with NBIC Part 2, S6.13, S6.14, and S6.15;
  - 2) All inspections and tests shall be documented in an Inspection Report as required by NBIC Part 2, S6.5;
  - 3) All inspection and test reports shall be maintained by the owner, user, or shipper of the transport tank in accordance with NBIC Part 2, S6.5;
  - 4) All inspection and test reports shall be available for review by an authorized representative of the Department of Transportation; and
- c) The requirements for inspections are provided for each classification of transport tanks as specified in NBIC Part 2, S6.4.6.1, Cargo Tanks, S6.4.6.2, Portable Tanks and S6.4.6.3, Ton Tanks.

##### **S6.4.6.1 INSPECTOR DUTIES FOR CONTINUED SERVICE INSPECTION OF CARGO TANKS**

- a) Cargo tanks constructed in accordance with a DOT Specification that are required to be tested or inspected can not be used for transportation until the required test or inspection has been successfully completed.

NB 13-1302

### 2.3.6.9 Inspection of Static Vacuum Insulated Cryogenic Vessels

- a) This section covers the periodic inspection and testing of static vacuum insulated cryogenic pressure vessels used in the storage of cryogenic liquefied gases. Owner-users should inspect static cryogenic vacuum-insulated storage tanks to ensure that the equipment is in safe ~~serviceable-operable~~ condition.
- b) A static vacuum insulated cryogenic vessel is a vessel that is thermally insulated for use with one or more cryogenic ~~fluids~~liquid, consisting of: 1) an inner vessel holding the cryogenic ~~fluid~~liquid, 2) an outer jacket that serves as an air tight enclosure which supports the inner vessel, holds the insulation and enables the vacuum to be established, and 3) the associated piping system.
- c) Check that the following conditions or safeguards are adequate prior to doing a periodic external inspection of the vessel:
  - 1) Surface water drainage is directed away from the location of installation. Proximity of storage tank to sewer inlets shall comply with local fire jurisdictional requirements.
  - 2) Protective measures are in place for the vessels and components from mechanical impact damage (such as barricades, safe set-back distances, poles and bars).
  - 3) Any fire proofing for external supports is in acceptable condition. Any gas from pressure relief devices or vents is discharged to a safe point of discharge. Relief valve discharges are not aimed directly at external supports or the outer jacket wall.
  - 4) There is sufficient ventilation to avoid the formation of explosive gas-air mixtures or an oxygen deficient/enriched atmosphere.
- d) A periodic external visual inspection of the vessel and equipment should be made to ensure that the vacuum between the inner vessel and outer jacket has not been compromised. If the vessel has lost vacuum, the owner-user of the cryogenic storage vessel shall immediately investigate the cause. Any loss of vacuum should be investigated as this could affect the integrity of the vessel and support system. If the cause is due to an internal pipe failure as evidenced by vapor escaping from the vacuum relief device, the pressure should be immediately reduced to atmospheric pressure followed by emptying of all of the cryogenic liquid in a safe manner.
- e) External visual inspections are possible at all accessible parts of the vessel and piping. The following inspections should be included as part of the periodic external visual inspection.
  - 1) A functional check of essential and critical valves and their operability.
  - 2) Leak tests under operating conditions of the vessel and piping.
  - 3) Assessing if there have been any significant changes in the operational conditions of the installation and its surroundings.
  - 4) Check that there is no excessive out-of-roundness or deformation of the outer jacket
  - 5) Check all nozzles for corrosion or damage.
  - 6) Check the vessel supports for structural damage.
  - 7) Check that any attachments to the outer jacket are not damaged or affecting the vessel condition.
  - 8) Verification of periodic testing and repair (or replacement) of the pressure relief device(s)
  - 9) Check that the pressure relief device(s) are not continually venting. PRD's may vent periodically under normal circumstances but should be reported for maintenance testing and repair if venting continually.
  - 10) Checking the condition of the outer jacket, piping and accessories

- 11) Check for abnormal frosting on outer jacket surface. Under normal usage, frost and ice will develop around pipes, valves, controls and vaporizers
- 12) Inspect the outer skin of the outer jacket for any new or abnormal signs of excessive frosting.
- 13) Confirm that the duplicate ASME nameplate is attached to the outer jacket, tank leg or other permanent location affixed to the vessel.

## Update Current Glossary

**Cryogenic Liquid** — ~~A refrigerated liquefied gas having a boiling point colder than -90°C (-130°F) at 101.3 kPa (14.7 psia) absolute. Products stored at or below -238 °F (-150°C)~~

## 1.2- Administration

Add to end of Part 2, Section 1.2

Unless otherwise specifically required by the jurisdiction, the duties of the Inspector do not include inspection to other standards and requirements (e.g., environmental, construction, electrical, operational, undefined industry standards, etc) for which other regulatory agencies have authority and responsibility to oversee.

### Proposed New Supplement for Part 2

#### Inspection of Biomass Fired Boiler Installations (Section 6, Supplement 9)

##### S9.1 - Scope

- a) This supplement provides ~~rules-guidelines~~ for continued inspection of biomass fired boilers and the additional equipment utilized in these installations. In this context Biomass is intended to mean various types of ~~wood~~ wastes, or ~~wood~~ byproducts. organic fiber organic fiber
- b) Many of the requirements of the earlier Sections of Part 2 are common to all boiler installations irrespective of the fuel being fired; therefore this supplement will address the differences that occur when solid fuels, such as Biomass, are being used. Thus the primary thrust of this section will be directed toward the inspection of the fuel handling and distribution systems, and the impact these systems may have on the pressure vessel itself.

##### S9.2 – Assessment of Installation

- a) A general assessment of the complete installation shall be undertaken, including ~~in terms of observable results of operating and maintenance practices. Indicators include the general boiler room cleanliness, for example significant quantities of fuel particles (dust) should not be apparent in the boiler room,~~ including rafters and beams. The assessment includes the general cleanliness of the boiler room,
- b) The combustion air inlet shall be free of any debris or dust particle build up, and where moveable louvered intakes exist, the actuating mechanisms shall be clean and operate freely. Corrective action is required when non-compliance is noted.
- c) The flue gas venting system shall be checked for tightness, with no observable signs of leakage. Corrective action is required if leakage is noted.



- d) The intakes of the various fans or blowers shall be free of fuel particle build up or signs of other debris. Corrective action in terms of cleaning is required when discrepancies are noted.
- e) The fuel metering equipment and the fuel transportation system shall be free from signs of particulate or dust leakage. Corrective action in terms of cleaning and repair work is required as necessary.
- f) Electrical equipment and controls shall be properly protected from the ingress of dust, by ensuring that all cover plates are properly installed and all panel doors are intact, operable and closed.
- g) Verify that all guards for rotating equipment (shafts, bearings, drives) are correctly installed and fan inlet screens are in place.
- h) On the boiler, generally check for signs of potential problems, including but not limited to;
- Water leaks
  - Ash Leaks
  - Condition of insulation and lagging.
  - Casing leaks or cracks
  - ~~Check a~~ All safety valves for bypass and ensure the inspection plugs are capped and the drain lines are piped away from traffic areas. to a safe point of discharge
  - Missing or misaligned pieces or parts ~~(ie e.g., twisted, misaligned or bound up buck stays, missing linkage bolting).~~
  - Condition of support systems
  - Provision of "Danger" or "Caution" signs
  - Excess vibration
  - Excess noise.
- i) Verify that the Owner/User has established function test, inspection, requirements, maintenance and testing of all controls and safety devices in accordance with the manufacturer's recommendations. Verify that these activities are conducted at assigned intervals in accordance with written procedures, non-conformances which impact continued safe operation of the boiler are corrected and the results are properly documented. These activities shall be at a frequency recommended by the manufacturer, or frequency required by the jurisdiction. Where no frequencies are recommended, or prescribed, the activity should be conducted at least annually

remove "and" and create new bullet points for each.

do not have a

to a safe point of discharge

### S9.3 – Boiler Room Cleanliness

- a) While boiler room cleanliness is of primary importance in all boiler rooms it is of particular importance in biomass fired boiler rooms. Biomass can contain fine particulate, which if allowed to leak from the transportation system into the surrounding boiler room, will eventually be drawn into fans, resulting in the possibility of combustion air systems becoming plugged.
- b) Boiler rooms containing quantities of fine dusts are susceptible to fire or explosion, again emphasizing the need for high standards of cleanliness.

#### **S9.4 – Emission Control Requirements**

- a) Emission control is dependent upon the fuel being fired and the emission requirements prevailing at the location of the boiler installation. As such they are a part of the initial design and installation process, and apart from ensuring that they are kept in top working condition, so that emission requirements are not violated; there is little that can be done from the inspector's point of view.
- b) When Continuous Emissions Monitors (CEM's) are in use, they should be demonstrated to be functioning properly and have a current calibration sticker.
- c) Delta-P pressure gauges which measure the pressure drop across the various elements of the emission control system should all be functioning correctly.
- d) There should be no sign of erosion caused by entrained particulate matter, in any part of the breaching, ductwork, stack or the individual emission control elements.
- e) On systems in which the emissions control system incorporates a baghouse, appropriate fire detection and suppression systems shall be incorporated and functioning properly.

## PART 2, SECTION 5 INSPECTION — STAMPING, DOCUMENTATION, AND FORMS

### 5.1 SCOPE

This section provides guidelines and requirements for stamping and documentation (forms) for inservice inspections of PRIs. This section also describes evaluation of inspection results and assessment methodologies.

### 5.2 REPLACEMENT OF STAMPING OR NAMEPLATE

#### 5.2.1 AUTHORIZATION

- a) When the stamping on a pressure-retaining item becomes indistinct or the nameplate is lost, illegible, or detached, but traceability to the original pressure-retaining item is still possible, the Inspector shall instruct the owner or user to have the nameplate or stamped data replaced. All re-stamping shall be done in accordance with the original code of construction, except as modified herein. Requests for permission to re-stamp data or replace nameplates shall be made to the Jurisdiction in which the nameplate or stamping is reapplied. Application must shall be made on the *Replacement of Stamped Data Form*, NB-136 (see NBIC Part 2, 5.3.2). Proof of traceability to the original nameplate or stamping and other such data, as is available, shall be furnished with the request. Permission from the Jurisdiction is not required for the reattachment of nameplates that are partially attached. When traceability cannot be established, the Jurisdiction shall be contacted for approval prior to replacing a nameplate or re-applying a stamping. The completed Form NB-136 (see 5.3.2) shall be submitted to the National Board. The owner or user shall retain all documentation provided for traceability with the completed form NB-136 for as long as the pressure-retaining item is in their ownership or use. If the pressure-retaining item is sold, Form NB-136 along with the supporting documentation shall be provided to the new owner. The manufacturer of the pressure-retaining item, if available, should shall be contacted prior to replacing a nameplate or stamped data in order to verify applicable code requirements.
- b) When there is no Jurisdiction, the documentation used for traceability shall be accepted-verified and the replacement of the nameplate or stamped data shall be authorized and witnessed by a National Board Commissioned Inspector. The completed Form NB-136 shall be submitted to the National Board.

#### 5.2.2 REPLACEMENT OF NAMEPLATE OR STAMPED DATA

- a) The re-stamping or replacement of data shall be witnessed by a National Board Commissioned Inspector.
- b) The re-stamping or replacement of a code symbol stamp shall be performed only as permitted by the governing code of construction.
- c) Replacement nameplates or stamped data shall be clearly marked “replacement.”

#### 5.2.3 REPORTING

The completed Form NB-136 with a facsimile of the replacement stamping or nameplate as applied and appropriate signatures shall be filed with the Jurisdiction, if applicable, and the National Board by the owner or user (if required) and the National Board or by the “R” Stamp Holder if work was performed, bearing a facsimile of the replacement stamping or nameplate, as applied, and shall also bear the signature of the “R” Stamp holder that performed the replacement and the National Board Commissioned Inspector who authorized and witnessed the replacement.

#### **5.2.4 REPLACEMENT OF DUPLICATE NAMEPLATES**

Replacement or re-attachment of duplicate nameplates is exempt from meeting the requirements above provided the information on the nameplate is identical to the original data existing on the pressure-retaining item. The duplicate nameplate shall be marked duplicate. The jurisdiction where the pressure-retaining item is located and the original manufacturer of the item should shall be contacted for additional guidance and direction. When the Code symbol stamp cannot be applied, Form NB-136 shall be completed, signed by a National Board Commissioned Inspector, retained and a copy submitted to the National Board by the owner or user as described in 5.2.1 a).

### **5.3 NATIONAL BOARD INSPECTION FORMS**

#### **5.3.1 SCOPE**

~~The following f~~Forms specified in 5.3.2 may be used for documenting specific requirements as indicated on the top of each form.

**Note:** Jurisdictions may have adopted other forms for the same purpose and may not accept these forms.

**REPLACEMENT OF STAMPED DATA FORM, NB-136**  
 in accordance with provisions of the *National Board Inspection Code*

Submitted to:

\_\_\_\_\_  
(name of jurisdiction)

\_\_\_\_\_  
(address)

\_\_\_\_\_  
(telephone no.)

Submitted by:

\_\_\_\_\_  
(name of owner, user, or certificate holder)

\_\_\_\_\_  
(address)

\_\_\_\_\_  
(telephone no.)

1. Manufactured by \_\_\_\_\_  
(name and address)
2. Manufactured for \_\_\_\_\_  
(name and address)
3. Location of installation \_\_\_\_\_  
(address)
4. Date installed \_\_\_\_\_
5. Previously installed at \_\_\_\_\_
6. Manufacturer's Data Report attached  No  Yes
7. Item registered with National Board  No  Yes, NB Number \_\_\_\_\_
8. Item identification \_\_\_\_\_ Year built \_\_\_\_\_  
 Type \_\_\_\_\_ Dimensions \_\_\_\_\_  
 Mfg. serial no. \_\_\_\_\_ Jurisdiction no. \_\_\_\_\_  
 MAWP \_\_\_\_\_ psi Safety relief valve set at \_\_\_\_\_ psi
9. Complete the reverse side of this report with a true facsimile of the legible portion of the nameplate.
10. If nameplate is lost or illegible, traceability documentation, verified by the Inspector shall be attached to this report.

11. I request authorization to replace the stamped data and/or nameplate on the above described pressure-retaining item in accordance with the rules of the *National Board Inspection Code* (NBIC).  
"R" Certificate Holder/Owner User  
~~"R" Certificate Holder's Name:~~ \_\_\_\_\_ Number \_\_\_\_\_  
 Signature \_\_\_\_\_ Date \_\_\_\_\_  
 Verification of Traceability \_\_\_\_\_ NB Commission \_\_\_\_\_  
(Name of inspector)

12. Authorization is granted to replace the stamped data or to replace the nameplate of the above described pressure-retaining item.  
 Signature \_\_\_\_\_ Date \_\_\_\_\_  
(chief inspector or authorized representative)  
 Jurisdiction (if available) or NB Commission no. \_\_\_\_\_

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NB14-1001, NB15-0204 & NB15-2105

The following is a true facsimile of the legible portion of the item's original nameplate (if available). Please print. Where possible, also attach a rubbing or picture of the nameplate.

[Empty box for original nameplate facsimile]

The following is a true facsimile of the item's replacement stamping or nameplate.

[Empty box for replacement stamping or nameplate facsimile]

I certify that to the best of my knowledge and belief, the statements in this report are correct, and that the replacement information, data, and identification numbers are correct and in accordance with the requirements of the National Board Inspection Code.

**"R" Certificate Holder/Owner User**

~~"R" Certificate Holder~~ \_\_\_\_\_ Number \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_  
(authorized representative)

Witnessed by \_\_\_\_\_ Employer \_\_\_\_\_  
(name of inspector)

Signature \_\_\_\_\_ Date \_\_\_\_\_ NB Commission \_\_\_\_\_  
(inspector)

"FOR COMMITTEE USE ONLY" SECTION 5

NB15-0801 &amp; NB15-0901

(PM) Mooney, Newton, Welch, Barker

Commenter Name: Kenneth A. Stoller - American Insurance Association (AIA)

Commenter Address: 2101 L Street NW, Suite 400  
Washington, DC 20037

Commenter Phone: 202-828-7167

Commenter Fax: 202-495-7866

Commenter Email: kstoller@aiadc.org

Section/Subsection Referenced: Supplement 10, Inspection of Liquid Carbon Dioxide Storage Vessels

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

AIA believes that several aspects of the proposed requirements are either undefined or otherwise beyond the normal scope and training of National Board Commissioned Inspectors. Imposing these requirements on Special Inspectors may also place them in the untenable position of assuming liability beyond the limits of the insurance policies under which they perform inspections. Items of concern include the failure to define the terms "sufficient clearance" (S10.2b), "safely supported" (S10.2d), "guarded (S10.2f); and "permanent" (S10.3a). We recommend either defining or deleting these terms. Furthermore, Commissioned Inspectors are not qualified to (i) determine whether a CO2 detector is set to alarm at any particular concentration (S10.5); (ii) verify the posting of warning signs and determine the setpoint of any alarms (S10.6); or (iii) determine the length of safety relief/vent lines or verify that the materials selected for valves, piping, tubing, hoses and fittings used in the LCDSV system meet certain requirements. We recommend deleting these sections.

## SUPPLEMENT 10 INSPECTION OF LIQUID CARBON DIOXIDE STORAGE VESSELS

### S10.1 SCOPE

This supplement provides ~~requirements- guidelines~~ for ~~individuals and organizations when inspecting the inspection of~~ Liquid Carbon Dioxide Storage Vessels (LCDSVs), fill boxes, fill lines and pressure relief discharge/vent circuits used for carbonated beverage systems, swimming pool pH control systems and other fill in place systems storing liquid CO<sub>2</sub>.

### S10.2 GENERAL REQUIREMENTS (ENCLOSED AND UNENCLOSED AREAS)

The ~~Inspector inspection shall should~~ verify that LCDSVs ~~are~~:

- a) ~~are~~ not ~~be~~ located within 10 feet (3050 mm) of elevators, unprotected platform ledges or other areas where falling would result in dropping distances exceeding half the container height;
- b) ~~are~~ installed with ~~sufficient~~ clearance ~~to satisfactorily allow for~~ filling, operation, maintenance, inspection and replacement ~~of the vessel parts or appurtenances~~;
- c) ~~are~~ not ~~installed-located~~ on roofs;
- d) ~~are safely-adequately~~ supported ~~as to prevent the vessel from tipping or falling, and to meet seismic requirements as required by design as needed~~;
- e) ~~are~~ not located within 36 in. (915 mm) of electrical panels; and
- f) located outdoors in areas in the vicinity of vehicular traffic are ~~protected with barriers designed to guarded to~~ prevent accidental impact by vehicles.

**S10.3 ENCLOSED AREA LCDSV INSTALLATIONS**

The ~~Inspector inspection shall~~ verify that:

- a) ~~Permanent~~ LCDSV installations that are not periodically removed with remote fill connections:
  - 1) Are equipped with a gas detection system installed in accordance with ~~NBIC Part 2, paragraph~~ S10.5 of this supplement;
  - 2) Have signage posted in accordance with ~~NBIC Part 2, paragraph~~ S10.6 of this supplement; and
  - 3) Are equipped with fill boxes, fill lines and safety relief/vent valve circuits installed in accordance with ~~NBIC Part 2, S10.4, paragraph~~ S10.4 of this supplement.
- b) Portable LCDSV installations with no permanent remote fill connection:  
Warning: LCDSVs shall not be filled indoors or in enclosed areas under any circumstances. Tanks must always be moved to the outside to an unenclosed, free airflow area for filling.
  - 1) Are equipped with a gas detection system installed in accordance with paragraph S10.5 of this supplement ~~NBIC Part 2, S10.5~~;
  - 2) Have signage posted in accordance with paragraph S10.6 of this supplement ~~NBIC Part 2, S10.6~~.
  - 3) Have a safety relief/vent valve circuit connected at all times except when the tank is being removed for filling. Connections may be fitted with quick disconnect fittings meeting the requirements of paragraph S10.4 of this supplement ~~NBIC Part 2, S10.4~~.
  - 4) Are provided with a pathway that provides a smooth rolling surface to the outdoor, unenclosed fill area. There shall not be any stairs or other than minimal inclines in the pathway.

**S10.4 FILL BOX LOCATION /SAFETY RELIEF/VENT VALVE CIRCUIT TERMINATION**

The ~~Inspector inspection shall~~ verify that fill boxes and/or vent valve terminations are installed above grade, outdoors in an unenclosed, free airflow area, and that the fill connection is located so not to impede means of egress or the operation of sidewalk cellar entrance doors, including during the delivery process and that they are:

- a) At least three (3) feet (915 mm) from any door or operable windows;\*
- b) At least three (3) feet (915 mm) above grade;\*
- c) Not located within ten (10) feet (3050 mm) from side to side at the same level or below, from any air intakes;\*
- d) Not located within ten (10) feet (3050 mm) from stair wells that go below grade.\*

\* Note: Many systems installed prior to 1/1/2014 do not meet the above requirements and the local Jurisdiction should be consulted for guidance.

**S10.5 GAS DETECTION SYSTEMS**

Rooms or areas where carbon dioxide storage vessel(s) are located indoors or in enclosed or below grade outdoor locations shall be provided with a gas detection and alarm system for general area monitoring that is capable of detecting and notifying building occupants of a CO<sub>2</sub> gas release. Alarms will be designed to activate a low level pre-alarm at 1.5% concentration of CO<sub>2</sub> and a full high alarm at 3% concentration of CO<sub>2</sub> which is the NIOSH & ACGIH 15 minute Short Term Exposure Limit for CO<sub>2</sub>. These systems are not designed for employee personal exposure monitoring. Gas detection systems shall be installed and tested in accordance with manufactures installation instructions and the following requirements:

- a) The ~~Inspector inspection shall~~ verify that the gas detection system and audible alarm is operational and tested in accordance with manufacturer's guidelines.



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b) The ~~Inspector inspection shall~~ should verify that audible alarms are placed at the entrance(s) to the room or area where the carbon dioxide storage vessel and/ or fill box is located to notify anyone who might try to enter the area of a potential problem.

### S10.6 SIGNAGE

The ~~Inspector inspection shall~~ should verify that warning signs are posted at the entrance to the building, room, enclosure, or enclosed area where the container is located. The warning sign shall be at least 8 in (200mm) wide and 6 in. (150mm) high. The wording shall be concise and easy to read and the upper portion of the sign must be orange as shown in figure NBIC Part 2, Figure S10.6. The size of the lettering must be as large as possible for the intended viewing distance and in accordance with jurisdictional requirements. When no jurisdictional requirements exist, the minimum letter height shall be in accordance with NEMA American National Standard for Environmental and Facility Safety Signs (ANSI Z535.2). The warning signs shall be as shown in figure S10.6.

Figure S10.6

Additional instructional signage shall be posted outside of the area where the container is located and such signage shall contain at minimum the following information:

- a) Carbon dioxide monitors for general area monitoring (not employee personal exposure monitoring) are provided in this area. These monitors are set to alarm at 5,000 ppm(1.5% concentration) for the low level alarm and at 30,000 ppm (3% concentration) for high level alarm.
- b) Low Level Alarm (5,000 ppm) – 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.
- c) High Level Alarm (30,000 ppm) – 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 CO<sub>2</sub> is reduced below the high alarm limit.

### S10.7 VALVES, PIPING, TUBING AND FITTINGS

a) Materials – The ~~Inspector inspection should shall~~ verify that the materials selected for valves, piping, tubing, hoses and fittings used in the LCDSV system meet following requirements:

- 1) Components shall be rated for the operational temperatures and pressures encountered in the applicable circuit of the system.
- 2) All valves and fittings used on the LCDSV shall be rated for the maximum allowable working pressure(MAWP) stamped on the tank.
- 3) 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 MAWP of the piping, hose or tubing.

b) Relief Valves – The ~~Inspector shall~~ inspection should verify that 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 NBIC Part 2, Tables S10-a and S10-b.

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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 manufacturer to prevent over pressurization of the vessel.

c) Isolation Valves – The ~~Inspector shall~~inspection should verify that 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:

- 1) Isolation valves shall be located on the tank or at an accessible point as near to the storage tank a possible.
- 2) All valves shall be designed or marked to indicate clearly whether they are open or closed.
- 3) All valves shall be capable of being locked or tagged in the closed position for servicing.
- 4) Gas supply and liquid CO<sub>2</sub> fill valves shall be clearly marked for easy identification.

d) Safety Relief/Vent Lines – The ~~Inspector~~inspection, where possible, ~~shall~~should verify the integrity of the pressure relief/vent line from the pressure relief valve to outside vent line discharge fitting. All connections shall be securely fastened to the LCDSV. The minimum size and length of the lines shall be in accordance with NBIC Part 2, Tables S2 10-a and S2 10-b. Fittings or other connections may result in a localized reduction in diameter have been factored into the lengths given by the NBIC Part 2, Tables S2 10-a and S2 10-b.

**Table S10-a Minimum LCDSV System Pressure Relief/Vent Line Requirements (Metallic)**

Tank Size

(Pounds)

Fire Flow Rate

Requirements

(Pounds per Minute)

Maximum Length of

3/8 inch ID Nominal

Metallic Tube Allowed

Maximum Length of 1/2

inch ID Nominal

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 S10-b Minimum LCDSV System Pressure Relief/Vent Line Requirements (Plastic/Polymer)**

Tank Size

(Pounds)

Fire Flow Rate

Requirements (Pounds

per Minute)

Maximum Length of

3/8 inch ID

Plastic/Polymer

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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 S10-a Metric Minimum LCDSV System Pressure Relief /Vent Line Requirements  
 (Metallic)**

Tank Size  
 (Kilograms)  
 Fire Flow Rate  
 Requirements  
 (Kilograms per Minute)  
 Maximum Length of  
 10mm ID Nominal  
 Metallic Tube Allowed  
 Maximum Length of  
 13mm ID Nominal  
 Metallic Tube Allowed  
 Less than 227 1.8 maximum 24 m 30.5 m  
 227-340 1.75 maximum 17 m 30.5 m  
 340-454 2.50 maximum 5.5 m 30.5 m

**Table S10-b Metric Minimum LCDSV System Pressure Relief/Vent Line Requirements  
 (Plastic/Polymer)**

Tank size  
 (kg)  
 Fire Flow Rate (kg per  
 Minute)  
 Maximum Length of 10  
 mm ID Nominal Metallic  
 Tube Allowed  
 Maximum Length of 10  
 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  
 Note: Due to the design of the LCDSV the discharge line may be smaller in diameter than the pressure  
 relief valve outlet size but shall not be smaller than that shown in tables NBIC Part 2, S10-a and S10-b.

NB15-1001; **NB15-1002**; NB15-1003; NB15-1004

Include the following text in the Introduction under the heading “Stamping”

ASME Code “Stamping” referenced throughout the NBIC includes the ASME Boiler and Pressure Vessel Code Symbol Stamps used for conformity assessment prior to the 2010 edition/2011 addendum and the equivalent ASME Certification Mark with Designator required to meet the later editions of the ASME Boiler and Pressure Vessel Code Sections. When other construction codes or standards are utilized for repairs or alterations, stamping shall mean the identification symbol stamp required by that code or standard to indicate conformity assessment.

NFPA 58 contains the following language regarding conversion of tanks for LP-Gas fuel service from ammonia service:

5.2.1.5 Except for containers used in cargo tank vehicle service, ASME containers of 3000 gal (11.4 m<sup>3</sup>) water capacity or less used to store anhydrous ammonia shall not be converted to LP-Gas fuel service.

Therefore, the following are proposed edits (**in bold red**) to S9.4 and S7.8.6 address NB15-2103. No edits required to S7.9:

#### **S9.4 SOME EXAMPLES FOR CHANGE OF SERVICE**

Table S9.4 lists examples of what constitutes a change in service and some factors to consider. Note: This list is not all inclusive. There may be other service changes not mentioned.

The listing of "Factors to Consider" is also not all inclusive. There may be other elements that can influence the safe and reliable operation of the pressure retaining item.

The owner shall check with the Jurisdiction where the pressure retaining item is to operate in the new environment, and review local building codes, laws, and regulations for additional requirements or prohibitions against a change of service.

#### **TABLE S9.4**

#### **EXAMPLES OF CHANGE OF SERVICE CONDITIONS**

##### **Change Some Factors to Consider**

LP Gas to Ammonia

- PWHT of Vessel During Construction Wet-fluorescent magnetic particle testing (WFMT) on all internal surfaces
- Internal access of vessel is necessary, may need to install manhole
- NFPA 58 should be consulted

Ammonia to LP gas

- NFPA-58 **5.2** should be consulted **for restrictions.** ~~Refer i.e. restriction on maximum volume~~
- Wet-fluorescent magnetic particle testing (WFMT) on all internal surfaces
- Internal access of vessel is necessary, may need to install manhole
- Also see, NBIC Part 2, 2.3.6.4, **S7.8.6, S7.9**

LP gas service: from above ground to underground

- Requires alterations (additional

#### **S7.8.6 ANHYDROUS AMMONIA SERVICE**

**ASME containers of 3000 gal (11.4 m<sup>3</sup>) water capacity or less used to store anhydrous ammonia, except for containers used in cargo tank vehicle service, shall not be converted to LP-Gas service.**

**Cargo tank containers less than 3000 gal (11.4 m<sup>3</sup>) water capacity to be converted from ammonia to LP-gas service shall be wet-fluorescent magnetic particle tested (WFMT) on all internal surfaces (see NBIC Part 2, 2.3.6.4). Containers that have been previously used in anhydrous ammonia service shall not be converted to LPG service.**

**Any blue** coloring of the brass valves ~~indicates is one indication~~ that the container has been in anhydrous ammonia service.

**S7.9 ASME LPG CONTAINERS LESS THAN 2000 GALLONS BEING REFURBISHED BY A COMMERCIAL SOURCE.**

Commercially refurbished containers are used containers that are temporarily taken out of service for repair and or renewal and sent to a company which specializes in this type of work. Because the history of some of these containers is unknown, special attention shall be given to inspection and repair before returning any of these containers back to service. ASME LPG containers less than 2,000 gal. (7,570 l) may be refurbished subject to the following conditions:

- a) A complete external inspection shall be completed under the guidelines of this supplement. If any defects are found, as defined in S7.8.1 through S7.8.5, the defect shall be repaired under NBIC Part 3, Repairs and Alterations, by qualified personnel or permanently removed from service;
- b) Containers **of this size** that have been previously used in anhydrous ammonia service shall not be converted to LPG service. See NBIC Part 2, S7.8.6;

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parentheses. In Part 2, Supplement 6 and Part 3, Supplement 6 regarding DOT Transport Tanks, the metric units are shown first with the U.S. customary units shown in parentheses.

U.S. customary units or metric units may be used with this edition of the NBIC, but one system of units shall be used consistently throughout a repair or alteration of pressure-retaining items. It is the responsibility of National Board accredited repair organizations to ensure the appropriate units are used consistently throughout all phases of work. This includes materials, design, procedures, testing, documentation, and stamping. The NBIC policy for metrication is outlined in each part of the NBIC.

## ACCREDITATION PROGRAMS

The National Board administers and accredits three specific repair programs<sup>1</sup> as shown below:

- “R”.....Repairs and Alterations to Pressure-Retaining Items
- “VR”.....Repairs to Pressure Relief Valves
- “NR”.....Repair and Replacement Activities for Nuclear Items

Part 3, Repairs and Alterations, of the NBIC describes the administrative requirements for the accreditation of these repair organizations.

The National Board also administers and accredits four specific inspection agency programs as shown below:

### New Construction

Criteria for Acceptance of Authorized Inspection Agencies for New Construction (NB-360)

### Inservice

Qualifications and Duties for Authorized Inspection Agencies (AIAs) Performing Inservice Inspection Activities and Qualifications for Inspectors of Boilers and Pressure Vessels (NB-369)

### Owner-User

Accreditation of Owner-User Inspection Organizations (OUIO) (NB-371) Owners or users may be accredited for both a repair and inspection program provided the requirements for each accreditation program are met.

### Federal Government

Qualifications and Duties for Federal Inspection Agencies Performing Inservice Inspection Activities (FIAs) (NB-390)

These programs can be viewed on the National Board Website at [www.nationalboard.org](http://www.nationalboard.org). For questions or further information regarding these programs contact the National Board by phone at (614) 888-8320 or by fax at (614) 847-1828

## CERTIFICATES OF AUTHORIZATION FOR ACCREDITATION PROGRAMS

Any organization seeking an accredited program may apply to the National Board to obtain a Certificate of Authorization for the requested scope of activities. A confidential review shall be conducted to evaluate the organization's quality system. Upon completion of the evaluation, a recommendation will be made to the National Board regarding issuance of a Certificate of Authorization.

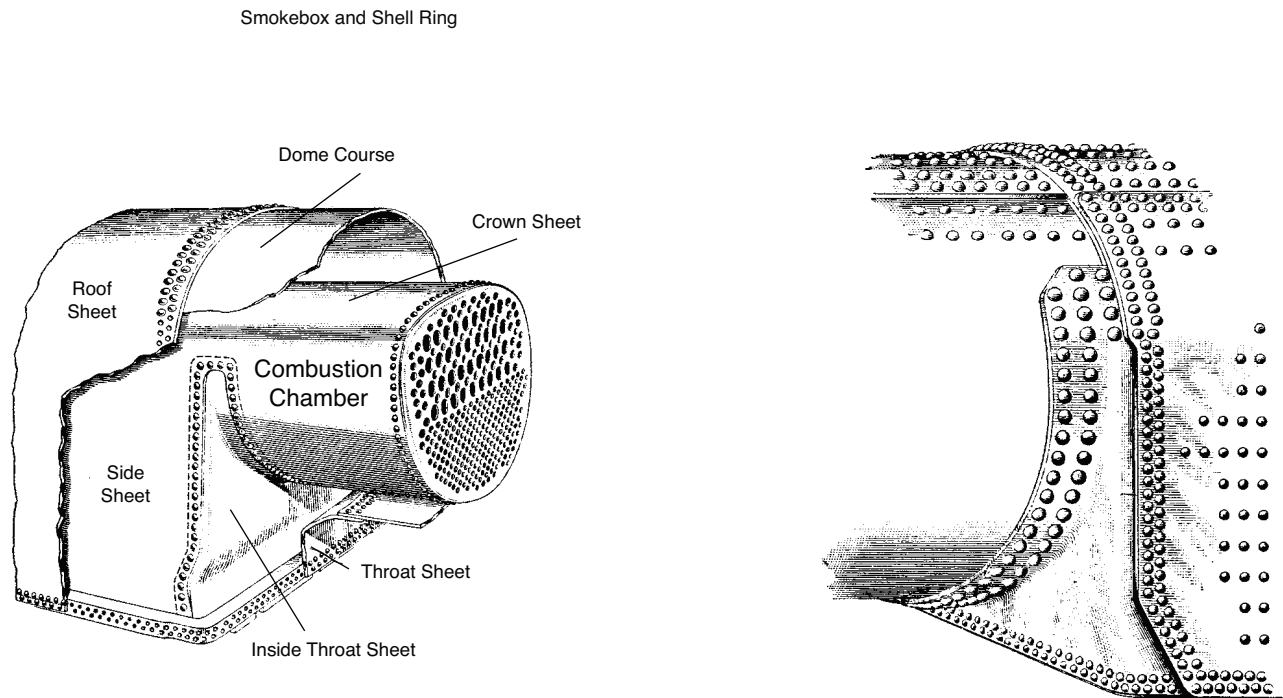
Certificate of Authorization scope, issuance, and revisions for National Board accreditation programs are specified in the applicable National Board procedures. When the quality system requirements of the appropriate accreditation program have been met, a Certificate of Authorization and appropriate National Board symbol stamp shall be issued.

Some

<sup>1</sup> ~~Caution, some~~ Jurisdictions may independently administer a program of authorization for organizations to perform repairs and alterations within that Jurisdiction.

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**FIGURE S1.1-b**  
ARRANGEMENT OF FIREBOX SHEETS (STAYBOLTS DELETED FOR CLARITY)



## S1.2 SPECIAL JURISDICTIONAL REQUIREMENTS

Many Jurisdictions have special requirements for locomotive boilers. Such requirements shall be considered in addition to those in this supplement.

## S1.3 FEDERAL RAILROAD ADMINISTRATION (FRA)

The FRA rules for steam locomotive boilers are published in the *Code of Federal Regulations* (CFR) 49CFR Part 230, dated November 17, 1999.<sup>2</sup> All locomotives under FRA Jurisdiction are documented on FRA Form 4 as defined in 49CFR Part 230. This document is the formal documentation of the steam locomotive boiler and is required to be completed prior to the boiler being placed in service. This document shall be used as the data report for the boiler, applicable to all repairs and alterations performed. National Board "R" Certificate Holders shall document their repairs and/or alterations on National Board Forms R-1 or R-2. These reports shall be distributed to the owner or user of the boiler, who is required to incorporate them into the FRA Form 19, which becomes an attachment to the FRA Form 4. The design margin for all such repairs or alterations shall not be less than four, based on ultimate tensile strength of the material.

## S1.4 LOCOMOTIVE FIRETUBE BOILER INSPECTION

### S1.4.1 INSPECTION METHODS

- a) Plate thickness and depth of corrosion may be determined by use of the ultrasonic thickness testing process.

<sup>2</sup> ~~Steam locomotive inspection and maintenance standards, which are now codified at 49CFR Part 230, may be obtained at the FRA Website.~~



acceptable for use. The use of malleable iron class 150 is not recommended. Forged threaded fittings per ASME B16.11 classes 2,000-6,000 are acceptable for use;

- d) The blowdown line shall be piped to a safe point of discharge during the time the boiler is operating;
- e) Piping shall be properly supported;
- f) Valves shall be used in the manner for which they were designed, and shall be used within the specified pressure-temperature ratings. Valves shall be rated at or above the pressure setting of the boiler safety valve, denoted by the general or primary pressure class identification on the valve body and/or by the initials "WSP" or "S" to indicate working steam pressure or steam rating. Valves in cold-water service may be designated by the initials "WOG" to indicate water, oil, or gas rating and/or by the pressure class identification on the valve body; and
- g) The boiler shall be equipped with two means of supplying feedwater while the boiler is under pressure.

### S2.9.1 PIPING, FITTINGS, AND VALVE REPLACEMENTS

The installation date should be stamped or stenciled on the replaced boiler piping. Alternatively, the installation date may be documented in permanent boiler records, such as the operator log book.

### S2.10 MAXIMUM ALLOWABLE WORKING PRESSURE (MAWP)

The MAWP of a boiler shall be determined by computing the strength of each boiler component. The computed strength of the weakest component using the factor of safety allowed by these rules shall determine the MAWP.

**Note:** The rules of ASME Section I 1971 Edition, Part "PR" and "PFT" may be used for determining specific requirements of design and construction of boilers and parts fabricated by riveting.<sup>3</sup>

#### S2.10.1 STRENGTH

- a) In calculating the MAWP, when the tensile strength of the steel or wrought iron is known, that value shall be used. When the tensile strength of the steel or wrought iron is not known, the values to be used are 55,000 psi (379 MPa) for steel and 45,000 psi (310 MPa) for wrought iron. Original steel stamp marks, original material certifications, or current laboratory tests are acceptable sources for verification of tensile strength. Catalogs and advertising literature are not acceptable sources for tensile strength values.
- b) In computing the ultimate strength of rivets in shear, the following values shall be used:
 

1) Iron rivets in single shear	38,000 psi (262 MPa)
2) Iron rivets in double shear	76,000 psi (524 MPa)
3) Steel rivets in single shear	44,000 psi (303 MPa)
4) Steel rivets in double shear	88,000 psi (607 MPa)
- c) The resistance to crushing of mild steel shall be taken as 95,000 psi (655 MPa) unless otherwise known.
- d)  $S = TS/FS$ . See definitions of nomenclature in NBIC Part 2, S2.10.6.

<sup>3</sup> ~~Copies of ASME Section I 1971 Edition Part "PR" and "PFT" referenced section may be obtained by contacting the National Board of Boiler and Pressure Vessel Inspectors, 1055 Crupper Ave., Columbus, OH 43229.~~

- e) Remove gage glass and valves, and inspect these connections for lime deposits and clean if necessary. This should be done once a year; more often if conditions warrant it.
- f) After inspection, replace glass (clean if necessary). Also inspect gage glass sealing washers and replace if necessary.
- g) During cold weather, the historical boiler should be moved into a heated area and the boiler allowed to warm up in the air for several days until it is the same temperature as the air.
- h) The initial fire-up should be done slowly to allow even heating of the boiler.
- i) Before movement, the cylinder(s) should be warmed up by allowing a small quantity of steam to blow through them and out the cylinder cocks and exhaust passage(s). This is necessary to reduce the stress in the casting from thermal expansion of the metal.
- j) Steam should be discharged through the cylinder cocks for several minutes to aid removal of any solvent, debris, or rust that may have formed in the steam pipes, cylinder, valve chest, and dry pipe.
- k) All appliances should be tested under steam pressure before the historical boiler is moved or put under load.

## S2.14 SAFETY PROCEDURES<sup>2</sup>

This chapter of text covers procedures in certain situations or emergencies that may occur.

### S2.14.1 EXPERIENCE

- a) Reading check lists and procedures can be of some value to get you thinking about what you are doing, but nothing can replace the experience gained by working beside conscientious and knowledgeable engineers. Ask questions, observe, read, listen, study, and think.
- b) Safe operations depend upon thorough attention to detailed routines. Having procedures thought out, planned, and practiced before they are needed could minimize accidents and improve public safety. Know your abilities as well as the limitations of the machine that you are operating. In most cases knowing and keeping your machine in top operating condition can prevent most emergency situations from occurring. However, sometimes problems or situations beyond your control do occur. In any situation the first rule to remember is to keep a cool head. Haste and panic can never solve any emergency.
- c) Don't be afraid to ask for help or advice. A lot of shows and public demonstrations have a designated individual in the area to ensure safe operation and assistance should a problem arise.

### S2.14.2 STOPPING ENGINE IN AN EMERGENCY

- a) Know how to stop the engine suddenly. For example, if someone or something runs out in front of the engine or some problem happens with whatever it is belted up to:
  - 1) Close throttle.
  - 2) Reverse valve quadrant position.
  - 3) Open throttle for a moment (this will quickly stop your engine).
  - 4) Close throttle.

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**SUPPLEMENT 5****INSPECTION OF YANKEE DRYERS (ROTATING CAST-IRON PRESSURE VESSELS) WITH FINISHED SHELL OUTER SURFACES****S5.1 SCOPE**

- a) This supplement describes guidelines for the inservice inspection of a Yankee dryer. A Yankee dryer is a rotating steam-pressurized cylindrical vessel commonly used in the paper industry, and is made of cast iron, finished to a high surface quality, and characterized by a center shaft connecting the heads.
- b) Yankee dryers are primarily used in the production of tissue-type paper products. When used to produce machine-glazed (MG) paper, the dryer is termed an MG cylinder. A wet paper web is pressed onto the finished dryer surface using one or two pressure (pressing) rolls. Paper is dried through a combination of mechanical dewatering by the pressure roll(s); thermal drying by the pressurized Yankee dryer; and a steam-heated or fuel-fired hood. After drying, the paper web is removed from the dryer.
- c) The dryer is typically manufactured in a range of outside diameters from 8 to 23 ft. (2.4 m to 7 m), widths from 8 to 28 ft. (2.4 m to 8.5 m), pressurized and heated with steam up to 160 psi (1,100 kPa), and rotated at speeds up to 7,000 ft./min (2,135 m/min). Typical pressure roll loads against the Yankee dryer are up to 600 pounds per linear inch (105 kN/m). A thermal load results from the drying process due to difference in temperature between internal and external shell surfaces. The dryer has an internal system to remove steam and condensate. These vessels can weigh up to 220 tons (200 tonnes).
- d) The typical Yankee dryer is an assembly of several large castings. The shell is normally a gray iron casting, in accordance with ASME designation SA-278. Shells internally may be smooth bore or ribbed. Heads, center shafts, and journals may be gray cast iron, ductile cast iron, or steel.

**S5.2 ASSESSMENT OF INSTALLATION**

- a) The Inspector verifies that the owner or user is properly controlling the operating conditions of the dryer. The Inspector does this by reviewing the owner's comprehensive assessments of the complete installation, operating environment, maintenance, and operating history.
- b) The dryer is subjected to a variety of loads over its life. Some of the loads exist individually, while others are combined. Consideration of all the loads that can exist on a Yankee dryer is required to determine the maximum allowable operating parameters. There are four loads that combine during normal operation to create the maximum operating stresses, usually on the outside surface of the shell at the axial center line. These are:
  - 1) Pressure load due to internal steam pressure;
  - 2) Inertial load due to dryer rotation;
  - 3) Thermal gradient load due to the drying of the web; and
  - 4) Pressure roll load (line or nip load)<sup>3</sup> due to pressing the wet web onto the dryer.
- c) Steam pressure, inertial, and thermal gradient loads impose steady-state stresses. These stresses typically change when the dryer shell thickness (effective thickness for ribbed dryers) is reduced to restore a paper-making surface, the grade of tissue is changed or speed of the dryer is changed.

<sup>3</sup> 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).

- e) Permitted materials can be either an ASME, SA material, or an ASTM Material permitted by NBIC Part 2, Table S6.15.1-b;
- f) DOT Specification 106A ton tanks shall only use forged-welded heads, convex to pressure. The forged-welded heads shall be torispherical with an inside radius not greater than the inside diameter of the shell. The heads shall be one piece, hot formed in one heat so as to provide a straight flange at least 100 mm (4 inches) long. The heads must have a snug fit into the shell;
- g) DOT Specification 110A ton tanks shall only use fusion-welded heads formed concave to pressure. The fusion-welded heads shall be an ellipsoid of 2:1 ratio and shall be of one piece, hot formed in one heat so as to provide a straight flange at least 38 mm (1-1/2 inches) long;
- h) All longitudinal welded joints on DOT Specification 106A and DOT Specification 110A ton tanks shall be a fusion weld. DOT Specification 106A ton tank head-to-shell attachments shall be a forged-welded joint.<sup>6</sup> DOT Specification 110A ton tank head-to-shell attachments shall be a fusion weld;
- i) Postweld heat treatment is required after welding for all DOT Specification 106A and Specification 110A ton tanks;
- j) DOT Specification 106A and DOT Specification 110A ton tanks shall be of such a design as to afford maximum protection to any fitting or attachment to the head, including loading and unloading valves. The protection housing<sup>6</sup> shall not project beyond the end of the ton tanks and shall be securely fastened to the tank head;
- k) If applicable, siphon pipes and their couplings on the inside of the ton tank's head and lugs on the outside of the tank head for attaching valve protection housing shall be fusion welded prior to performing postweld heat treatment;
- l) DOT Specification 106A and DOT Specification 110A ton tanks are required to be equipped with one or more approved types of pressure relief devices. The devices shall be made out of metal and the pressure relief devices shall not be subject to rapid deterioration by the lading. The device's inlet fitting to the tank shall be a screw-type fitting and installed or attached directly into the ton tank's head or attached to the head by other approved methods. For thread connections, the following shall apply:
- 1) The threaded connections for all openings shall be in compliance with the National Gas Taper Threads (NGT);
  - 2) Pressure relief devices shall be set for start-to-discharge, and rupture discs shall burst at a pressure not exceeding the pressure identified in NBIC Part 2, Table S6.15.1-a; and
- m) Fusible plugs, if used, shall be required to relieve the pressure from the tank at a temperature not exceeding 79°C (175°F) and shall be vapor tight at a temperature not exceeding 54°C (130°F).

<sup>6</sup> ~~The forged-welded joint shall be thoroughly hammered or rolled to ensure a sound weld.~~