Boilers and Pressure Vessels Safety Program	Ref No.: BPV-25-01
Code Adoption Document Amendment	Published: TBD Effective: TBD

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Document dated June 1, 2001, are hereby replaced with the following, and all previous amendments thereto are thereby superseded:

CONTENTS

Section	Subject Matter
1.	CSA B51
2.	CSA B52
3.	CSA N285.0
4.	Shop, Piping and First/Installation Inspections
5.	Periodic Inspections and Renewing Certificates of Inspection
6.	Ice Rinks for Hockey, Skating or Curling
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8.	Applications for an Ontario Certificate of Competency
9.	Insurers and Third-Party Inspection Providers
10.	Effective Date

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 August 15, 2024. The following provides a summary of changes from the previous CAD amendment:

- Section 1.0 is revised.
- Section 2.0 section numbers are revised.
- Section 3.0 is revised.
- Sections 4.0 through 9.0 are revised.

1.0 CSA B51

CSA B51-24 *Boiler, pressure vessel and pressure piping code*, is hereby adopted with the following amendments:

1.1 **Clause 1.1** is amended with the following note added at the end of the clause:

Note: Item 1.1b is under the scope of Fuels Safety program.

1.2 **Clause 1.2b)** is revoked and substituted with the following:

b) inert-gas filled high voltage switchgear and control gear with an internal pressure that does not exceed 150 psi (1,030 kPa), rated 15 kW and above, that are located within an electric utility installation that has controlled access for maintenance or repair and that is not accessible to the public; and

1.3 **Clause 2** (Reference publications) is revoked and substituted with the following:

This Standard refers to the following publication, and where such reference is made, it shall be to the edition listed below:

CSA Group

CSA B52:23
Mechanical refrigeration code

For the following publications, unless otherwise stipulated by the Director or the design code, such as the ASME Boiler and Pressure Vessel Code, a reference shall be to the latest edition but shall come into force and effect six months after the date of publication:

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)

Boiler and Pressure Vessel Code 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 and XIII of the

Note: Rules for the consideration of Section XIII Part 13.3 or Section VIII, Division 1 Appendix M for pressure vessel installations requires approval from the Technical Standards and Safety Authority as mentioned in section 1.28.

Additional notes:
Use of ASME Section XIII Part 13.3 or Section VIII, Division 1, 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.

QAI-1
Qualifications for Authorized Inspection

B31.1
Power Piping

B31.3
Process Piping

B31.5

Refrigeration Piping and Heat Transfer Components

PVHO-1
Safety Standard for Pressure Vessels for Human Occupancy

ASTM International

Edition of referenced ASTM Standards shall be as per the design code.

A105/A105M
Standard Specification for Carbon Steel Forgings for Piping Applications

A106/A106M
Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service

A182/A182M
Standard Specification for Forged or Rolled Alloy and Stainless Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service

A213/A213M
Standard Specification for Seamless Ferritic and Austenitic Alloy-Steel Boiler, Superheater, and Heat-Exchanger Tubes

A216/A216M
Standard Specification for Steel Castings, Carbon, Suitable for Fusion Welding, for High-Temperature Service

A312/A312M
Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes

A333/A333M
Standard Specification for Seamless and Welded Steel Pipe for Low-Temperature Service and Other Applications with Required Notch Toughness

A334/A334M
Standard Specification for Seamless and Welded Carbon and Alloy-Steel Tubes for Low-Temperature Service

A350/A350M
Standard Specification for Carbon and Low-Alloy Steel Forgings, Requiring Notch Toughness Testing for Piping Components

A352/A352M
Standard Specification for Steel Castings, Ferritic and Martensitic, for Pressure-Containing Parts, Suitable for Low-Temperature Service

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: Please refer to section 1.29 of this CAD for use of ISO 16528-1.

9000
Quality Management Systems — Fundamentals and Vocabulary

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

1.4 Clause 3 Definitions is amended:

i. by revoking the definition of "Authorized inspection body" and substituted with the following:

Authorized inspection body – An authorized inspection agency as defined by ASME, or a Canadian provincial or territorial authority having jurisdiction.

ii. by amending the definition of Authority Having Jurisdiction (AHJ) with adding the following at the end of existing clause:

Technical Standards and Safety Authority (TSSA) is the authority having jurisdiction (AHJ) in the province of Ontario.

iii. by revoking the definitions of "External audit" and "Internal audit" under the Audit definition.

iv. by revoking paragraph (b) of the definition of Design Pressure (relating to CNG and hydrogen).

v. by adding the following definition:

Hydrogen electrolyzer – A device that uses electricity to split water into hydrogen and oxygen which in Ontario is considered a pressure vessel during its lifecycle for manufacturer certification, installation, registration, fabrication, certification, and periodic inspection.

vi. 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. Standalone items including category H items are exempt (e.g. pressure vessels 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).

1.5 Clause 4.1.1.2 is amended by revoking the Note and substituting 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 are 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 "Implementation Guideline for Companies requesting TSSA Certificate of Authorization for the Repair of Pressure Relief Valves" and in "Guide for Manufacturers, Fabricators, Installers, Repairers, Alterers and Audit Teams for the Certification of Pressure Relief Valve Repair Organizations".

1.6 Clause 4.1.1.4 is amended by adding following at the end of the existing clause:

> 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/certificate-authorization

1.7 Clause 4.1.1.5 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 to TSSA that a quality control system is in operation.*

1.8 Clause 4.1.2.1 is revoked and substituted with the following:

> Manufacturers of fittings (except Category G) holding a current certificate for CSA N299 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 N299 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.*

1.9 Clause 4.1.3.1 is revoked and the following substituted:

> **4.1.3.1 Eligibility Criteria**
>
> 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 4.1.1.1 may apply to have their product accepted by the authority having jurisdiction by meeting the following conditions:
>
> a) For boilers, pressure vessels, piping and fittings the manufacturer shall demonstrate by means of a written manual and by an audit 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) and conforms to the quality control program described in Annex F.

b) The manufacturer shall be acceptable if the authority having jurisdiction concludes, as a result of the audit, that the manufacturer meets the requirements of the applicable section of the ASME Code. Approval must be issued by the authority having jurisdiction in writing.

c) The manufacturer shall continue to be acceptable to the authority having jurisdiction if subsequent audits 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 authority having jurisdiction 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 prescribed in other TSSA safety information bulletins and guidelines.

1.10 Clause 4.2.2 is amended by adding the following to the end of the existing clause:

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'.

1.11 Clause 4.3 is amended by adding the following to the end of the existing clause:

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

1.12 Clause 5.1.1.1 is amended by revoking item (b).

1.13 Clauses 5.1.1.8 and 5.1.1.9 are revoked and substituted with the following:

Clause 5.1.1.8 High pressure boilers and high-energy steam piping systems in creep-fatigue service or cyclic service

High pressure boilers in creep-fatigue service or cyclic service and high-energy steam (HES) piping systems in creep-fatigue or cyclic service shall comply with the following requirements:

a) Owner is responsible that design is performed based on the design specification issued by owner and certified by a professional engineer, that shall include the following:
   i an appropriate program for lifetime in-service monitoring of the boiler and HES piping system, including monitoring operating conditions, quantifying operating cycles, and identifying if any degradation has taken place, to ensure the integrity of the equipment during operation; and
   ii specific limits or conditions, including cyclic service and other conditions of individual components or parts of the boiler and HES piping system, to allow it to be properly monitored during operation.

b) Registration submission must include all design details including number of cyclises. Changing an existing boiler operation from non-cyclic service to cyclic service shall be considered as alteration.

c) owner shall provide design specification and program for lifetime in-service monitoring to TSSA and inspection agency when requested.

d) When an existing boiler in creep-fatigue service is sold individually, and not as part of a plant, the current conditions assessment shall be submitted for TSSA review. A revised user's design specification shall be produced and shall be available on TSSA request to address the new operating conditions.

e) When ownership of a boiler changes, the new owner shall obtain from the previous owner the documentation related to the boiler design, construction, and operation (e.g., manufacturer's drawings, specifications, and instructions, engineering assessment reports, repair/alteration reports, in-service inspection reports, monitoring data); address boiler cumulative damage (e.g., creep, fatigue); and

   i verify and certify the acceptability of the original user's design specification as well as the condition of the boiler and HES piping system; or

   ii have a professional engineer prepare boiler assessment within the limitations of the manufacturer's design report and the condition of the equipment.

   iii All required documentation shall be available for TSSA review during installation inspection.

1.14 Clause 5.1.1.10 is amended by adding the following to the end of the existing clause before the note:

The engineering assessments shall not override TSSA's minimum periodic inspection cycle specified by this Code Adoption Document.

1.15 Clause 5.1.3 is revoked and substituted with the following:

5.1.3 Lap-seam riveted boilers

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.

1.16 Clause 5.1.7.4 is amended by adding the following note to the end of existing clause:

Note: *Controls for thermal fluid heaters are considered to include pressure-relief devices and gage glasses.*

1.17 Clause 5.2.2.1 is revoked and substituted with the following:

5.2.2.1 Water heater exemption

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).

1.18 Clause 5.2.3.1 is revoked and substituted with the following:

5.2.3.1 Hot water tank temperature exemption

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).

1.19 Clause 5.2.3.2 is revoked and substituted with the following:

5.2.3.2 Water tank size exemption

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).

1.20 Clause 5.2.4.13 is amended with the following added to the end of the existing clause:

Owner is responsible to ensure a properly designed blowoff vessel is utilized.

1.21 Clause 5.2.7.1 is revoked and substituted with the following:

5.2.7.1 Applicable Code
The design, construction, and installation of all pressure vessels and piping used for storage and handling of ammonia, other than those used in refrigeration service, shall comply with ANSI/CGA G-2.1 in addition to the requirements of Clauses 5.2.1, 5.2.7.2, and 5.2.7.3. Vessels in ammonia refrigeration service shall comply with requirements of section 2.5 in this CAD.

1.22 Clause 5.2.7.2 is revoked and substituted with the following:

5.2.7.2 Access openings
All vessels in ammonia refrigeration service shall follow the requirement specified in section 2.5 of this CAD. All other pressure vessels in ammonia service with a diameter of 915 mm (36 in) or greater, except shell and tube heat exchangers and those whose shape or use makes one impractical, shall have a manhole, in accordance with Clause 6.2.5.

1.23 Clause 5.2.7.3 is revoked and substituted with the following:

5.2.7.3 Additional design requirements

Except for vessels used in refrigeration systems, pressure vessels intended for use in anhydrous ammonia service shall:
a) follow all rules as specified in ASME Code Section VIII Division 1
b) be subjected to post-weld heat treatment before the hydrostatic test; and
c) have head and shell materials produced in accordance with fine-grain practice

1.24 Clauses 5.2.10.2, 5.2.10.4, 5.2.10.5, 5.2.10.6, 5.2.10.7, 5.3.2.1, 5.3.2.4, 5.3.2.5, 5.3.2.6, 5.3.2.7, 5.3.2.8, 5.3.2.9, 5.3.2.10.1, 5.3.2.10.2 and 5.3.2.10.3 are revoked and substituted with the following note:

Note: Compressed natural gas and hydrogen refuelling station ground storage vessels and pressure piping systems are outside the scope of the Boilers and Pressure Vessels Regulations and is in the scope of the TSSA's Fuels Safety program.

1.25 Clause 5.3.1 parts (a), (b)(v) and (c) are amended be adding the following to those paragraphs:

(a) *Note: Non-welded air piping in mines, in the main shaft, is included, whereas nonwelded air piping in mines outside of the main shaft is excluded*;

(b) … (v) CSA Z7396.1;

Note clause 6.3.3 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) ARMA 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.

1.26 Clause 6.2.2.1 is amended by adding the following note to the end of the existing clause:

Note: Welding and brazing procedure qualification records are used for the basis of registration of welding and brazing procedures in Ontario.

1.27 Clause 5.4.1 is amended by adding the following to the end of the existing clause:

Fitting registrations obtained in Ontario shall be submitted to the Technical Standards and Safety Authority for validation and where original registration was obtained in another province prior to being obtained Ontario, validation in that province shall be obtained prior to submitting to the Technical Standards and Safety Authority.

1.28 Clause 6.1.2 is revoked and substituted with the following:

6.1.2 User responsibilities

Pressure vessels designed to Section VIII, Division 2 or 3 of the ASME Code shall comply with the following requirements:

a) The certified user's design specification, shall include the following:

i an appropriate program for lifetime in-service monitoring of the pressure vessel, including monitoring operating conditions, quantifying operating cycles, and identifying if any degradation has taken place, to ensure the integrity of the pressure vessel during operation; and

ii specific limits or conditions, including cyclic and other conditions of individual components or parts of the pressure vessel, to allow it to be properly monitored during operation.

b) A certified user's design specification as per the requirements of the design code shall be provided as part of the design registration submission.

c) When ownership of a pressure vessel changes, the new owner shall

i verify and certify the acceptability of the original user's design specification and the manufacturer's design report, as well as the condition of the pressure vessel; or

ii have a professional engineer prepare the new user's design specification within the limitations of the manufacturer's design report and the condition of the pressure vessel, which shall be presented to a TSSA inspector upon request.

1.29 Clause 6.2.1.1 is revoked and substituted with the following:

6.2.1.1 Design registration by authorities

The calculations, drawings, and specifications, pertaining to the designs of boilers, pressure vessels, and fittings as specified in Clause 5.4, fired-heater pressure coils, and piping shall be submitted to the AHJ 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 and not pressure vessels. Acceptance and registration shall 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 XIII Part 13.3 or Section VIII Appendix M requires an approval by the Technical Standards and Safety Authority which will only be granted where there is 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:
Reference to Figures 1a), 1b) and 1c) included in section 1.51, 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.

1.30 Clause 6.2.4 is amended by adding the following note to the end of existing clause:

Note: Requirements for safety relief valves for propane storage tanks regulated under O. Reg. 211/01 (Propane Storage and Handling) are specified by the TSSA Fuels Safety Program which requires certification to ANSI/UL 132, "Standard for Safety Relief Valves for Anhydrous Ammonia and LP-Gas".

1.31 Clauses 6.2.6.1 and 6.2.6.2 are revoked and substituted with the following:

6.2.6.1 Impact testing requirements for carbon steel pipe, fittings, and forgings

Impact testing requirements for carbon steel pipe, fittings, and forgings for pressure vessels shall meet all requirement of the applicable code of construction.

1.32 Clause 6.3.2 is revoked and substituted with the following:

6.3.2 Welding or brazing tests outside Canada

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.

1.33 Clauses 6.3.7.1 and 6.3.7.2 are revoked and substituted with the following:

6.3.7.1 Impact testing requirements for carbon steel pipe, fittings, and forgings

Impact testing requirements for carbon steel pipe, fittings, and forgings for pressure piping shall meet all requirement of the applicable code of construction.

1.34 Clause 6.4.1 is revoked and substituted with the following:

6.4.1 Authorized inspector for manufacturing shop inspections

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

a) In Canada, by an inspector employed by the AHJ in the province of fabrication, The inspection may be carried out in ASME Code shops by an inspector holding a valid National Board Commission and employed by an authorized inspection body as defined in the ASME Code, in which case the boiler or pressure vessel shall be registered with the National Board, and

b) Outside Canada, by an authorized inspection body acceptable to the Technical Standards and Safety Authority. Authorized inspection bodies include ASME accredited inspection agencies. The boiler or pressure vessel data reports shall be registered with the National Board.

1.35 Clause 6.4.2 is revoked and substituted with the following:

6.4.2 Individual shop inspection of pressure vessels

Vessels shall be subject to individual shop inspection by an authorized inspector except as follows:

a) low-pressure steel boilers with 30 ft^2 (2.79 m^2) 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 AHJ 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^2 (0.93 m^2) or less of wetted heating surface or a power rating of 10 kW or less; and

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 of 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.

1.36 Clause 6.5.1 is amended by adding the following to the end of existing clause:

Note: *Requirements for safety relief valves for propane storage tanks regulated under O. Reg. 211/01 (Propane Storage and Handling) are specified by the TSSA Fuels Safety Program 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.*

1.37 Clause 6.5.2.1 is revoked and substituted with the following:

6.5.2.1 Nameplate marking

The nameplate marking of every boiler, pressure vessel, and Category G fitting (see Table 1) shall include the Canadian Registration Number (CRN). The nameplate shall be marked 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 5.5.7.

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

Additional notes to CAD Amendment:
Requirements for safety relief valves for propane storage tanks regulated under O. Reg. 211/01 (Propane Storage and Handling) are specified by the TSSA Fuels Safety Program which requires certification to ANSI/UL 132, "Standard for Safety Relief Valves for Anhydrous Ammonia and LP-Gas".

1.38 Clause 6.6.5.1 is revoked and substituted with the following:

6.6.5.1 Compliance Certification

a) A manufacturer's data report certifying compliance with the requirements of this Standard shall be submitted to the Technical Standards and Safety Authority for items subject to shop inspection as per Clause 6.4.2 including those described in paragraphs (b) and (c) of Clause 6.4.2.
b) Items subject to a shop inspection listed in the foregoing paragraph (a) shall be inspected by a Technical Standards and Safety Authority inspector prior to operation. A Certificate of Inspection will be issued to the owner permitting operation of the item after acceptance of the installation inspection by a Technical Standards and Safety Authority inspector.

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.

1.39 Clause 7.2.4.3 is amended by adding the following note to the end of existing clause:

***Note**: 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, as mentioned in section 1.37 of this CAD.*

1.40 Clause 7.3.3.2 is amended by adding the following notes to the end of the existing clause*:*

Notes:

The requirements for obtaining a TSSA Certificate of Authorization are provided in the TSSA publication "Implementation Guideline for Companies requesting TSSA Certificate of Authorization for the Repair of Pressure Relief Valves".

Requirements for safety relief valves for propane storage tanks regulated by O. Reg. 211/01 (Propane Storage and Handling) are specified by the TSSA Fuels Safety Program which requires certification to ANSI/UL 132, "Standard for Safety Relief Valves for Anhydrous Ammonia and LP-Gas". Therefore, for valves certified only to ANSI/UL 132, valve repair or servicing is performed by the valve manufacturer.

1.41 Clause 7.4.1.1 is amended by adding the following 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 Ontario, mandatory periodic inspections of boilers and pressure vessels are inspected at a frequency specified in the CAD by a competent person as described in Sections 4 and 5 of this document.

Requirements for safety relief valves for propane storage tanks regulated under O. Reg. 211/01 (Propane Storage and Handling) are specified by the TSSA Fuels Safety Program which requires certification to ANSI/UL 132, "Standard for Safety Relief Valves for Anhydrous Ammonia and LP-Gas".

1.42 Clause 7.4.2.3.1 is amended by adding the following to the end of the existing clause:

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 required by TSSA.

1.43 Clause 7.4.2.4 is amended by revoking the **note** and replaced with the following:

Note: *Annex C is not adopted. The requirements for obtaining a TSSA Certificate of Authorization are provided in the TSSA publication "Implementation Guideline for Companies requesting TSSA Certificate of Authorization for the Repair of Pressure Relief Valves" and in "Guide for Manufacturers, Fabricators, Installers, Repairers, Alterers and Audit Teams for the Certification of Pressure Relief Valve Repair Organizations".*

1.44 Clause 7.4.4.1.2 is revoked and substituted with the following:

7.4.4.1.2 Design review by AHJ

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.

1.45 Clause 7.4.4.1.3 is revoked and substituted with the following:

7.4.4.1.3 Prior agreement by AHJ

Repairs and alterations shall not be made to a pressure-retaining component of a boiler, pressure vessel, fired-heater pressure coil, piping or hydrogen electrolyzer regardless of size, without the prior agreement of TSSA.

Disassembly and assembly of welded and non-welded hydrogen electrolyzers regardless of size are considered repairs and require inspections. Inspections shall be performed by an inspector. Prior to any maintenance, repair or alteration of hydrogen electrolyzers, approval for work procedures shall be obtained from original electrolyzer manufacturer.

Notes:

1) *ANSI/NB-23 National Board Inspection Part 3 shall be used as a guide for the development of repair or alteration procedures for equipment operating in Ontario.*
2) *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 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"

1.46 Clause 7.4.4.2 is revoked and substituted 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 are prescribed by the Technical Standards and Safety Authority.*

Additional notes to CAD Amendment:
The requirements for obtaining a TSSA Certificate of Authorization are provided in the TSSA documents "Implementation Guideline for Companies requesting TSSA Certificate of Authorization for the Repair of Pressure Relief Valves" and "Guide for Manufacturers, Fabricators, Installers, Repairers, Alterers and Audit Teams for the Certification of Pressure Relief Valve Repair Organizations".

1.47 Clause 7.4.4.4.1 is revoked and substituted with the following:

7.4.4.4.1 Acceptance by AHJ

Hot tapping should be considered only when no alternative method is feasible or practical. AHJ 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 AHJ.

1.48 Clause 7.4.6 is revoked with the following note added.

Note:
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.

1.49 Table 1 is amended by revoking Note (2)(a).

1.50 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°C (250°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°C (250°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 five years; where annual lift tests are conducted from the beginning of the service interval, servicing may be extended to a maximum of eight years

ii. air service shall be serviced every five 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 five years

iv. Non-flammable cryogenic and dry; non-flammable non-corrosive, non-toxic, non-fouling gases shall be serviced every five years; servicing may be extended to every 10 years if system pressure testing is performed every five years

d. Other pressure vessels and piping systems not listed above, including boilers other than steam or hot water service, shall be serviced every three 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.*

1.51 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 and 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 smaller than these minimum sizes are 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 exempts pressure vessels, fittings and piping with a maximum allowable working pressure of 15 psig (103 kPa).

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.*

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.*

1.9 Clause 4.4.2 is revoked and substituted with the following:

4.4.2 Welding and brazing performed outside Canada

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.

1.19 Clause 4.10.1.2 is amended by revoking the first sentence and substituting the following:

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 and registered with the National Board of Boiler and Pressure Vessel Inspectors.

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.*

1.30 Clause 8.3 is revoked and substituted with the following:

8.3 Visibility of welded joints

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 substituted with the following:

8.6 Pressure testing of piping system

For installations in 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.

1.37 Clause 3.1 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.

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.

ANNEXES

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

1.52 Annex B is informative. 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".

1.53 Annex C is informative. 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 "Implementation Guideline for Companies requesting TSSA Certificate of Authorization for the Repair of Pressure Relief Valves" and in "Guide for Manufacturers, Fabricators, Installers, Repairers, Alterers and Audit Teams for the Certification of Pressure Relief Valve Repair Organizations".

1.54 Annex D is adopted as additional requirements and is mandatory.

Additional notes to CAD Amendment:
These are considered acceptable sample forms.

1.55 Annex E is adopted as additional requirements and is mandatory.

1.56 Annex F is adopted as additional requirements and is mandatory.

1.57 Annex G is revoked. Automotive propane vessels are outside the scope of the Boilers and Pressure Vessels Regulation and is in the scope of the TSSA's Fuels Safety program.

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.

1.58 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.

1.59 Annex I is revoked except sections I.2, I.9 and I.10. For further information refer to Historical Steam Boiler Inspection Guideline on the TSSA website.

2.0. CSA B52

CSA B52-23 Mechanical refrigeration code is hereby adopted with the following amendments:

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

This Standard refers to the following publication, and where such reference is made, it shall be to the edition listed below:

CSA Group

B51:24
Boiler, pressure vessel, and pressure piping code

For the following publications, unless otherwise stipulated by the Director, a reference shall be to the latest edition but shall come into force and effect six months after the date of 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 Code

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)

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

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

2.2. Clause 3.1 is amended by adding the following definitions:

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)*

2.3. Clause 5.1.3 is amended by adding following 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 Boad of Boiler and Pressure Vessels Inspectors do not require submission to TSSA.

2.4. Note to Clause 5.3.1 is amended by adding the to the end of the existing clause:

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

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

2.5. Clause 5.6.1.2 is revoked and substituted with the following:

Stress corrosion cracking

Pressure 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.

2.6. Clause 5.7.1 is revoked and substituted with the following:

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 700 psi or less, registered in accordance with CSA B51 and 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.

2.7. Clause 5.7.3 is revoked and substituted with the following:

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, and

   i) for qualification of the pressure-temperature rating, a minimum of 3 times pressure test as per ASME B31.5 is permitted;

   ii) or certified to UL 207;

or

b) part of a refrigeration system that complies with the requirements of Clause 5.2.

2.8. 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.

2.9 Clause 5.10.4.4 is amended by adding the following 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 made with a Technical Standards and Safety Authority inspector including written confirmation of such arrangement from the Technical Standards and Safety Authority.

2.10. 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 including written confirmation of such arrangement from the Technical Standards and Safety Authority.

2.11. Clause 5.12 is amended by adding the following after clause (a):

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

2.12. Clause 5.13 is amended by revoking item d) and replacing 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.

2.13. 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^2 for each door that opens into the vestibule but not less than 0.4 m^2, or

(B) mechanically at a rate of 14 m^3/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.

2.14. 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 Safety Code*, Part I.

2.15. Clause 7.1.1 is amended by adding the following to the end of the existing clause:

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.

2.16. Clause 7.3.6.1.3 is amended by adding the following after clause (c):

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

2.17. 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

2.18. Clause 8.4.2 is amended by adding the following after item i):

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

2.19. 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 the Boilers and Pressure Vessels Code Adoption Document.

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.

2.20 Annex B is adopted as additional requirements and is mandatory.

3.0. CSA N285.0

CSA N285.0 *General requirements for pressure-retaining systems and components in CANDU nuclear power plants/Material Standards for reactor components for CANDU nuclear power plants* is hereby adopted. The applicable edition of this standard and any reference standards contained within are in accordance with the Certificate of Authorization, 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 or as listed in the License Conditions is used at the time of design and construction of an item.

4.0. Shop, Piping and First/Installation Inspections

4.1. The inspection of a boiler or pressure vessel (shop inspection) or of piping (piping inspection) shall be conducted by a Technical Standards and Safety Authority inspector at any stage of its manufacture or installation as per 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.

Alternately, eligible piping systems can be inspected by the Competent Person under the Technical Standards and Safety Authority Alternate Process for Pressure Piping Inspection in Ontario.

Additional notes to CAD Amendment:
Refer to O. Reg. 220/01, s. 9 (1) inspection requirements for equipment during the manufacturing process. For Alternate piping inspection, see BPV Advisory on Alternate Process for Pressure Piping Inspection in Ontario, which allows eligible piping contractors to inspect eligible piping systems and complete a "Alternate Piping Data Form" as an alternative to a TSSA inspection.

4.2. An inspection report, which permits the operation of a boiler or pressure vessel for a limited time until a Certificate of Inspection is issued, shall be issued by a Technical Standards and Safety Authority Inspector, after a first inspection 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 or Alternate Piping Data Form and does not require renewal.

Additional notes to CAD:
Refer to O. Reg.220/01, section 5(1) requires that every owner or operator of a boiler, pressure vessel, piping and fitting shall have a certificate of inspection.

4.4. Inspections of fittings shall be included in all boiler, pressure vessel and 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 Code Adoption Document below for mandatory renewals of certificates, mandatory periodic inspections and exemptions.

5.0 Periodic Inspections and Renewing Certificates of Inspection

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

(a) Refrigerant pressure vessels and refrigerant receivers, except where the refrigerant is ammonia.

(b) Blowdown tanks.

(c) Water to water heat exchangers.

(d) 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^3

Additional notes to CAD Amendment:
Certificates of Inspection issued to boilers and pressure vessels listed in Sections 5.1(a)-(d) above do not require renewal.

5.2 Every owner or operator of a boiler, pressure vessel, or hydrogen electrolyzer regardless of size, 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
F	Hydrogen Electrolyzer	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, insurer or other person

accepted to perform periodic inspection. 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, unexpired date stamp 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.

The owner or operator should validate the Record of Inspection issued by TSSA on the TSSA website.

Additional notes to CAD Amendment:

a. *Refer to O. Reg. 220/01, section 10.1(3), which requires that 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.*

b. *Records of inspection (ROI) submitted by the insurer, third party inspection provider or other organization acceptable 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, third party inspection provider or other organization acceptable to TSSA. 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*

c. *Owners and operators are not permitted to operate boilers or pressure vessels without a current certificate of inspection (as per section 5(1) of O. Reg. 220/01). 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 Records of Inspection

5.4.1 Inspection Report

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

Director's Order BPV-25-02 categorizes 20 violations into two groups: High-Risk and Other Reportable Violations. When any of these violations are identified during a periodic inspection, the Record of Inspection (ROI) shall be submitted by the insurer to TSSA individually using the BPV Certificate of Inspection (COI) portal.

High-Risk Violations require immediate compliance, and a COI will not be issued until the violation is resolved and an ROI indicating that the violation has been resolved is submitted by the insurer to TSSA using the BPV COI Portal.

Other Reportable Violations must be resolved within the timeframe specified by the insurer, but no later than 90 days from the issue date. Other Reportable Violations that remain unresolved after 90 days are then deemed to be High-Risk Violations which render the device ineligible for a COI and will result in the device being shut down at the next renewal cycle.

Reporting violations through the BPV COI Portal satisfies the regulatory requirement of reporting "unacceptable conditions" under s. 11 of O. Reg 220/01 if completed within a reasonable time.

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, insurer or third-party inspection provider conducting the required periodic inspection of the equipment listed in section 5.2, above, shall issue a record of inspection (ROI) for each boiler or pressure vessel to the owner or operator and to the Technical Standards and Safety Authority within 30 days of the inspection date.

A 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 contact name
iv. Installation Address
v. Owner / Operator email address
vi. Owner / Operator telephone number
vii. Site name
viii. Insurer or third party inspection provider name
ix. Insurer inspector email address *
x. "Inspected on behalf of (Insurer Name)" where applicable
xi. Inspection date
xii. Inspection type (internal /external)
xiii. The Technical Standards and Safety Authority issued Ontario Certificate of Competency number
xiv. Inspection status
xv. Maximum Allowable Working Pressure (MAWP)
xvi. Any reportable violations (if applicable)
xvii. Serial Number *
xviii. OIN *
xix. CRN
xx. National Board Number *
xxi. Customer Reference Number (if applicable) *

Additional notes to CAD Amendment:
a. ROI technical data is embedded 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 a 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.

d. Items marked with an asterisk (*) are non mandatory fields on the ROI

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 boiler or pressure vessel for which a Certificate of Inspection has been issued within 10 calendar days of the change occurring:

a. Removal from service (using the 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 forthwith where the insurer has cancelled, suspended or not renewed the insurance or for any other reason insurance to equipment is not in place.

5.5.3 Notification Information

A notification to the Technical Standards and Safety Authority under sections 5.5.1 or 5.5.2 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

6.2 In this section, “direct expansion coils” means the piping in which liquid refrigerant is vaporized to produce ice in a rink for hockey, skating or curling.

6.3 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 shall be located away from any opening for a door, window or air-inlet of the rink or of any adjacent building:

i. at a sufficient distance such that discharged refrigerant fumes would not enter the rink or buildings, and

ii. not less that fifteen feet above any such openings.

6.4 The expansion coils shall be protected by dual relief valves set to function at a pressure of 75 psig.

6.5 The high-pressure side of the compressor shall be equipped with magnetically operated stop-valves that are energized and opened only when the motor driving the compressor is itself energized.

6.6 The expansion coils shall be supported on solid foundations throughout their length.

6.7 The refrigerant shall be completely purged from the expansion coils while the rink is regularly being used for any purpose other than hockey, skating or curling.

7.0 Welder/Welding Operator and Brazer/Brazing Operator Authorization

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 who have used the specific welding or brazing process at least every six (6) months and whose employer has 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 or medical gas piping whol have used the specific brazing process at least every six (6) months and whose employer has 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

8.1 Examinations Required for a New or Reinstated Ontario Certificate of Competency

Persons who apply for an Ontario Certificate of Competency must 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). The Director may permit substitution of one or both of the above examinations with other certifications and examinations acceptable to the Director.

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 apply for an Ontario Certificate of Competency must have:

(a) 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); or

(b) As an alternative to paragraph (a), candidates qualified under NB-380 program can also apply for recognition of qualification. 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.

The Director may also accept other certifications and examinations acceptable to the Director.

Additional notes to CAD Amendment:
Refer to O.Reg.220/01 Section 12(4)(c).

8.3 Applications for an Ontario Certificate of Competency

Applicants 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) or other certifications and examinations acceptable to the Director. 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 or completing training and continued education described in QA manual acceptable to TSSA.

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, Third-Party and other Inspection Providers

9.1 Application for a Certificate of Authorization for Third Party Inspection Providers and other 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, or other Certificate acceptable to TSSA;
c. A list of persons who will conduct inspections with valid Ontario Certificates of Competency;
d. Copy of current Quality Control Manual including 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 licensed to underwrite insurance for equipment listed in section 5.2 above but who did not submit any Records of Inspection to the Technical Standards and Safety Authority shall submit a statement to the Technical Standards and Safety Authority by the 30th day of September of each and every year attesting to the following:

(a) That during the previous 12 months, as calculated from the 1st day of July of the preceding year to the 30th 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

Code Adoption Document and is certified to be true and accurate; or

(b) That during the previous 12 months, as calculated from the 1st of July of the preceding year to the 30th of June of the current year, they did not actively underwrite insurance for any equipment listed in 5.2 above.

Note: 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 Code Adoption Document.

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 Regulator Authority 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 [ ]

Signed on this [ ]

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