



<b>Boilers and Pressure Vessels Safety Program</b>	Ref. No.: BPV-13-01	Rev. No.: 2 (Marked as ◇)
<b>CODE ADOPTION DOCUMENT AMENDMENT</b>	Date: January 21, 2013	Date: January 31, 2014

**IN THE MATTER OF:**

**THE TECHNICAL STANDARDS AND SAFETY ACT, 2000, S.O. 2000, c. 16 (the "Act")**

**- and -**

**ONTARIO REGULATION 223/01**

**(Codes and Standards Adopted by Reference) made under the Act**

**- and -**

**ONTARIO REGULATION 220/01 (Boilers and Pressure Vessels) made under the Act**

**Subject:** Amendments to the 2001 Boilers and Pressure Vessels Code Adoption Document

**Sent to:** Boilers and Pressure Vessels Advisory Council and posted on the Technical Standards and Safety Authority website

---

The Director of Ontario Regulation 220/01 (Boilers and Pressure Vessels) pursuant to section 2 of Ontario Regulation 223/01 (Codes and Standards Adopted by Reference) hereby provides notice that the Boilers and Pressure Vessels Code Adoption Document dated June 1, 2001 is amended as follows:

## **TABLE OF CONTENTS**

The Table of Contents is amended from the 2001 Boilers and Pressure Vessels Code Adoption Document by revoking and replacing with the following:

### **FOREWORD**

1.0 CSA B51

2.0 CSA B52

3.0 CSA N285.0

4.0 Periodic Inspection

5.0 Ice Rinks for Hockey, Skating or Curling

6.0 Welder/Welding Operator and Brazier/Brazing Operator Authorization

7.0 Applications for an Ontario Certificate of Competency

8.0 Effective Date

*Additional notes to CAD Amendment:*

*All sections are revised except section 5.0 which is reprinted with no changes from the 2001 Boilers and Pressure Vessels Code Adoption Document and sections 7.0 and 8.0 are new additions.*

## FOREWORD

The Foreword is amended from the 2001 Boilers and Pressure Vessels Code Adoption Document by revoking and replacing with the following:

The *Boilers & Pressure Vessels Regulation* made under the *Technical Standards and Safety Act* adopts this *Code Adoption Document* for the Province of Ontario.

This *Code Adoption Document* establishes essential requirements and minimum standards for the: design; fabrication; installation; repair; alteration; inspection; testing; operation; and use of boilers, pressure vessels, fittings and piping.

Definitions in the *Code Adoption Document* have the same meaning as in the *Boilers & Pressure Vessels Regulation* made under the *Technical Standards and Safety Act* unless otherwise stated.

In the event of conflict between a provision of this *Document* and adopted codes and standards, this *Document* shall prevail.

Enquiries regarding this *Code Adoption Document* may be addressed to:

Technical Standards and Safety Authority  
Boilers and Pressure Vessels Safety Program  
3300 Bloor Street West  
14th Floor, Centre Tower  
Toronto, Ontario  
M8X 2X4

Email: [customerservices@tssa.org](mailto:customerservices@tssa.org)

*Additional notes to CAD Amendment:*

*The Foreword has minor editorial updates.*

## 1.0 CSA B51

Section 1.0 of the 2001 Boilers and Pressure Vessels Code Adoption Document is amended by revoking and replacing with the following:

*Additional notes to CAD Amendment:*

*Section 1.0 supersedes Director's Order Reference Number BPV-08-01 Rev. 0 issued May 1, 2008.*

- 1.1** CSA B51-09 *Boiler, Pressure Vessel and Pressure Piping Code* (including Update Number 1 – March 2009), as amended from time to time, is hereby adopted with the following exceptions, additions or positions on requirements in the following referenced clauses from the Standard:

**NOTE:** Reference Clauses as given in CSA B51.

## CSA B51 - PART 1

1.2 Clause 2, Reference Publications, is revoked and the following substituted:

### **CSA (Canadian Standards Association)**

CSA B52-05 (R2009) *Mechanical Refrigeration Code*, (including B52S1-09 *Supplement No. 1 to B52-05, Mechanical refrigeration code - March 2009*)

CAN/CSA-ISO 9000-05 (R2010)

*Quality Management Systems - Fundamentals and Vocabulary (Adopted ISO 9000:2005, third edition, 2005-09-15)*

CAN/CSA-Z180.1-00 (R2010)

*Compressed Breathing Air and Systems*

Z299 series of Standards

CAN3-Z299.1-85 (R2007)

*Quality Assurance Program -Category 1*

CAN3-Z299.2-85 (R2007)

*Quality Assurance Program – Category 2*

CAN3-Z299.3-85 (R2007)

*Quality Assurance Program – Category 3*

CAN/CSA-Z7396.1-09

*Medical Gas Pipeline Systems - Part 1:- Pipelines for Medical Gases and Vacuum*

Z662-11

*Oil and Gas Pipelines Systems*

### **ANSI (American National Standards Institute)**

ANSI/ASQ Z1.4-2008

*Sampling Procedures and Tables for Inspection by Attributes*

CGA G-2.1

*American National Standard Safety Requirements for the Storage and Handling of Anhydrous of Ammonia (ANSI K61.1-1999)*

### **API (American Petroleum Institute)**

ANSI/API 530 (2008)

*Calculation of Heater Tube Thickness in Petroleum Refineries, Sixth Edition (ISO 13704:2007, Identical)*

### **ASME (American Society of Mechanical Engineers)**

Sections I, II, III, IV, V, VIII, IX, X and XI of the *Boiler and Pressure Vessel Code* (2010)

Note: Use of ASME Section VIII Division 1, Appendix M for pressure vessel installations requires TSSA approval.

*Additional notes to CAD Amendment:*

- a. ASME editions listed are current at the time of issuance of this CAD Amendment however new construction requires that the current mandatory edition of the ASME code is used for at the time of design and construction of an item.
- b. Use of ASME Section VIII, Division 1, Appendix M requires a design submission to TSSA that shall include a demonstrated need to use alternative overpressure protection methods and requires implementation verification by inspection and/or audit.
- c. ASME Sections VI and VII are recommended practices only and Section XII are federally regulated pressure vessels.

B31.1-2012  
*Power Piping Code*

B31.3-2012  
*Process Piping*

B31.5-2010  
*Refrigeration Piping and Heat Transfer Components*

B31.9-2011  
*Building Services Piping*

*Additional notes to CAD Amendment:*

*Refer to B51 Clause 8.1(a)(v), where soldered joints are not permitted for air piping.*

CSD-1-2012  
*Controls and Safety Devices for Automatically Fired Boilers*  
excluding Part CF Combustion Side Control

PVHO-1-2012  
*Safety Standard for Pressure Vessels for Human Occupancy*

**The American Society of Nondestructive Testing**  
ASNT SNT-TC-1A  
*Personnel Qualification and Certification in Nondestructive Testing (2011)*

**Copper Development Association Inc.**  
*The Copper Tube Handbook (2010)*

**CGSB (Canadian General Standards Board)**  
CAN/CGSB-48.9712-2006 / ISO 9712: 2005  
*Non-destructive Testing: Qualification and Certification of Personnel*

**MSS (Manufacturers Standardization Society)**  
SP-25-2008  
*Standard Marking Systems for Valves, Fittings, Flanges and Unions*

**National Board of Boiler and Pressure Vessel Inspectors**  
NB-18  
*Pressure Relief Device Certifications*

ANSI/NB 23  
*2011 National Board Inspection Code*

**NFPA (National Fire Protection Association)**  
NFPA 58-2011  
*Liquefied Petroleum Gas Code*

**PACE (Petroleum Association for the Conservation of the Canadian Environment)**  
Report No. 87-1  
*Guideline for the Impressed Current Method of Cathodic Protection of Underground Petroleum Storage Tanks*

*Additional notes to CAD Amendment: Although PACE no longer exists, a copy of this report can be obtained by contacting the Canadian Petroleum Products Institute.*

**RMA (Rubber Manufacturers Association)**

RMA IP-2:2009

*The RMA Hose Handbook, Eight Edition: 2009*

**ULC (Underwriters' Laboratories of Canada)**

CAN/ULC-S603.1-11

*Standard for External Corrosion Protection Systems for Steel Underground Tanks for Flammable and Combustible Liquids, Fourth Edition*

*Additional notes to CAD Amendment:*

*The following standards are not included in the list of references as they are under the scope of the Fuels Safety program at TSSA and the appropriate Code Adoption Document should be consulted to for the correct edition:*

*CAN/CSA B149.1 Natural Gas and Propane Installation Code*

*CAN/CSA B149.2 Propane and Storage and Handling Code*

*CAN/CSA-B149.5 Installation Code for Propane Fuel Systems and Tanks on Highway Vehicles*

**1.3 Clause 3 is amended:**

- i. by revoking the definitions of "Act", "Authorized inspection agency" and "Regulatory authority" with the following substituted:

**Act** – the Acts, regulations, or ordinances governing the design, fabrication, installation, repair, and alteration of boilers, pressure vessels, fittings, and piping and in the province of Ontario is the Ontario Technical Standards and Safety Act, 2000, Ontario Regulations for Boilers and Pressure Vessels, Minister's Order and Director's Orders.

**Authorized inspection agency** – the inspection agency authorized by the regulatory authority to perform inspections required under the Act and in the province of Ontario is the Technical Standards and Safety Authority.

**Regulatory authority** – the body responsible for administering and enforcing the Act governing the design, fabrication, installation, repair, and alteration of boilers, pressure vessels, fittings, and piping, in the province of Ontario is the Technical Standards and Safety Authority.

- ii. by adding the following to the end of the definition of "Fitting":

**Fitting** – Fittings as categorized in Table 1 including those described in NOTE (2) that are not attached to a boiler, pressure vessel, or piping under the Act, are exempt from CSA B51.

*Additional notes to CAD Amendment:*

*The definition for fitting identifies that it is not a fitting unless the fitting is attached to an item such as a boiler, pressure vessel or piping system that is under the regulation and this is consistent with O.Reg.220/01. That is stand-alone items that are best categorized as fittings are exempt and this includes category H items e.g. pressure vessel with a volume less than 1.5 cubic feet or a small piping system that has an internal diameter less than 6" and internal volume less than 1.5 cubic feet.*

**1.4 Clause 4.1.1 is revoked and substituted with the following:**

**4.1.1**

The calculations, drawings, and specifications, pertaining to the designs of boilers, pressure vessels, and fittings as specified in Clause 4.2, fired-heater pressure coils, and piping shall be

submitted to the regulatory authority in the province where the item is intended to be used. The submission shall identify the substance for which the item is intended. It shall be the responsibility of the users or an agent they designate to determine whether the substance is lethal. Items less than 6" in internal diameter or less than 1.5 cubic feet in internal volume are classified as Category "H" fittings not pressure vessels. The name of the authorized inspection agency to be employed when a boiler or pressure vessel is to be manufactured outside Canada shall also be submitted when required by the regulatory authority. Acceptance and registration should be obtained before construction commences. A person may commence construction before the submission is registered if the person assumes all risks related to the construction, whether for an installation or alteration.

Use of ASME Section VIII, Division 1, Appendix M requires an approval by TSSA which shall include a demonstrated need for alternative methods.

*Additional notes to CAD Amendment:*

**Clause 4.1.1** is amended by the following sentence being revoked from this clause: "The name of the authorized inspection agency to be employed where a boiler or pressure vessel is to be manufactured outside Canada shall also be submitted where required". Also, reference to Figures 1a), 1b) and 1c) are also removed and are superseded by the exemptions in O.Reg. 220/01 section 2.(2), for pressure vessels. Also O.Reg.220/01 Section 4.(2) permits construction to begin for a design that has been submitted for registration however registration has not been completed provided the person assumes all risks related to the construction.

**1.5 Clause 4.2.1** the second sentence is revoked and substituted with the following:

Registrations of fittings shall be resubmitted for validation not more than ten years after the date of acceptance by the regulatory authority in the original registering province. Validation of fitting registration in Ontario needs to be submitted to Technical Standards and Safety Authority and where original registration was obtained in another province prior to Ontario, validation in that province shall be obtained prior to submitting to Technical Standards and Safety Authority.

*Additional notes to CAD Amendment:*

*A central registration system has not been created.*

**1.6 Clause 4.2.3** is revoked.

*Additional notes to CAD Amendment:*

*A central registration system has not been created.*

**1.7 Clause 4.3.2** is amended with the following added:

Items previously registered in a province other than Ontario or to be registered as pressure vessels in another province that are defined as fittings in Ontario will be registered with the same CRN issued plus the suffix '.5 FITG'.

**1.8 Clause 4.3.4** is revoked and substituted with the following:

**4.3.4**

The number allotted to a registered design of a fitting shall be a number preceded by a zero and the category letter and followed by a decimal point, to the right of which shall be added the digit or letter indicating the first province in which the design is registered.

*Additional notes to CAD Amendment:*

*A central registration system has not been created.*

**1.9 Clause 4.4.2** is revoked and substituted with the following:

**4.4.2**

Welding or brazing procedures used for equipment fabricated outside Canada for installation in Ontario shall be approved by an authorized inspection agency that is acceptable to Technical Standards and Safety Authority.

**1.10 Clause 4.5.3** is revoked and substituted with the following:

**4.5.3**

Welder, welding operator or brazer, brazing operator performance tests for equipment fabricated outside Canada for installation in Ontario shall be approved by an authorized inspection agency that is acceptable to Technical Standards and Safety Authority.

**1.11 Clause 4.7.2** is amended by revoking Notes 1) and 2) and the following substituted:

Notes:

- 1) NBIC ANSI/NB-23 shall be used as a guide for the development of repair or alteration procedures for equipment operating in Ontario.
- 2) Annex B is not adopted. Requirements for preauthorization of repairs are prescribed by Technical Standards and Safety Authority.

*Additional notes to CAD Amendment:*

*Note 2, a TSSA Certificate of Authorization is required for owner/user programs for self-inspection of repairs. Instructions for obtaining this authorization are provided for in TSSA's quality program document, "Accreditation of Owner/User Self-Inspection Repair Program".*

**1.12 Clause 4.7.3** is revoked and substituted with the following:

**4.7.3**

Hot tapping should be considered only when no alternative method is feasible or practical. Regulatory authority acceptance of the proposed procedure, including joint design, welding method, and base material identification, shall be obtained. Appropriate safety precautions shall be taken. The hot tapping experience and competency of the company and personnel performing this activity may be considered by the regulatory authority.

**1.13 Clause 4.8.1** is revoked and substituted with the following:

**4.8.1**

Shop inspection of boilers, pressure vessels, fire-heated pressure coils, or piping covered by this Standard shall be conducted as follows:

- (a) In Canada, by an inspector employed by the regulatory authority in the province of fabrication.
- (b) Outside Canada, by an authorized inspection agency acceptable to Technical Standards and Safety Authority. Authorized inspection agencies include ASME accredited inspection agencies.

**1.14 Clause 4.8.2** is revoked and substituted with the following:

**4.8.2**

Vessels shall be subject to individual shop inspection except as follows:

- (a) low-pressure steel boilers with 30 ft<sup>2</sup> (2.79 m<sup>2</sup>) or less of wetted heating surface;
- (b) cast iron sectional boilers;
- (c) miniature pressure vessels, as defined in Section VIII, Division 1, of the ASME Code, when the manufacturer has registered its quality control manual with the regulatory

- authority where the manufacturing shop is located and has completed a manufacturer's data report for miniature pressure vessels (see figure D.1(a));
- (d) hot water tanks, hydropneumatic tanks, and cushion tanks 24 in (610 mm) diameter or less;
  - (e) propane storage tanks for recreational vehicles not exceeding 0.09 m<sup>3</sup> (3.2 ft<sup>3</sup>) in volume and 2143 k Pa (312 psi) in design pressure;
  - (f) low pressure electric boilers of a capacity 30 kW or less;
  - (g) small pressure vessels registered as Category H fittings;
  - (h) high-pressure boilers with 10 ft<sup>2</sup> (0.93 m<sup>2</sup>) or less of wetted heating surface or a power rating of 10 kW or less;
  - (i) any other applicable exemptions provided for in O.Reg. 220/01 Section 2.(2).

*Additional notes to CAD Amendment:*

*The limits for these exemptions come from the Boilers and Pressure Vessels Regulation, O.Reg. 220/01, Section 2.(2) and refer to this Section in the Regulation for a complete list of exemptions for the province of Ontario.*

**1.15 Clause 4.8.3** is revoked and the following substituted:

**4.8.3**

- (a) The manufacturer's data report is required to be submitted to the Technical Standards and Safety Authority for items subject to shop inspection as per clause 4.8.2 and items (b) and (c) (as amended in subsection 1.14 above). No data report is required for Clause 4.8.2(g).
- (b) An installation inspection by the Technical Standards and Safety Authority inspector is required for all items listed in 4.8.3 (a). After acceptance of the installation inspection by the Technical Standards and Safety Authority inspector, a Certificate of Inspection will be issued to the owner permitting operation of the item.

*Additional notes to CAD Amendment:*

*The owner is responsible to ensure that a Certificate of Inspection is in place prior to operation of the equipment. Also to note submittal of the completed Data Report to TSSA often triggers the scheduling of the installation inspection by the local TSSA inspector with the equipment owner.*

**1.16 Clause 4.9.2** is amended by revoking the Note and the following substituted:

Note: Annex C is not adopted. Requirements for an organization desiring to set, service or repair Category "G" fittings except those of the non-reclosing type is prescribed by Technical Standards and Safety Authority.

*Additional notes to CAD Amendment:*

*The requirements for obtaining a TSSA Certificate of Authorization is provided in safety information bulletin SB00-3 Rev.3, "Ontario Requirements for the Repair of Pressure Relief Valves".*

**1.17 Clause 4.9.4** is revoked.

*Additional notes to CAD Amendment:*

*Any organization that engages in the supply of materials, including piping and fittings for use in pressure piping systems, is not required to demonstrate that a quality control system is in operation to TSSA.*

**1.18 Clause 4.10.1** is amended by adding the following:

Manufacturers of fittings holding a current certificate for CSA Z299 series of standards categories 1, 2 or 3, ISO 9001 or CAN/CSA-ISO 9001 for the range of products being manufactured shall also be deemed to have a satisfactory quality control system in operation.



*Additional notes to CAD Amendment:*

*TSSA accepts without further review or issuance of certificates of authorization to fitting manufacturers holding current certificates for CSA Z299 series of standards categories 1, 2 or 3, ISO 9001 or CAN/CSA-ISO 9001 for the manufacture of fittings.*

**1.19 Clause 4.10.2 is revoked and the following substituted:**

**4.10.2**

Manufacturers not holding an ASME Certificate of Authorization or manufacturers of fittings not holding a certificate as provided for in 4.10.1 may be eligible for acceptance of their boilers, pressure vessels, fittings, or piping by the regulatory authority under the following conditions:

- (a) For boilers and pressure vessels the manufacturer shall demonstrate by means of a written manual and by a review of the manufacturing facilities and procedures that the quality control system in operation meets the requirements of the applicable section of the ASME Code (e.g., Appendix 10, Section VIII, Division 1) or for fittings conforms to the quality control program described in Annex F or for piping conforms to a program that is deemed acceptable to Technical Standards and Safety Authority.
- (b) The manufacturer shall be deemed acceptable if the regulatory authority concludes, as a result of the review, that the manufacturer meets the requirements of the applicable section of the ASME Code, and confirms its conclusion in writing.
- (c) The manufacturer shall continue to be acceptable if subsequent reviews demonstrate that its manufacturing facilities and procedures meet the requirements of the applicable section of the ASME Code. If it is found that the manufacturer is not adhering to or implementing the procedures outlined in the quality control system, the approval of the regulatory authority may be withdrawn.

*Additional notes to CAD Amendment:*

*Quality program requirements for manufacturers of piping are as provided for in safety information bulletin, SB02-02 Rev. 1, "Requirements for the Manufacturers and Installers of Pressure Piping Parts and Systems".*

**1.20 Clause 4.11 is amended with the first sentence revoked and the following substituted:**

Manufacturers in countries other than Canada that manufacture and export boilers and pressure vessels to Canada shall hold an ASME Certificate of Authorization and ensure that all boilers and pressure vessels are stamped with the ASME code certification mark and the applicable designator.

*Additional notes to CAD Amendment:*

*Registration with the National Board of Boiler and Pressure Vessel Inspectors is not required.*

**1.21 Clause 4.12 is amended with the following addition:**

Other standards acceptable for nondestructive testing personnel shall include ASNT SNT-TC-1A.

**1.22 Clause 4.13 is revoked and replaced with the following:**

**4.13**

Tanks that contain water at a temperature not exceeding 65°C (150°F) and not exceeding 1100 kPa (250 psig) and not equipped with heating units shall not be subject to registration.

*Additional notes to CAD Amendment:*

*The limits for this exemption come from the Boilers and Pressure Vessels Regulation O.Reg. 220/01 section 2.(2)(e).*

**1.23 Clause 4.14 including Clauses 4.14.1 and 4.14.2 are revoked.**

*Additional notes to CAD Amendment:*

*Re-inspection is outside the scope of the Boilers and Pressure Vessels Regulations and is in the scope of the Propane and Storage and Handling Regulation, O.Reg. 211/01, Propane Storage and Handling Regulation and Propane Code Adoption Document under the TSSA's Fuels Safety program.*

**1.24 Clause 4.15 is revoked.**

*Additional notes to CAD Amendment:*

*Manufacture of original automotive equipment is regulated under Transport Canada Regulations. Conversions of automotive vehicles to compressed natural gas or hydrogen are under the TSSA, Fuels Safety program, Ontario Regulation 214/01. The TSSA Boilers and Pressure Vessels and Safety program provides third party design review and registration of cylinders in accordance with Part 2 where required by the federal or the Ontario Regulation.*

**1.25 Clause 6.2 is revoked and the following substituted:**

**6.2.**

The factor of safety and maximum allowable working pressure (MAWP) for a high-pressure lap-seam riveted boiler shall be based on the applicable code of construction and demonstrated compliance.



*Additional notes to CAD Amendment:*

*Clause 6.6 controls for thermal fluid heaters are considered to include pressure-relief devices and gage glasses.*

**1.26 Clause 7.4.1.1 is revoked and the following substituted:**

**7.4.1.1**

The Standard does not apply to a domestic water heater having a maximum internal diameter of 610 mm (24 in) and at a temperature that does not exceed 100°C (212°F) and a maximum heat input of 120 kW or less.

*Additional notes to CAD Amendment:*

*The limits for this exemption come from the Boilers and Pressure Vessels Regulation O.Reg. 220/01 section 2.(2)(f).*

**1.27 Clause 7.4.2.1 is revoked the following substituted:**

**7.4.2.1**

The Standard does not apply to a hot water tank having a maximum internal diameter of 610 mm (24 in) or less and at a temperature that does not exceed 100°C (212°F).

*Additional notes to CAD Amendment:*

*The limits for this exemption come from the Boilers and Pressure Vessels Regulation O.Reg. 220/01 section 2.(2)(f).*

**1.28 Clause 8.3 is revoked and the following substituted:**



**8.3**

Welded joints in a pressure piping system shall not be painted or covered, including buried piping systems (with one exception described below for buried water piping systems for snow-making equipment), until inspection by an authorized inspection agency has been completed.

The exception to this requirement is for buried water piping systems for snow-making equipment, with a pressure over 600 psi and less than or equal to 740 psi, shall not be subject to either

registration with TSSA or installation inspection by a TSSA authorized inspector, provided that the piping system is,

- a. designed and fabricated in accordance with ASME B31.1 or B31.3 and all piping material and fittings have a minimum design rating in accordance with ASME B16.5 Class 300, Material Group No. 1.1, and,
- b. installed by a certificate of authorization holder under ASME B31.1 or B31.3 issued by TSSA using qualified welders and welding procedures registered with by TSSA.

*Additional notes to CAD Amendment:*

*Refer to O.Reg 220/01, Section 2. (2) (p), for general buried water piping exemption requirement.*

**1.29 Clause 11.2** is amended by revoking the first sentence of the Note and the following substituted:

Note: Annex C is not adopted. Requirements for an organization desiring to set, service or repair Category "G" fittings except those of the non-reclosing type is prescribed by Technical Standards and Safety Authority.

*Additional notes to CAD Amendment:*

*The requirements for obtaining a TSSA Certificate of Authorization is provided in safety information bulletin SB00-3 Rev.3, "Ontario Requirements for the Repair of Pressure Relief Valves".*

**1.30 Figures 1 a), b) and c)** are revoked and replaced with the following:

Figures 1 a), b) and c)  
Items less than 6" in internal diameter or less than 1.5 cubic feet in internal volume are classified as Category "H" fittings not pressure vessels.

*Additional notes to CAD Amendment:*

*Pressure vessel minimum sizes are provided in O.Reg.220/01 section 2.(2)(q) and (r). Below these sizes, the items would be considered category H fittings however refer to additional notes in regards to the definition of a fitting (above).*

## **ANNEXES**

*Additional notes to CAD Amendment:*

**Informative Annexes:** Informative annexes that are not adopted are for information purposes only and are not mandatory. Adopted annexes are mandatory.

**1.31 Annex A** is not adopted.

**1.32 Annex B** is not adopted. Requirements for preauthorization of repairs are prescribed by Technical Standards and Safety Authority.

*Additional notes to CAD Amendment:*

*A TSSA Certificate of Authorization is required for owner/user programs for self-inspection of repairs. Instructions for obtaining this authorization are provided for in TSSA's quality program document, "Accreditation of Owner/User Self-Inspection Repair Program".*

**1.33 Annex C** is not adopted. Requirements for an organization desiring to set, service or repair Category "G" fittings except those of the non-reclosing type is prescribed by Technical Standards and Safety Authority.

*Additional notes to CAD Amendment:*

*The requirements for obtaining a TSSA Certificate of Authorization is provided in safety information bulletin SB00-3 Rev.3, "Ontario Requirements for the Repair of Pressure Relief Valves".*

**1.34 Annex D** is adopted as additional requirements.

*Additional notes to CAD Amendment:*

*These are considered acceptable sample forms.*

**1.35 Annex E** is adopted as additional requirements.

**1.36 Annex F** is adopted as additional requirements.

**1.37 Annex G** is revoked.

*Additional notes to CAD Amendment:*

*This subject is outside the scope of the Boilers and Pressure Vessels Regulations and is in the scope of the Propane and Storage and Handling Regulation O.Reg. 211/01 and Propane Code Adoption Document under the TSSA's Fuels Safety program. Fabrication inspection and design registration is conducted by the TSSA Boilers and Pressure Vessels Safety program in accordance with CSA B51 and the requirements of Annex G.*

**1.38 Annex H** is adopted as additional requirements and amended by revoking H4.3 items (b), (c) and (f) and substituted with the following:

- (b) power boilers in
  - (i) steam service operating above 103 kPa (15 psig), or
  - (ii) hot water service operating above 1100 kPa (160 psig) or 121°C (250°F),shall have a system test or lift test annually and shall be serviced every five years;
- (c) hot water heating boilers up to 1100 kPa (160 psig) at 121°C (250°F) shall have a manual lift test or system test every two years and serviced every six years;
- (f) vessels in
  - (i) ammonia, flammable cryogenic, and dry, flammable, non-corrosive, non-toxic, non-fouling gases shall be serviced every five years, or
  - (ii) non-flammable cryogenic and dry, non-flammable, non-corrosive, non-toxic, non-fouling gases,shall be serviced every five years and may be extended to 10 years if system pressure testing is performed every five years.

*Additional notes to CAD Amendment:*

1. *Servicing of relief valves in refrigeration service are addressed in CSA B52.*

◇ 2. *Servicing of relief valves for boilers other than steam or hot water service are considered under H 4.3 (a), with a maximum servicing interval of three years.*

## **CSA B51 - PART 2**

**1.39 PART 2** is revoked.

*Additional notes to CAD Amendment:*

*Manufacture of original automotive equipment is regulated under Transport Canada Regulations. Conversions of +automotive vehicles to compressed natural gas or hydrogen are under the TSSA, Fuels Safety program, Ontario*

*Regulation 214/01. The TSSA Boilers and Pressure Vessels and Safety program provides third party design review and registration of cylinders in accordance with Part 2 where required by the federal or the Ontario Regulation.*

## **CSA B51 - PART 3**

**1.40** PART 3 is revoked.

*Additional notes to CAD Amendment:*

*Part 3 is regulated under the Ontario Regulation 214/01 and administered by the TSSA Fuels Safety program.*

## **2.0 CSA B52**

Section 2.0 of the 2001 Boilers and Pressure Vessels Code Adoption Document is amended by revoking and replacing with the following:

**2.1** CSA B52-05 (R2009) *Mechanical Refrigeration Code*, (including B52S1-09 *Supplement No.1 to B52-05, Mechanical refrigeration code - March 2009*), is adopted with the following exceptions, additions or positions on requirements in the following referenced clauses from the Standard:

**NOTE:** *Reference Clauses as given in CSA B52.*

**2.2** Clause 2, Reference Publications, is revoked and the following substituted:

### **CSA (Canadian Standards Association)**

CSA B51-09 *Boiler, Pressure Vessel and Pressure Piping Code* (including Update Number 1 – March 2009)

CAN/CSA-B149.1-05

*Natural gas and propane installation code*

CAN/CSA-B149.2-05

*Propane storage and handling code*

C22.2 No. 63-93 (R2008)

*Household refrigerators and freezers (Bi-national standard with UL 250)*

C22.2 No. 92-1971 (R2008)

*Dehumidifiers*

C22.2 No. 117-1970 (R2012)

*Room Air Conditioners*

CAN/CSA-C22.2 No. 120-M91 (R2008)

*Refrigeration Equipment*

C22.2 No. 128-95 (R2009)

*Vending Machines*

CAN/CSA-C22.2 No. 236-11

*Heating and cooling equipment (Bi-national standard with UL 1995)*

CAN/CSA-Z234.1-00 (R2011)

*Metric Practice Guide*

## Ontario Electrical Safety Code 25<sup>th</sup> Edition / 2012

### *Additional notes to CAD Amendment:*

*Ontario Electrical Code is the publication that contains the complete text of C22.1-12, Canadian Electrical Code, Part I (22<sup>nd</sup> edition), and Ontario Amendments to that Code.*

### **American Conference of Governmental Industrial Hygienists**

*Annual Manual of Threshold Limit Values*

### **ASHRAE (American Society of Heating, Refrigeration and Air-Conditioning Engineers)**

*ANSI/ASHRAE 15-2010*

*Safety Standard for Refrigeration Systems*

*ANSI/ASHRAE Standard 34-2010*

*Designation and Safety Classification of Refrigerants*

### **ASME (American Society of Mechanical Engineers)**

*Boiler and Pressure Vessel Code, 2010*

*Section VIII Division 1, excluding Appendix M*

### *Additional notes to CAD Amendment:*

- a. *ASME editions listed are current at the time of issuance of this CAD Amendment however new construction requires that the current mandatory edition of the ASME code is used for at the time of design and construction of an item.*
- b. *ASME Section VIII, Division 1, Appendix M is not considered as adopted outright. For those installations requiring using alternate methods described in Appendix M shall make application to TSSA using the Variance Application form which can be downloaded from the TSSA website.*

**B31.5-2010**

*Refrigeration Piping and Heat Transfer Components*

### **ASTM International (American Society for Testing and Materials)**

**B 88-09**

*Standard Specification for Seamless Copper Water Tube*

**B 280-08**

*Standard Specification for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service*

**D 93-11**

*Standard Test Methods for Flash-Point by Pensky-Martens Closed Cup Tester*

### **IOR (Institute of Refrigeration)**

*Safety Code of Practice for Refrigerating Systems*

*Utilizing Carbon Dioxide Refrigerant, 2009*

### **National Research Council Canada**

*National Building Code of Canada, 2010*

### **Other publication**

*Vestergaard, Niels P., "CO2 refrigerant for industrial refrigeration," Danfoss Industrial Refrigeration, 2007*

- 2.3** **Clause 3.1** is amended with the following additions to definitions for "Act" and "Approved testing laboratory" as follows:

**Act:** For the province of Ontario, the applicable Act, is the Ontario Technical Standards and Safety Act, 2000, Ontario Regulations for Boilers and Pressure Vessels, Minister's Order and Director's Orders.

**Approved testing laboratory:** CSA, UL, and ULC are some testing laboratories acceptable to Technical Standards and Safety Authority.

- 2.4** **Clause 4.5.2** is amended with the following added to (i)(ii):

Requests shall be submitted to Technical Standards and Safety Authority for acceptance.

- 2.5** **Clause 5.1.2** is amended with the following added:

For installations in Ontario, design registration applications shall be submitted to Technical Standards and Safety Authority.

- 2.6** **Clause 5.1.3** is amended with the following added:

For installations in Ontario, data reports shall be submitted to Technical Standards and Safety Authority.

- 2.7** **Clause 5.3.1** is amended with the following added:

For installations in Ontario, drawings and specifications shall be submitted to Technical Standards and Safety Authority for registration.

- 2.8** **Note to Clause 5.3.1** is amended with the following added:

For installations in Ontario, standard drawings are submitted to Technical Standards and Safety Authority for registration and are issued a registration number in the format: P-STDxxxxx, where 'x' is a numbered digit.

- 2.9** **Clause 5.10.4.2** is amended with the following added:

For installations in Ontario, pressure test requirements are as given in this clause or as given in ASME B31.5.

- 2.10** **Clause 5.10.4.4** is amended with the following added:

For installations in Ontario, refrigerant pipe joints shall be exposed for view for visual inspection by the Technical Standards and Safety Authority inspector unless a prior alternate arrangement is determined with the agreement of the Technical Standards and Safety Authority inspector.

- 2.11** **Clause 5.10.4.5** is amended with the following added:

For installations in Ontario, all piping systems except systems meeting the requirements specified in clause 5.2, shall be inspected and pressure test witnessed by the Technical Standards and Safety Authority inspector unless a prior alternate arrangement is determined with the agreement of the Technical Standards and Safety Authority inspector.

- 2.12** **Clause 5.11.5** is amended with the following added:

For an installation in Ontario, the owner shall notify Technical Standards and Safety Authority of an explosion or rupture of a pressure vessel, fitting or piping or where an accident arises out of its operation or use that causes injury or death to a person or property damage.

*Additional notes to CAD Amendment:*

*Refer to O.Reg. section 8.(2) for details in regards to incident reporting to TSSA.*

**2.13 Clause 5.12** is amended with the following added to (a):

Substitution of refrigerant type requires permission from Technical Standards and Safety Authority which must be obtained and documented by a revised design registration submission.

**2.14 Clause 6.6** is revoked.

*Additional notes to CAD Amendment:*

*Electrical wiring is outside the scope of O.Reg. 220/01.*

**2.15 Clause 6.7** is revoked.

*Additional notes to CAD Amendment:*

*Gas devices are under the scope of the Fuels Safety program at TSSA.*

**2.16 Clause 7.3.6.1.3** is amended by the following addition to (c):

Requests shall be made to Technical Standards and Safety Authority for prior approval and may require approvals from other regulatory authorities.

**2.17 Clause 8.1** is amended by the following addition:

Discharge limits for refrigerants are outside Technical Standards and Safety Authority's jurisdiction.

**2.18 Clause 8.3** is amended by the following addition:

Storage of refrigerants is outside Technical Standards and Safety Authority's jurisdiction.

**2.19 Clause 8.4.1** is amended by the following addition to (a):

For installations in the province of Ontario, the Technical Standards and Safety Authority prescribe requirements to be followed for recertification of relief valves.

*Additional notes to CAD Amendment:*

*The requirements for obtaining a TSSA Certificate of Authorization for recertification of relief valves is provided in safety information bulletin SB00-3 Rev.3, "Ontario Requirements for the Repair of Pressure Relief Valves".*

**2.20 Clause 9.1** including Clauses 9.1.1 and 9.1.2 are revoked.

*Additional notes to CAD Amendment:*

*Personnel protective equipment is outside the scope of O.Reg. 220/01.*

## **ANNEXES**

*Additional notes to CAD Amendment:*

**Informative Annexes:** *Informative annexes that are not adopted are for information purposes only and are not mandatory. Adopted annexes are mandatory.*

**2.21 Annex B** is adopted as additional requirements.



**2.22** Annex I is adopted as additional requirements.

### **3.0 CSA N285.0**

Section 3.0 of the 2001 Boilers and Pressure Vessels Code Adoption Document is amended by revoking and replacing with the following:

The CSA N285.0-12/N285.6 SERIES-12 - General requirements for pressure-retaining systems and components in CANDU nuclear power plants/Material Standards for reactor components for CANDU nuclear power plants as amended from time to time is adopted.

### **4.0 Periodic Inspection**

Section 4.0 of the 2001 Boilers and Pressure Vessels Code Adoption Document is amended by revoking and replacing with the following:

*Additional notes to CAD Amendment:*

*Section 4.1 is unchanged. Section 4.2 supersedes Director's Order Reference Number BPV-12-01 Rev. 0 issued August 27, 2012.*

**4.1** The following classes of equipment are exempt from periodic inspection requirements.

- 4.1.1 Refrigerant pressure vessels and refrigerant receivers, except where the refrigerant is ammonia.
- 4.1.2 Blowdown tanks.
- 4.1.3 Water to water heat exchangers.
- 4.1.4 Compressed air receivers, where the maximum allowable working pressure (MAWP) is not greater than 250 psi and the capacity is not greater than 23 ft<sup>3</sup>.

**4.2** Every owner of a boiler or pressure vessel that is in operation or use shall have it inspected at a maximum interval not to exceed the intervals listed in the following table:

A	Deaerator	1 year
B	High Pressure Boiler	1 year
C	Low Pressure Boiler	2 years
D	Pressure Vessel	3 years
E	Pressure Vessel fitted with Quick-Opening Door	1 year

*Additional notes to CAD Amendment:*

- a. *The periodic inspection interval for hydropneumatic tanks and cushion tanks has been removed from the periodic inspection interval table. The net effect of this change is that these tanks are required to be periodically inspected as specified for item D for pressure vessels and that is at a maximum interval not to exceed 3 years.*
- b. *Periodic inspection may include both internal and external inspections of the boiler or pressure vessel and testing of related safety devices as instructed by the inspector.*

### **5.0 Ice Rinks for Hockey, Skating or Curling**

Section 5.0 of the 2001 Boilers and Pressure Vessels Code Adoption Document is amended by revoking and replacing with the following:

*Additional notes to CAD Amendment:*

*Section 5.0 is reprinted from the 2001 Boilers and Pressure Vessels Code Adoption Document with no changes for convenience.*

- 5.1 "direct expansion coils" means the piping in which liquid refrigerant is vaporized to produce ice in a rink for hockey, skating or curling.
- 5.2 The following shall apply to direct expansion coils using ammonia as the refrigerant:
  - (a) The direct expansion coils shall be provided with pipes and control valves installed outside the building in such a manner as to permit immediate discharge of the refrigerant to the atmosphere in case of an emergency.
  - (b) The point at which refrigerant is discharged to the atmosphere in (1) above shall be located away from any opening for a door, window or air-inlet of the rink or of any adjacent building:
    - (i) so that the fumes of refrigerant will not enter the rink or buildings, and
    - (ii) not less than fifteen feet above any of those openings.
- 5.3 The expansion coils shall be protected by dual relief valves set to function at a pressure of 75 psig.
- 5.4 Magnetically operated stop-valves that are energized and opened only when the motor driving the compressor is itself energized shall be provided on the high pressure side of the compressor.
- 5.5 The expansion coils shall be supported on solid foundations throughout their length.
- 5.6 The refrigerant shall be completely withdrawn from the expansion coils while the rink is being used for any purpose other than hockey, skating or curling.

## **6.0 Welder/Welding Operator and Brazer/Brazing Operator Authorization**

Section 6.0 of the 2001 Boilers and Pressure Vessels Code Adoption Document is amended by revoking and replacing with the following:

- 6.1 Following the initial authorization of the welder/welding operator (welder) or brazer/brazing operator (brazer) performance test, every welder or brazer shall be re-tested at an interval not to exceed 12 months with the following exceptions:
  - (a) For welders or brazers employed by an organization with a valid Certificate of Authorization for boiler or pressure vessel fabrication from Technical Standards and Safety Authority or ASME, shall have used the specific welding or brazing process at least every six (6) months and their employer maintains a record of this activity in accordance with their quality control manual accepted by Technical Standards and Safety Authority or ASME.
  - (b) For brazers employed by an organization with a valid Certificate of Authorization from Technical Standards and Safety Authority for refrigeration piping systems, shall have used the specific brazing process at least every six (6) months and their employer maintains a record of this activity in accordance with their quality control manual accepted by Technical Standards and Safety Authority.

*Additional Notes to CAD Amendment:*

- a. *Authorization is obtained following CSA B51 Clause 4.5 technical requirements. Test coupons are presented to the TSSA inspector for acceptance. If acceptable, the TSSA inspector will certify the welder/brazer performance qualification certificate by signing and dating the certificate.*

- b. For additional information about refrigeration piping refer to safety information bulletin SB06-01, "Refrigeration Piping Fabrication, Installation, Repair or Alteration".

## 7.0 Applications for an Ontario Certificate of Competency

The 2001 Boilers and Pressure Vessels Code Adoption Document is amended by adding the following Section 7.0:

### 7.1 Examinations Required for New or Reinstatement of an Ontario Certificate of Competency

Persons who intend to apply for an Ontario Certificate of Competency shall take and receive a passing grade for the following examinations:

- i. Ontario Certificate of Competency Examination administered by Technical Standards and Safety Authority, and
- ii. National Board Inservice Commission Examination administered by the National Board of Boiler and Pressure Vessel Inspectors (Columbus, Ohio, United States of America).

*Additional notes to CAD Amendment:*

*Examinations listed in Section 7.1 above are the examinations provided for in O.Reg. 220/01 Section 12. (4)(d).*

### 7.2 Applications for an Ontario Certificate of Competency

The applicant for an Ontario Certificate of Competency including new, renewal, reinstatement and transfer applications shall have a valid and current National Board Inservice Commission issued by the National Board of Boiler and Pressure Vessel Inspectors (Columbus, Ohio, United States of America).

*Additional notes to CAD Amendment:*

- a. *To maintain an Ontario Certificate of Competency, the applicant is responsible to complete continuing education as prescribed in NB-263 Rules for National Board Inservice and New Construction Commissioned Inspectors as well as keeping their knowledge current with respect to Ontario regulatory requirements.*
- b. *A complete set of instructions for applicants for the Ontario Certificate of Competency is provided in the safety information bulletin SB13-01, "Ontario Certificate of Competency for Insurers". The terms for renewals for those without a valid and current National Board Inservice Commission are also provided.*

## 8.0 Effective Date

These amendments are effective immediately.

ORIGINAL SIGNED

**Mike Adams**

Director, Ontario Regulation 220/01 (Boilers and Pressure Vessels), appointed under the *Technical Standards and Safety Act, 2000*