

	<b>Boilers and Pressure Vessels Safety Program</b>	<b>Ref No.: BPV-24-01</b>
	<b>Code Adoption Document Amendment</b>	<b><u>Published: August 15, 2024</u></b> <b><u>Effective: October 1, 2024</u></b>

IN THE MATTER OF:

*Technical Standards and Safety Act 2000*, S.O. 2000, c. 16,  
Ontario Regulation 223/01 (Codes and Standards Adopted by Reference), s. 2(2), and  
Ontario Regulation 220/01 (Boilers and Pressure Vessels)

The Director for the purposes of Ontario Regulation 220/01 (Boilers and Pressure Vessels), pursuant to section 2(2) of Ontario Regulation 223/01 (Codes and Standards Adopted by Reference), hereby provides notice that the BOILERS AND PRESSURE VESSELS CODE ADOPTION DOCUMENT published by the Technical Standards and Safety Authority and dated June 1, 2001, as amended, is further amended as follows:

**All sections of the Boilers and Pressure Vessels Code Adoption Document dated June 1, 2001 are hereby replaced with the following, and all previous amendments thereto are thereby superseded:**

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1.	CSA B51
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Background:

The Code Adoption Document (CAD) 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 CAD have the same meaning as in Ontario Regulation 220/01 (Boilers & Pressure Vessels) unless otherwise stated. In the event of conflict between a provision of this CAD and adopted codes and standards, this document shall prevail.

This CAD Amendment supersedes the previous CAD amendment published December 1, 2020 as amended January 12, 2021. The following provides a summary of changes from the previous CAD amendment:

- Section 1.0 is unchanged.
- Section 2.0 is revised in subsections 2.2, 2.3, 2.4, 2.6, 2.13, 2.14, 2.15, 2.19 and 2.25, added subsections 2.9, 2.10, 2.11, 2.17, 2.18, 2.22 and 2.27, deleted subsections from previous version 2.20, 2.23, 2.24, and 2.26.
- Section 3.0 is unchanged.
- Sections 4.0 through 9.0 are unchanged.

## 1.0. CSA B51

*Additional notes to CAD Amendment:  
Section 1.0 is revised in its entirety.*

- 1.1. **CSA B51-19** *Boiler, pressure vessel and pressure piping code*, 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, the references listed in this clause are revoked and the following substituted:

*CSA B52-23 Mechanical refrigeration code*

Unless otherwise stipulated by the Director or the design code, such as the ASME Boiler and Pressure Vessel Code, the latest edition of the following referenced standards listed below are adopted and come into force and effect 6 months after the date of publication of the applicable standard or code:

#### **CSA Group**

*ANSI Z21.13/CSA 4.9 Gas fired low pressure steam and hot water boilers*

*CSA/ANSI HGV 2 Compressed hydrogen gas vehicle fuel containers*

*CSA/ANSI NGV 2 Compressed natural gas vehicle fuel containers*

*CAN/CSA-ISO 9001 Quality management systems - Requirements*

*CAN/CSA-Z180.1 Compressed breathing air and systems*

*CAN/CSA-Z7396.1*

*Medical Gas Pipeline Systems - Part 1: Pipelines for medical gases, medical vacuum, medical support gases, and the anaesthetic gas scavenging systems.*

Note clause 8.3 and Technical Standards and Safety Authority authorized inspector instructions for piping inspection supersedes instructions for pressure testing in CSA Z7396.1, such as clauses 12 and B.1.

#### **ANSI/API (American National Standards Institute/American Petroleum Institute)**

*ANSI/API STD 530 Calculation of Heater Tube Thickness in Petroleum Refineries*

#### **ANSI/ASQ (American National Standards Institute/American Society of Quality)**

*Z1.4 Sampling Procedures and Tables for Inspection by Attributes*

#### **ANSI/CGA (American National Standards Institute/Compressed Gas Association)**

*ANSI/CGA G-2.1 Safety Requirements for the Storage and Handling of Anhydrous of Ammonia*

**API (American Petroleum Institute)**

*STD 520 Sizing, Selection of Pressure Relieving Devices, Part I – sizing and Selection*

**ARPM (Association for Rubber Products Manufacturers)**

*IP-2 Hose Handbook*

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

*Sections I, II Part A, II Part B, II Part C, II Part D, IV, V, VIII Division 1, VIII Division 2, VIII Division 3, IX and X of the Boiler and Pressure Vessel Code*

*Note: Use of ASME Section VIII Division 1, UG-140 (b) or Appendix M for pressure vessel installations requires Technical Standards and Safety Authority approval.*

*Additional notes to CAD Amendment:*

- a. Use of ASME Section VIII, Division 1, UG-140(b) or Appendix M require a design submission to TSSA that shall include a demonstrated need to use these methods and require implementation verification by inspection and/or audit.*
- b. ASME Sections VI and VII are recommended practices only and Section XII are federally regulated pressure vessels.*

*B31.1 Power Piping*

*B31.3 Process Piping*

*B31.5 Refrigeration Piping and Heat Transfer Components*

*CSD-1 Controls and Safety Devices for Automatically Fired Boilers*

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

**The American Society of Nondestructive Testing**

*Recommended Practice No. SNT-TC-1A Personnel Qualification and Certification in Nondestructive Testing*

*Note: The applicable edition is per the design code.*

**CDA (Copper Development Association)**

*A4015-14/17*

*Note: Pressure and temperature ratings listed do not supersede any required calculations of the applicable piping design and construction code.*

**CGSB/ISO (Canadian General Standards Board/International Organization for Standardization)**

*CAN/CGSB-48.9712 / ISO 9712 Non-destructive Testing: Qualification and certification of NDT personnel*

**ISO (International Organization for Standardization)**

*9001 Quality management systems – Requirements*

16528-1 *Boilers and pressure vessels – Part 1: Performance requirements*

Note: Use of ISO 16528-1 requires Technical Standards and Safety Authority approval through the variance process and refer to subsection 1.4 of this Code Adoption Document.

**MSS (Manufacturers Standardization Society)**

SP-25 *Standard Marking Systems for Valves, Fittings, Flanges and Unions*

**NACE International**

SP0285 *Corrosion Control of underground Storage Tank System by Cathodic Protection*

**National Board of Boiler and Pressure Vessel Inspectors**

NB-18 *Pressure Relief Device Certifications*

ANSI/NB 23 *National Board Inspection Code*

Note 1: ANSI/NB 23 Part 3 paragraph 3.4.2 is revoked.

Note 2: For discrepancies between ANSI/NB 23 requirements and CSA B51, the CSA B51 requirements shall prevail.

**NFPA (National Fire Protection Association)**

NFPA 58 *Liquefied Petroleum Gas Code*

**UL (Underwriters' Laboratories Inc)**

ANSI/UL 132 *Safety Relief Valves for Anhydrous Ammonia and LP-Gas*

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

CAN/ULC-S603.1 *Standard for External Corrosion Protection Systems for Steel Underground Tanks for Flammable and Combustible Liquids*

*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 for the correct edition:*

*CSA Z662 Oil and Gas Pipelines Systems*

*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** – means the Act(s), regulation(s), or ordinance(s) governing the design, fabrication, installation, repair, and alteration of boilers, pressure vessels, fittings, and piping and in the province of Ontario which is the Ontario Technical Standards and Safety Act, 2000, Ontario Regulation 220/01 (Boilers and Pressure Vessels) and any associated or adopted Minister's Order(s), Director's Order(s) or Code(s).

**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** – Category H fittings as described in Table 1 NOTE (2), that are not attached to a boiler, pressure vessel, or piping under the Act, are exempt from O. Reg. 220/01.

*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 captured by the regulation and this is consistent with O.Reg.220/01. Stand-alone items including category H items e.g. pressure vessel with 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, are exempt.*

- 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. 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, UG-140 (b) or Appendix M requires an approval by the Technical Standards and Safety Authority which shall include a demonstrated need for these methods.

Use of ISO 16528-1 is permitted for pressure equipment designs that are outside the scope of the ASME codes referenced in the CSA B51 standard and provided the same engineering philosophy, safety margins and administrative requirements in CSA B51 are followed.

*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”. Reference to Figures 1a), 1b) and 1c) included in section 1.35, below, are also removed and are superseded by the exemptions in O. Reg. 220/01 section 2(2), for pressure vessels. O.Reg.220/01 Section 4(2) permits construction to begin for a design that has been submitted for registration however in cases where registration has not been completed the owner assumes all risks related to the construction.

ISO 16528-1: A completed variance application form is required to be submitted to TSSA for use of ISO 16528-1.

**Clause 4.1.9 (b)** refers to used equipment, not equipment built for stock.

**Clause 4.1.9 (b) and (c)** may require an installation inspection by the TSSA authorized inspector. To note, pressure vessels which are for fuel application, such as propane storage tanks, refer to installation requirements specified by the Fuels Safety program at TSSA – these pressure vessels are not subject to an installation inspection by the Boilers and Pressure Vessels Safety program at TSSA.

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

**4.2.1**

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 the 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 the 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:*

**Clause 4.2.3** *A central registration system has not been created.*

**Clause 4.2.9** requirements for safety relief valves for propane storage tanks operating within the scope of the O.Reg.211/01 Ontario Propane Storage and Handling Regulation, are specified by the Fuels Safety program at TSSA which requires certification to ANSI/UL 132, "Standard for Safety Relief Valves for Anhydrous Ammonia and LP-Gas".

**1.7. Clause 4.3.2** is amended with the following added to the end of the existing clause:

**4.3.2**

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:*

**Clause 4.3.4** *a central registration system has not been created.*

**Clause 4.4.1** *welding and brazing procedure qualification records are used for the basis of registration of welding and brazing procedures in Ontario.*

**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 the Technical Standards and Safety Authority.

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

#### **4.5.3**

Welder, welding operator, brazer or 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 the 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) 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 the Technical Standards and Safety Authority.
- 3) Welded and non-welded boiler tube replacements are considered repairs and require inspections. Inspections of welded boiler tube replacements shall be performed by an inspector. Non-welded boiler tube replacement inspections shall be performed by an inspector, or may be witnessed by a certified chief operating engineer for the plant, only if a record is kept and made available to the inspector at the next periodic inspection.

#### *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".*

*O.Reg.220/01 s. 7.(5) repairs of insured equipment may be inspected by the insurer or the TSSA inspector.*

**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 before hot tapping commences. 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 the 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 shop inspection by an authorized inspector 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 and cast aluminum 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) low pressure electric boilers of a capacity 30 kW or less;
- (f) small pressure vessels registered as Category H fittings;
- (g) 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;
- (h) any other applicable exemptions provided for in O. Reg. 220/01 Section 2(2).

*Additional notes to CAD Amendment:*

*The limits for these exemptions (except items (b) and (c)) come from the Boilers and Pressure Vessels Regulation, O. Reg. 220/01, Section 2(2). Refer to this Section in the Regulation for a complete list of exemptions for the province of Ontario. Inspection of items (b) and (c) are in accordance with the ASME code.*

**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 and items (b) and (c) as per subsection 1.14 of this Code Adoption Document.
- (b) An installation inspection by a Technical Standards and Safety Authority inspector is required for all items listed in (a) of subsection 1.15. After acceptance of the installation inspection by a 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 for ensuring that a Certificate of Inspection has been issued prior to operation of the equipment. Also, note that 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 the Technical Standards and Safety Authority.

*Additional notes to CAD Amendment:*

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

**Clause 4.9.3:** *The requirements for obtaining a TSSA Certificate of Authorization for repairs and modifications for a boiler, pressure vessel, fitting, fired-heater pressure coil, or piping is posted on the TSSA website:*

<https://www.tssa.org/en/boilers-pressure-vessels/quality-program.aspx>

**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 4.10.1.1** is amended by adding the following at the end of the clause:

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:*

*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, are accepted by TSSA without further review or issuance of certificates of authorization.*

**1.19. Clause 4.10.1.2** 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.*

**1.20. Clause 4.10.2.1** is revoked and the following substituted:

**4.10.2.1**

Manufacturers of boilers, pressure vessels or piping not holding an ASME Certificate of Authorization or manufacturers of fittings not holding a certificate as provided for in 4.9.1.1 may apply to have their product accepted by the regulatory authority by meeting 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 by the Technical Standards and Safety Authority.
- (b) The manufacturer shall be 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. Approval must be issued by the regulatory authority in writing.

- (c) The manufacturer shall continue to be acceptable to the regulatory authority 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 effective immediately with both written and verbal notice to the manufacturer.

*Additional notes to CAD Amendment:*

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

- 1.21. Clause 4.11** is amended with the following addition to the end of the existing clause:

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

- 1.22. Clause 4.12** is revoked and replaced with the following:

**4.12**

Tanks that contain water at a temperature not exceeding 65°C (150°F) and not exceeding 1724 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 4.13** including **Clauses 4.13.1** and **4.13.2** 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, and Propane Code Adoption Document under the TSSA's Fuels Safety program.*

- 1.24. Clause 4.14** is revoked.

*Additional notes to CAD Amendment:*

**Clause 4.14** *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 federal law or the Ontario Regulation.*

- 1.25 Clause 5.1.1** is revoked and replaced with:

**5.1.1**

The nameplate stamping of every boiler, pressure vessel, and Category G fitting (see Table 1) shall include the Canadian Registration Number (CRN). The nameplate shall be stamped in accordance with the requirements of the appropriate section of the ASME Code, except for

- a) fusible plugs; and
- b) pressure relief valves (PRVs) used in propane service which are only UL listed as described in Clause 12.11.

The stamping for other categories of fittings where practical shall include, at a minimum, identification traceable to the manufacturer and to the CRN. This identification shall be submitted to the regulatory authority with the fitting registration.

*Additional notes to CAD Amendment:*

*A Canadian Central Registration Number (CCRN) does not exist. Requirements for safety relief valves for propane storage tanks operating within the scope of the O.Reg.211/01 Ontario Propane Storage and Handling Regulation, are specified by the Fuels Safety program at TSSA which requires certification to ANSI/UL 132, "Standard for Safety Relief Valves for Anhydrous Ammonia and LP-Gas".*

**Clause 5.3.1** requirements for safety relief valves for propane storage tanks operating within the scope of the O.Reg.211/01 Ontario Propane Storage and Handling Regulation, are specified by the Fuels Safety program at TSSA which requires certification to ANSI/UL 132, "Standard for Safety Relief Valves for Anhydrous Ammonia and LP-Gas" and therefore the UL certification mark is required on the nameplate or on the valve body for these valves.

**1.26. Clause 6.2.1** is revoked and the following substituted:

**6.2.1**

The factor of safety and maximum allowable working pressure (MAWP) for a high-pressure lapseam 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.*

**1.27. 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 which has a maximum internal diameter of 610 mm (24 in) and a maximum 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).*

**1.28. Clause 7.4.2.1** is revoked the following substituted:

**7.4.2.1**

The Standard does not apply to a hot water tank which has a maximum internal diameter of 610 mm (24 in) and a maximum 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).*

**1.29. Clause 8.1** parts (a), (b)(v) and (c) are amended with the following additions:

**8.1**

- (a) ASME (non-welded air piping in mines, in the main shaft, is included, whereas nonwelded air piping in mines outside of the main shaft are excluded);
- (b)(v) CSA Z7396.1;

Note clause 8.3 and Technical Standards and Safety Authority authorized inspector instructions for piping inspection supersedes instructions for pressure testing in CSA Z7396.1, such as clauses 12 and B.1.

(c) RMA IP-2 (flexible hoses are included, except when used for air piping in mines).

*Additional notes to CAD Amendment:*

*The exclusions for equipment in mines come from the Boilers and Pressure Vessels Regulation O. Reg. 220/01 section 2(2)(t) for flexible hoses and portable air piping used in mines.*

**1.30. Clause 8.3** is revoked and the following substituted:

**8.3**

Welded joints in a pressure piping system, including buried piping systems, shall not be painted or covered, until all required inspections by the Technical Standards and Safety Authority have been completed.

**1.31. Clause 8.6** is revoked and the following substituted:

**8.6**

For installations in the province of Ontario, the method by which any pressure piping system is to be tested and the test pressure to be used, shall be submitted for approval to the Technical Standards and Safety Authority.

**1.32. 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 the 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, "Ontario Requirements for the Repair of Pressure Relief Valves".*

**1.33. Clause 11.5** is revoked and replaced with the following:

**11.5**

Where an alteration to an existing pressure-retaining item is proposed the design of the alteration shall be submitted for review and approval by the Technical Standards and Safety Authority.

**1.34 Clause 12.2.2.2 b)** is revoked and replaced with the following:

**12.2.2.2 b)** the installation has been authorized by the Technical Standards and Safety Authority

*Additional notes to CAD:*

**Clause 12.2.2:** A design submission to TSSA shall include a demonstrated need to use isolation valves and compliance with ASME Section VIII, Division 1, Appendix M and requires implementation verification by inspection and/or audit.

**1.35. Clause 12.7.2.1** is amended by revoking the **Note** and replaced with the following:

**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 the Technical Standards and Safety Authority.

*Additional notes to CAD: Amendment: **Clauses 12.1.3 and 12.7.2.1:***

1. *The requirements for obtaining a TSSA Certificate of Authorization is provided in safety information bulletin SB00-3, “Ontario Requirements for the Repair of Pressure Relief Valves”.*
2. *Requirements for safety relief valves for propane storage tanks operating within the scope of the O.Reg.211/01 Ontario Propane Storage and Handling Regulation, are specified by the Fuels Safety program at TSSA which requires certification to ANSI/UL 132, “Standard for Safety Relief Valves for Anhydrous Ammonia and LP-Gas”. Therefore, valves certified only to ANSI/UL 132, valve repair or servicing is performed by the valve manufacturer.*

**Clause 12.4.3:** *Requests to extend Table 5 maximum servicing intervals or alternatives to the prescribed requirements shall be submitted for approval to TSSA and must include a copy of the servicing history justifying the extended interval and/or other information as prescribed by TSSA.*

**1.36 Clause 13.1** is amended by adding the following sentence to the end of the existing clause:

Boilers and pressure vessels regulated under O. Reg. 220/01 have mandatory in-service inspections which shall be conducted by persons with a valid Ontario Certificate of Competency (refer to CAD Amendment Section 8.0).

*Additional notes to CAD Amendment:*

*Refer to O.Reg.220/01 section (10) Periodic inspections. In the province of Ontario, mandatory periodic inspections of boilers and pressure vessels are inspected at a frequency specified in CAD Section 4.0, by a TSSA authorized inspector for uninsured equipment and by the insurer for insured equipment. An insurer is defined in O.Reg.220/01 Section 1(1) as a person licensed under the Insurance Act to undertake boiler and machinery insurance as defined by that Act.*

*Requirements for safety relief valves for propane storage tanks operating within the scope of the O.Reg.211/01 Ontario Propane Storage and Handling Regulation, are specified by the Fuels Safety program at TSSA which requires certification to ANSI/UL 132, “Standard for Safety Relief Valves for Anhydrous Ammonia and LP-Gas”.*

**1.37. Clause 13.1 Note (1)** is amended with the addition of the following sentence to the end of the existing clause,

Boilers and pressure vessels regulated under O. Reg. 220/01 have mandatory periodic inspection intervals as provided in CAD Amendment Section 4.0.

**1.38. 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). Items that are smaller than these minimum sizes, would be considered category H fittings subject to the additional notes with respect to the definition of a fitting (above). Other exemptions listed in O.Reg.220/01 section 2(2) are also applicable, including subsection (d), which exemption states a maximum allowable working pressure of 15 psig (103 kPa) or less.*

**1.39. Table 1** Note (2)(a) is revoked.

**1.40. Table 5** is revoked and replaced with the following:

- a. Power boilers:
  - i. steam service operating pressure above 103 kPa (15 psig) shall have a system test or lift test annually and shall be serviced every five years,
  - ii. hot water service operating pressure above 1100 kPa (160 psig) or above the temperature 121<sup>0</sup>C (250<sup>0</sup>F) shall have a system test or lift test annually and shall be serviced every five years;
- b. Heating boilers:
  - i. up to and including a maximum pressure of 1100 kPa (160 psig) at a maximum temperature of 121<sup>0</sup>C (250<sup>0</sup>F) shall have a manual lift test or system test every two years and shall be serviced every six years,
  - ii. steam service operating up to and including a maximum pressure of 103 kPa (15 psig) shall have a manual lift test annually and shall be serviced every five years;
- c. Pressure vessels and piping systems:
  - i. steam service shall be serviced every 5 years; where annual lift tests are conducted from the beginning of the service interval, servicing may be extended to a maximum of 8 years,
  - ii. air service shall be serviced every 5 years; where annual lift tests are conducted from the beginning of the service interval, servicing can be extended to a maximum of 10 years,
  - iii. Anhydrous ammonia; flammable, cryogenic and dry; flammable non-corrosive, non-toxic, non-fouling gases shall be serviced every 5 years,
  - iv. Non-flammable cryogenic and dry; non-flammable non-corrosive, non-toxic, non-fouling gases shall be serviced every 5 years; servicing may be extended to every 10 years if system pressure testing is performed every 5 years,
- d. Other pressure vessels and piping systems not listed above, including boilers other than steam or hot water service, shall be serviced every 3 years.

*Additional notes to CAD Amendment:*

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

## **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.*

**1.41. Annex A** is not adopted.

**1.42. Annex B** is not adopted. Requirements for preauthorization of repairs are prescribed by the 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".*

**1.43. 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 the 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 SB003, "Ontario Requirements for the Repair of Pressure Relief Valves".*

**1.44. Annex D** is adopted as additional requirements and is mandatory.

*Additional notes to CAD Amendment:*

*These are considered acceptable sample forms.*

**1.45. Annex E** is adopted as additional requirements and is mandatory.

**1.46. Annex F** is adopted as additional requirements and is mandatory.

*Additional notes to CAD Amendment:*

*Requirements for propane tanks operating within the scope of the Propane and Storage and Handling Regulation O. Reg. 211/01 are specified by 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.*

**1.47. Annex H** is adopted with the exception that H.4 is revoked.

*Additional notes to CAD Amendment:*

*H.4 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.*

**1.48. Annex I** is adopted as additional requirements and is mandatory, except I.7 and I.8 are revoked, I.7 is replaced with the following:

**I.7 Fusible plugs**

Fusible plugs shall be used in all solid fuel fired boilers. Fusible plus shall be replaced after 5 years. In addition, fusible plugs, shall be taken out, inspected, and scraped periodically.

*Additional notes to CAD:*

- 1. I.8 is under the regulatory authority of the Operating Engineers program at TSSA.*
- 2. Owner/users of historical boilers should contact TSSA for additional information on inspection and maintenance of their equipment.*

**1.49. Annex J** is adopted as additional requirements and is mandatory.

**1.50. Annex K** is adopted as additional requirements and is mandatory.

**1.51. Annex L** is not adopted.



## **CSA B51 - PART 2**

**1.52. 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 federal law or the Ontario Regulation.*

## **CSA B51 - PART 3**

**1.53. 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

*Additional notes to CAD Amendment:  
Section 2.0 has been revised.*

**2.1. CSA B52-23** Mechanical refrigeration code as amended from time to time, is hereby adopted with the following amendments:

**NOTE:** Reference Clause numbers are as given in CSA B52-23.

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

### **CSA Group**

*B51:19 Boiler, pressure vessel, and pressure piping code*

Unless otherwise stipulated by the Director, the latest edition of the below listed referenced publications come into force and effect 6 months after the date of their publication.

*B52HB A practical handbook for implementing CSA B52, Mechanical refrigeration code*

*B149.1 Natural gas and propane installation code*

*B149.2 Propane storage and handling code*

*Ontario Electrical Safety (which is comprised of the Canadian Electrical Code Part I together with specific Ontario Amendments)*

*C22.2 No. 92 Dehumidifiers*

*C22.2 No. 117 Room air conditioners*

*C22.2 No. 120 Refrigeration equipment*

*C22.2 No. 128 Vending machines*

*C22.2 No. 236 Heating and cooling equipment*

*CAN/CSA-C22.2 No. 60335-2 Household and similar electrical appliances — Safety — Part 2: Particular requirements for refrigerating appliances, ice-cream appliances and ice makers*

*CAN/CSA-C22.2 No. 60335-2-40 Household and similar electrical appliances — Safety — Part 2-40: Particular requirements for electrical heat pumps, air-conditioners and dehumidifiers*

*CAN/CSA-C22.2 No. 60335-2-89 Household and similar electrical appliances — Safety — Part 2-89: Particular requirements for commercial refrigerating appliances and ice-makers with an incorporated or remote refrigerant unit or motor-compressor*

*SPE-1000 Model Code for the field evaluation of electrical equipment*

*Z316.5 Fume hoods and associated exhaust systems*

### **ACGIH (American Conference of Governmental Industrial Hygienists)**

*Annual Manual of Threshold Limit Values*

### **AHRI (Air-Conditioning, Heating, and Refrigeration Institute)**

*700 Specifications for Refrigerants*

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

*15 Safety Standard for Refrigeration Systems*

*34 Designation and Classification of Refrigerants*

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

*Sections II, V, VIII, IX, X and XIII of the Boiler and Pressure Vessel Code*

*B31.5 Refrigeration Piping and Heat Transfer Components*

**ANSI (American National Standards Institute)/ASHRAE (American Society of Heating, Refrigeration**

**and Air-Conditioning Engineers)/ACCA (Air Conditioning Contractors of America)**

*180 - Standard Practice for Inspection and Maintenance of Commercial Building HVAC Systems*

**ASTM International**

*B88 - Standard Specification for Seamless Copper Water Tube*

*B280 - Standard Specification for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service*

*B819 - Standard Specification for Seamless Copper Tube for Medical Gas Systems*

**Government of Canada**

*Environmental code of practice for the elimination of fluorocarbon emissions from refrigeration and air conditioning systems*

**IIAR (International Institute of Ammonia Refrigeration)**

*2 - Standard for Design of Safe Closed-Circuit Ammonia Refrigeration Systems*

*8 - Decommissioning of Closed-Circuit Ammonia Refrigeration Systems*

**IOR (Institute of Refrigeration)**

*Safety Code of Practice for Refrigerating Systems Utilising Carbon Dioxide Refrigerant*

**National Research Council Canada**

*National Building Code of Canada*

**ULSE Inc.**

*207 Standard for Refrigerant-Containing Components and Accessories, Nonelectrical*

*507 Electric Fans*

*705 Power Ventilators*

**Other publication**

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

**2.3. Clause 3.1** is amended by adding the following definitions:

**Act** – *Technical Standards and Safety Act, 2000*, Ontario Regulation 220/01 (Boilers and Pressure Vessels), and any applicable Minister’s Orders and Director’s Orders.

**Approved testing laboratory** – Organizations accredited by the Standards Council of Canada to test equipment and components to the applicable standards for the purposes of the Act.

**Qualified Person** – A person who meets all the requirements as specified by Technical Standards and Safety Authority.

Note: Requirements for Qualified Person can be found in the TSSA publication about “Alternate Process for Pressure Piping Inspection in Ontario” (latest edition)

**2.4. Clause 5.1.3** is amended with the following added to the end of the existing clause:

For installations in Ontario, data reports shall be submitted to the Technical Standards and Safety Authority. Data reports for vessels registered with The National Board of Boiler and Pressure Vessels Inspectors do not require submission to TSSA.

**2.5. Note to Clause 5.3.1** is amended with the following added to the end of the existing clause:

For installations in Ontario, Technical Standards and Safety Authority will accept standard drawings for registration and acceptance.

Additional note: Registered and accepted standard designs will be issued a registration number in the format: P-STDxxxxx, where 'x' is a numbered digit.

**2.6. Clause 5.6.1.2** is revoked and substituted with the following:

Stress corrosion cracking

Pressure 5.6.1.2 vessels containing ammonia, except for vessels primarily containing oil, shall be manufactured and operated as follows to minimize risk of stress corrosion cracking:

- a. with hot formed heads, or cold formed heads that have been stress relieved; and
- b. with a means of removing oxygen and other non-condensable gases from the system, such as an auto purger, or inspection with manual purge;

Note: TSSA recommends consideration of post-weld heat treat (PWHT) to further reduce risk of stress corrosion cracking for all high-temperature vessels constructed from carbon steel.

An example of vessel construction that cannot be post-weld heat treated is a vessel with materials, such as gaskets, used for internals which cannot tolerate temperatures used for post weld heat treatment. For further information, refer to Appendix H in IIAR-2.

**2.7. Clause 5.7.1** is revoked and substituted with the following:

5.7.1 Refrigerant piping and fittings

Refrigerant piping and fittings shall be either of the following:

- a) registered in accordance with CSA B51 and shall be designed, constructed, and tested in accordance with ASME B31.5 or the ASME Boiler and Pressure Vessel Code, Section VIII, Division 1;
- b) part of refrigeration systems that complies to requirements of Clause 5.2;
- c) for A1 and A2L systems where design pressure is 700psi or less, registered in accordance with CSA B51 and shall be certified; designed, constructed, and tested in accordance with UL 207; or
- d) for copper tubing, where a non-adjustable overpressure protection device limits the system pressure to a maximum of 120% of the maximum operating pressure, maximum operating pressure for calculating minimum pipe thickness shall be in accordance with ASME B31.5 Section 502.2.3 as permitted for variations from normal operation. For overpressure protection device limits, refer to clause 7.2.2.

**2.8. Clause 5.7.3** is revoked and substituted with the following:

5.7.3 Evaporator and condenser coils and associated headers

Evaporator and condenser coils and associated headers shall be either of the following:

- a) registered in accordance with CSA B51 and designed, constructed, and tested in accordance with ASME B31.5 or the ASME Boiler and Pressure Vessel Code, Section VIII, Division 1;
  - i) for qualification of the pressure-temperature rating a minimum 3 times pressure test as per ASME B31.5 is permitted;
  - ii) certification of UL 207 satisfies this requirement;
- or
- b) part of a refrigeration system that complies with the requirements of Clause 5.2.

**2.9. Clause 5.10.4.2** is amended with the following added to the end of the existing clause:

For installations in Ontario, pressure test requirements must be either in accordance with this clause or alternatively in accordance with ASME B31.5.

**2.10. Clause 5.10.4.4** is amended with the following added to the end of the existing clause:

For installations in Ontario, refrigerant pipe joints shall be exposed for view for visual inspection by a Qualified Person for the Alternate Piping Process or by a Technical Standards and Safety Authority inspector, unless a prior alternate arrangement is reached with a Technical Standards and Safety Authority inspector and written confirmation of the agreement is confirmed by the Technical Standards and Safety Authority.

**2.11. Clause 5.10.4.5** is amended with the following added to the end of the existing clause:

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 a Technical Standards and Safety Authority inspector or Company Qualified Person if installed pursuant to the Alternate Piping Process publication by TSSA unless a prior alternate arrangement is reached with a Technical Standards and Safety Authority inspector and written confirmation of the agreement is confirmed by the Technical Standards and Safety Authority.

**2.12. Clause 5.12** is amended with the following added to the end of the existing clause (a):

Substitution of refrigerant type requires submission of a revised design registration submission and approval from the Technical Standards and Safety Authority.

**2.13. Clause 5.13** item d) is revoked and replaced with the following:

d) Monitor the secondary coolant for developing hazardous refrigerant exposure on an annual basis, such that timely repairs are completed. As a best practice, monitoring twice per year is suggested.

**2.14. Clause 6.3.1 b)** is revoked and substituted with the following:

b) All doors shall be approved self-closing tight fitting fire doors and open outwards. Doors that directly open to the interior of the building must be tightly sealed. For rooms containing refrigerants B2L, A2, B2, A3 and B3, the room shall have at least one exit door that opens directly to the outdoors. Other exits leading from the building are permitted, but shall be through a vestibule equipped with approved self-closing, tight-fitting fire doors where such vestibule is:

i) not less than 1.8 m long,

ii) ventilated

(A) naturally to outside air by a vent that has an unobstructed area of not less than 0.1 m<sup>2</sup> for each door that opens into the vestibule but not less than 0.4 m<sup>2</sup>, or

(B) mechanically at a rate of 14 m<sup>3</sup>/h for each square metre of vestibule floor surface area, and

iii) has openings between the vestibule and an adjoining occupancy provided with self-closing doors with no hold-open devices.

**2.15. Clause 6.6** is revoked and substituted with the following.

All electrical work and wiring, including the installation of electrical equipment, shall be done in accordance with the requirements of the Ontario Electrical Code, Part I.

- 2.16. Clause 7.1.1** is amended by adding the following to the end:  
Rules for the consideration of Section XIII Part 13.3 or Section VIII Appendix M for pressure vessel installations requires approval from the Technical Standards and Safety Authority.

*Additional notes to CAD Amendment:*

*Use of ASME Section XIII Part 13.3 or Section VIII Appendix M require a design submission to TSSA that shall include a demonstrated need to use these methods and require implementation verification by inspection and/or audit.*

- 2.17. Clause 7.3.6.1.3** is amended by adding the following to the end of existing clause (c):

Requests shall be made to the Technical Standards and Safety Authority for prior approval.

- 2.18. Clause 8.4.2** is amended by adding the following to the end of the existing clause (a):

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

*Additional notes to CAD Amendment:*

*Refer to Section 1.0 of this CAD. The requirements for obtaining a TSSA Certificate of Authorization for recertification of relief valves is provided in safety information bulletin SB00-3, "Ontario Requirements for the Repair of Pressure Relief Valves". For current TSSA safety bulletins, refer to TSSA's website: <https://www.tssa.org/en/boilers-pressure-vessels/legislation-and-regulatory-information.aspx>*

- 2.19. Clause 8.4.2** is amended by the following addition at the end of item i):

Regular system checks shall mean at least annually. As a best practice, monitoring twice per year is suggested.

- 2.20. Clause 9.3** is amended by the following addition to the end of the existing clause:

Owners/operators of a Pressure Vessel that is being decommissioned or taken out of service are required to notify Technical Standards and Safety Authority of the removal from service in writing as per sub-section 5.5.1 of this CAD.

## 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 and is mandatory.

### 3.0. CSA N285.0

*Additional notes to CAD Amendment:*

*Section 3.0 has been revised to the current code edition in this CAD amendment.*

The CSA N285.0-12/N285.6 SERIES-17 - 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. The applicable edition of this standard and any reference standards contained within, are in accordance with the Certificate of Authorization, and, License Condition and/or Owner's Approved Design Specification. Unless otherwise stipulated by the Director or design code, the latest edition of referenced standards are in force and effect 6 months after the date of publication.

*Additional notes to CAD Amendment:*

*New construction requires that the current mandatory edition of the ASME code is used at the time of design and construction of an item.*

### 4.0. Shop, Piping and First/Installation Inspections

*Additional notes to CAD Amendment:*

*Section 4.0 is unchanged in this CAD amendment.*

**4.1.** The inspection of a boiler, pressure vessel (shop inspection) or piping (piping inspection) shall be conducted by a Technical Standards and Safety Authority inspector at any stage of its manufacture or installation, as per the Code Adoption Document sections 1, 2 and 3. Boilers and pressure vessels must be inspected by a Technical Standards and Safety Authority inspector before the boiler or pressure vessel is first activated or put into use. This inspection is a "first" inspection for new boilers and pressure vessels or an "installation" inspection for used boilers and pressure vessels, when they are first installed at a new location.

*Additional notes to CAD Amendment:*

*Refer to O. Reg. 220/01, s. 9 (1) inspection requirements for equipment during the manufacturing process*

**4.2.** An inspection report, which permits the operation of a boiler or pressure vessel for a limited time, until such time as the Certificate of Inspection is issued, shall be issued by a Technical Standards and Safety Authority Inspector, on behalf of the Director, after a first or installation inspection has been passed.

*Additional notes to CAD Amendment:*

*Certificates of Inspection issued to boilers and pressure vessels listed in Section 5.1, below, do not require renewal.*

**4.3.** For piping, the certificate of inspection is included in the Piping Systems Installation and Test Data Report and does not require renewal.

*Additional notes to CAD:*

*Refer to O.Reg.220/01 Section 5 (1) every owner or operator of a boiler, pressure vessel, piping and fitting shall have a certificate of inspection.*

**4.4.** Inspections of fittings must be included in all boiler, pressure vessel or piping inspections. The issuance of a certificate of inspection for a boiler, pressure vessel or piping, or the



renewal of a certificate of inspection for a boiler or pressure vessel, as listed in section 5.2, includes its fittings.

*Additional notes to CAD Amendment:*

- a. Refer to definition for fitting in O.Reg.220/01 Section 1(1). By definition, fittings must be attached to a boiler, pressure vessel or piping. Those that are not, are exempt from O.Reg.220/01.
- b. Refer to section 5 of this CAD amendment below for mandatory renewals of certificates, mandatory periodic inspections and exemptions.

## 5.0 Periodic Inspections and Renewing Certificates of Inspection

*Additional notes to CAD Amendment:*

Section 5.0 is unchanged in this CAD amendment.

**5.1** The following classes of equipment are exempt from periodic inspection requirements:

**5.1.1** Refrigerant pressure vessels and refrigerant receivers, except where the refrigerant is ammonia.

**5.1.2** Blowdown tanks.

**5.1.3** Water to water heat exchangers.

**5.1.4** 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>

*Additional notes to CAD Amendment:*

Certificates of Inspection issued to boilers and pressure vessels listed in Sections 5.1.1 through 5.1.4 above do not require renewal.

**5.2** Every owner or operator of a boiler or pressure vessel, that is not exempted by 5.1 above, that is in operation or use, shall have it inspected at a maximum interval not to exceed the intervals listed in Table 1:

**Table 1 Periodic Inspection Intervals**

	Type of Boiler or Pressure Vessel	Frequency of Inspection
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 TSSA inspector or insurer. Pressure relief

*valves, category G fittings, used as primary overpressure protection devices for a boiler, pressure vessel or piping, has mandatory servicing requirements from CSA B51 and B52 as adopted in Sections 1.0 and 2.0 of this CAD and evidence of compliance will be verified at the time of periodic inspections for boilers and pressure vessels.*

- c. *Cylinders and tubes approved under Transport Canada regulations that meet the applicable Transport Canada requirements for periodic inspection, testing, certification and/or replacement may be attached to a TSSA-regulated piping system provided the cylinders and tubes have a valid qualification stamping or marking. TSSA inspectors or insurers may request the owner demonstrate proof that the cylinder is approved by Transport Canada with a valid date stamp that has not passed its date of expiry and that the cylinder is being used in accordance with its intended use.*

### **5.3 Renewal of Certificates of Inspection for Boilers and Pressure Vessels**

A certificate of inspection issued by the Technical Standards and Safety Authority to an owner or operator for equipment listed in Section 5.2, above, must be renewed at the intervals shown in Table 1. To obtain a certificate of inspection, every owner or operator must request a certificate of inspection from the Technical Standards and Safety Authority within 30 days of receiving a Record of Inspection from the Technical Standards and Safety Authority or an insurer for that equipment by:

- i. Completing the electronic application form on the BPV Portal or other instructions posted on the Technical Standards and Safety Authority website;
- ii. Submitting the fee as per fee schedule shown on the Technical Standards and Safety Authority website; and
- iii. Validating the Record of Inspection issued by the Technical Standards and Safety Authority or the insurer per instructions on the Technical Standards and Safety Authority website.

*Additional notes to CAD Amendment:*

- a. *Refer to O.Reg.220/01 section 5(2) an owner or operator of a boiler or pressure vessel who holds a record of inspection for it issued before O. Reg. 220/01 section 10.1 comes into effect on July 1, 2018, is deemed valid until the next periodic inspection interval, as shown in Table 1, Section 5.2 above.*
- b. *Refer to O.Reg.220/01 Section 10.1(3), every owner or operator requiring a certificate of inspection from TSSA for equipment listed in 5.2 above, shall submit to TSSA within 30 days of receiving the record of inspection.*
- c. *Records of inspection (ROI) submitted by the insurer to TSSA are considered to be submitted on behalf of the owner or operator. If the owner or operator finds their ROI not posted with the TSSA, they must contact their insurer. TSSA's contact centre will provide customer support for issues encountered during the ROI submission and COI application process. Contact centre information can be found on TSSA's website*
- d. *Owners or operators are not permitted to operate boilers or pressure vessels without a current certificate of inspection. Renewals must be completed prior to the expiry date of the existing certificate, including payment of fees. Insurers and owners are advised to allocate sufficient time for inspection scheduling ahead of the certificate expiry date to meet the 30-day regulatory requirement for ROI submission.*

### **5.4 Record of Inspection**

#### **5.4.1 Inspection Report**

Upon conducting the periodic inspection as required in 5.2, above, the insurer shall issue to the owner or operator an inspection report.

For those inspections that failed, the inspection report shall contain all instructions for the owner or operator for repairs or corrective actions required.

*Additional notes to CAD Amendment:*

*Refer to O. Reg. 220/01 Section 10(5) through (7) for owner or operator and insurer obligations with respect to inspection reports. Owners or operators and insurers must retain inspection reports for 6 years from the date of inspection.*

#### **5.4.2 Record of Inspection**

The Technical Standards and Safety Authority inspector or insurer conducting the required periodic inspection of the equipment listed in 5.2, above, shall issue a record of inspection (ROI) for each boiler or pressure vessel that has passed the inspection to the owner or operator and to the Technical Standards and Safety Authority within 30 days of the inspection date.

The Record of Inspection shall include the following information:

- i. Unique Identifier (the Technical Standards and Safety Authority numerical equipment identifier)
- ii. Owner / Operator Name
- iii. Owner / Operator Address
- iv. Owner / Operator Email Address
- v. Site Name
- vi. Insurer Name
- vii. Insurer Email
- viii. "Inspected on behalf of (Insurer Name)" where applicable
- ix. Inspection Date
- x. Inspection Type (Internal /External)
- xi. The Technical Standards and Safety Authority issued Ontario Certificate of Competency number
- xii. Inspection Status
- xiii. National Board Violation Category/Categories (if repairs or corrective measures were required)
- xiv. Maximum Allowable Working Pressure (MAWP)

*Additional notes to CAD Amendment:*

- a. ROI technical data is imbedded in the TSSA generated Unique identifier associated with each device. Selected TSSA technical data will be transferred to the associated certificate of inspection for each ROI.
- b. Refer to TSSA's website for current transmission instructions for Records of Inspection.
- c. For periodic inspections conducted by the TSSA inspector, the owner or operator will receive an inspection report. If the inspection report identifies the periodic inspection successfully passed, the inspection report is deemed to be the record of inspection and is considered submitted to TSSA on behalf of the owner or operator.

### **5.5 Notification of Changes to the Technical Standards and Safety Authority**

#### **5.5.1 Owner or Operator**

The owner or operator shall notify the Technical Standards and Safety Authority of the following changes with respect to a Certificate of Inspection issued to a boiler or pressure vessel within 10 calendar days of the change occurring:

- a. Removal from service (Boiler Removal Form)
- b. Change in owner or operator
- c. Change in insurer
- d. Where it is learned that there is a defect found that renders the equipment unsafe to operate. For this case, the owner or operator shall also notify their insurer.

### **5.5.2 Insurer**

Where the equipment is insured, the insurer shall notify the Technical Standards and Safety Authority of changes with respect to a Certificate of Inspection issued to a boiler or pressure vessel forthwith where the insurer has cancelled, suspended or not renewed the insurance.

### **5.5.3 Notification Information**

Notification to the Technical Standards and Safety Authority shall be made in writing to the attention of the Director and include the following information:

- a. Facility name and address;
- b. Equipment identified by the Technical Standards and Safety Authority Unique Identifier;
- c. Nature of the change;
- d. Current owner or operator and where applicable new owner or operator and related contact information; and
- e. Where insurer and/or insurance is changed, new insurer name and contact information and/or other insurance changes.

*Additional notes to CAD Amendment:*

- a. Refer to O. Reg. 220/01 Section 10.2 for notification requirements.
- b. Refer to TSSA's website for current forms to facilitate sending the complete information and transmission instructions.
- c. Refer to TSSA's website for the boiler removal form.

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

*Additional notes to CAD Amendment:*

*Section 6.0 is unchanged in this CAD amendment.*

- 6.1** "direct expansion coils" means the piping in which liquid refrigerant is vaporized to produce ice in a rink for hockey, skating or curling.
- 6.2** 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.
- 6.3** The expansion coils shall be protected by dual relief valves set to function at a pressure of 75 psig.
- 6.4** 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.
- 6.5** The expansion coils shall be supported on solid foundations throughout their length.

- 6.6** 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.

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

*Additional notes to CAD Amendment:*

*Section 7.0 is unchanged in this CAD amendment.*

- 7.1** 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) Welders or brazers employed by an organization with a valid Certificate of Authorization for boiler or pressure vessel fabrication from the 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 must have maintained a record of this activity in accordance with their quality control manual accepted by the Technical Standards and Safety Authority or ASME.
  - (b) Brazers employed by an organization with a valid Certificate of Authorization from the 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 must have maintained a record of this activity in accordance with their quality control manual accepted by the 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".

## **8.0 Applications for an Ontario Certificate of Competency**

*Additional notes to CAD Amendment:*

*Section 8.0 is unchanged in this CAD amendment.*

### **8.1 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 the 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 8.1 above are the examinations provided for in O. Reg. 220/01 Section 12. (4)(d).*

### **8.2 Education and Experience Required for an Ontario Certificate of Competency**

Persons who intend to apply for an Ontario Certificate of Competency shall have a minimum of 5 credit points accumulated in education and experience, with a minimum of 1 credit point in each area respectively, as set out in the National Board Document: NB-263, RCI-1 Rules for Commissioned Inspectors (RCI-1). Unless otherwise stipulated by the Director,

the latest edition of RCI-1 is adopted and comes into force and effect on the date as specified in the standard.

*Additional notes to CAD Amendment:*

*Refer to O.Reg.220/01 Section 12(4)(c).*

### **8.3 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 In-service Commission issued by the National Board of Boiler and Pressure Vessel Inspectors (Columbus, Ohio, United States of America). New applicants shall demonstrate evidence of compliance with sections 8.1 and 8.2 above.

*Additional notes to CAD Amendment:*

- a. To maintain an Ontario Certificate of Competency, the applicant is responsible for completing continuing education as prescribed in NB-263 Rules for National Board In-service 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 In-service Commission are also provided.*

## **9.0 Insurers and Third-Party Inspection Providers**

*Additional notes to CAD Amendment:*

*Section 9.0 is unchanged in this CAD amendment.*

### **9.1 Application for a Certificate of Authorization for Third Party Inspection Providers**

Applications for a certificate of authorization for Third Party Inspection Providers are made to the Technical Standards and Safety Authority. In order to verify the accuracy of the information provided, applications are subject to audit by the Technical Standards and Safety Authority. Applications shall be renewed on a triennial basis. If there is any change to information provided in the application or as an attachment or addendum to the application, notification of the change must be submitted to the Technical Standards and Safety Authority within 30 calendar days.

The application shall be signed by the responsible authority for the applicant and shall include the following information:

- a. Organization name, address and contact information;
- b. National Board Certificate of Accreditation as an Authorized Inspection Agency;
- c. A list of persons who will conduct inspections with valid Ontario Certificates of Competency;
- d. Organization chart with roles and responsibilities;
- e. Declaration of administrative controls for compliance with O.Reg.220/01 and relevant standards in the form of a written manual and or procedures with document control; and
- f. Confirmation of indoctrination and training of the persons conducting inspections.

*Additional notes to CAD Amendment:*

- a. Refer to O.Reg.220/01 Section 12.1(2) insurers may retain the services of a third-party inspection provider to conduct a periodic inspection provided the third-party inspection provider holds a current certificate of authorization issued by TSSA.*

- b. Refer to TSSA website for current application forms to facilitate submitting a complete application and for transmission information.

## 9.2 Requirements for Insurers

Any insurer that is licensed to underwrite insurance for equipment listed in section 5.2 above, shall submit a statement to be received by the Technical Standards and Safety Authority by the 30<sup>th</sup> day of September of each and every year attesting to the following:

- a. That during the previous 12 months, as calculated from the 1<sup>st</sup> day of July of the preceding year to the 30<sup>th</sup> day of June of the current year, they actively underwrote insurance for equipment listed in section 5.2 above and that all information that was submitted to the Technical Standards and Safety Authority during the 12-month period prescribed above was submitted in accordance with O.Reg.220/01 and this CAD amendment and is certified to be true and accurate; or;
- b. That during the previous 12 months, as calculated from the 1<sup>st</sup> of July of the preceding year to the 30<sup>th</sup> of June of the current year, they did not actively underwrite insurance for any equipment listed in 5.2 above; or
- c. For 2018 only, as calculated from the 1<sup>st</sup> day of July to the 31<sup>st</sup> of July, whether they actively underwrote insurance for equipment listed in section 5.2 above or they did not actively underwrite insurance for any equipment listed in section 5.2 above.

Every three years, or as directed by the Director, the Technical Standards and Safety Authority shall conduct an audit or compliance survey of all insurers active in insuring and inspecting boilers and pressure vessels. The purpose of the audit or compliance survey will be to determine compliance with O.Reg.220/01 and this CAD.

*Additional notes to CAD Amendment:*

- a. Refer to O.Reg.220/01 section 15 for requirements for insurers.
- b. Refer to TSSA website for current forms for attestation.
- c. The Financial Services Commission of Ontario posts annually in July a list of insurers licensed to underwrite boiler and machinery insurance. TSSA will send a notification to submit the annual attestation to all those that are listed by the Financial Services Commission of Ontario. Non-receipt of the TSSA notification does not exempt an insurer of the requirement to submit an attestation.

## 10.0 Effective Date

This amendment is effective October 1, 2024.

Signed on this 15<sup>th</sup> day of August 2024.



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**Kim Semper**

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