



Fuels Safety Division	Ref. No.: FS-200-12	Rev. No.:
Gaseous Fuels Code Adoption Document Amendment	Date: October 1, 2012	Date:

IN THE MATTER OF:

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

- and -

ONTARIO REGULATION 223/01
(Codes and Standards Adopted by Reference) made under the Act

- and -

ONTARIO REGULATION 212/01 (Gaseous Fuels) made under the Act

Subject: Adoption of the CSA B149.1-10 Natural Gas and Propane Installation Code with Ontario Amendments and Adoption of the of the TSSA-FA-2012 Field Approval Code and Adoption of the CAN/BNQ 1784-000/2007 Canadian Hydrogen Installation Code with Ontario Amendments and Adoption of the TSSA-DLB-2012 Digester, Landfill and Biogas Approval Code

The Director of Ontario Regulation 212/01 (Gaseous Fuels), pursuant to section 6 of Ontario Regulation 223/01 (Codes and Standards Adopted by Reference), hereby provides notice that the Gaseous Fuels Code Adoption Document dated June 1, 2001 (CAD), as amended, published by the Technical Standards & Safety Authority is further amended as follows;

All sections of the Gaseous Fuels Code Adoption Document are revoked and replaced with the following:

1. The National Standard of Canada CSA-B149.1-10 entitled "NATURAL GAS AND PROPANE INSTALLATION CODE" prepared by the Canadian Standards Association is adopted with the following amendments:

1.2 Section 1.2 is amended by adding to it the following sub-clause:
(m) propane used as refrigerant.

1.3 Section 2 is amended by:

a) Adding the CSA 6.18-02 Service Regulators for Natural Gas Standard; and

b) Revoking the reference to 6.19-01 Residential Carbon Monoxide Alarming Devices and replacing it with CAN/CSA-6.19-01 Residential Carbon Monoxide Alarming Devices.

1.4 Section 3 is amended by revoking the definitions of "Appliance" and "Approved" and replacing the definitions with the definitions provided in Ontario Regulation 212/01 (Gaseous Fuels).

1.5 Section 3 is amended by revoking the definition of "Authority having jurisdiction" and replacing it as follows:

Authority having jurisdiction: means the Director designated for the purposes of the Act.

1.6 Section 3 is amended by revoking the definition of “boiler” and replacing it as follows:

Boiler — an appliance intended to supply hot liquid or vapour for space-heating, processing, or power purposes and does not include appliances certified as water heaters.

1.7 Clause 4.1.4 is revoked and the following substituted for it:

4.1.4 Where a conflict exists between the manufacturer’s certified installation instructions and this Code, the most stringent of the two shall prevail.

1.8 Clause 4.2.3 is revoked and the following is substituted for it:

4.2.3 The approval of the assembly or construction of an appliance is subject to the authority having jurisdiction and shall comply with Section 2 of this Code Adoption Document.

1.9 Clause 4.3.5 (a) is revoked and the following is substituted for it:

4.3.5 When the installation or conversion of an appliance constitutes a conversion from another form of energy the installer shall, at the time of installation or conversion,

- (a) in the case of a fuel oil tank,
 - (i) remove the fill pipe and cap or plug the exposed fill pipe opening to an inside tank; however, do not remove the tank vent pipe .
 - (ii) shut off the tank outlet valve, remove the filter, and plug or cap the valve outlet;
 - (iii) where the tank is located outdoors, disconnect all exposed piping or tubing as close as practicable to the tank; cap or plug the exposed fill pipe opening to the tank; however, do not remove the tank vent pipe and
 - (iv) advise the owner/operator of the tank in writing that the tank may be required to be removed in accordance with the Fuel Oil Regulation and the oil shall be removed by a certificate holder trained for the purpose.

1.10 Clause 4.5.5 is revoked and the following is substituted for it:

4.5.5 An appliance that has been exposed to fire, explosion, flood, or other damage shall not be offered for sale, installed, re-activated or reconnected to the supply, without:

- (a) approval of the authority having jurisdiction; or
- (b) inspection and confirmation by a Gas Technician I or II (as appropriate for the appliance input rating) that it is fit for continued use.

1.11 Clause 4.7.3 is revoked and the following substituted for it:

4.7.3 All interior metal gas piping that may become energized shall be made electrically continuous and shall be bonded in accordance with the requirements mandated by the Electrical Safety Authority.

Note: Refer to ESA Bulletin 10-14-2 and subsequent amendments

1.12 Clause 4.16.4 is revoked and the following substituted for it:

4.16.4 Where a forced air appliance for heating of the attached residential building is installed in a residential garage, no opening shall be located in the portion of the appliance return air system located within the garage and the return air system shall be made air tight to prevent the infiltration of air from inside the garage.

1.13 Section 4 is amended by adding to it the following sub-section:

4.25 Mandatory Safety Checks for Residential (one or two family Dwelling) Natural Draft Boilers Equipped With Draft Hoods 300,000 BTU's or Less.

4.25.1 During each heating season effective October 15 to April 30th when a certified G1, G2, G3 or GUT gas technician enters a residential building intended for one or two single families to carry out service, maintenance and/or emergency response work within the scope of his/her certificate, the gas technician shall:

1. Determine if a natural draft boiler equipped with a draft control device and with an input less than 300,000 BTUH is installed in the building. Where such a boiler is installed, the gas technician shall take the following steps unless a valid boiler inspection label as identified in paragraphs (e) and (f) is affixed to the boiler.
 - (a) The gas technician shall provide the homeowner/user with the Owner/User Information Sheet (Annex "M" Schedule A) that outlines the technician's requirement to inspect and take corrective action where necessary and the homeowner's responsibility to properly maintain their fuel burning equipment.
 - (b) The gas technician shall take a CO reading in the flue gas upstream of the draft control device (between the heat exchanger and the draft hood) with the boiler operating at steady state under normal operating conditions. If the CO reading exceeds 100 PPM, the boiler shall be considered an immediate hazard and the gas technician shall:
 - (i) Take immediate corrective action to address areas of concern including, but not limited to,
 - a. cleaning boiler flue passages and cleaning the burner. If the boiler operation cannot be corrected so that the reading is below 100 PPM, immediately shut off the fuel supply to the boiler, provide notice to the user and distributor and affix a notice to the boiler as outlined in subsection 13(2) and (3) of ONTARIO REGULATION 212/01 (Gaseous Fuels);
 - (c) The gas technician shall visually inspect the boiler for safe operation.
 - (a) If there are signs of spillage (such as discolouration on the burner door or near the draft control device, or excessive moisture in the boiler room), a depressurization test as outlined in Annex "M" Schedule C shall be performed. If the test demonstrates that there is a depressurization issue, then take appropriate action such as adding adequate combustion and make-up air.
 - (b) If there are signs of condensation due to excessively low return water temperatures, take appropriate action such as installing a water bypass piping system in accordance with manufacturer's requirements or recommendations.
 - (d) A carbon monoxide alarm certified to CSA-6.19 shall be installed in accordance with the carbon monoxide alarm's installation instructions and located in the sleeping area or adjacent to each sleeping area in every suite of the home.

- (e) If the boiler operation is satisfactory and found with a CO reading below 100 PPM, and the CO alarm(s) are installed, a boiler inspection tag (Annex "M" Schedule "B") shall be affixed to the boiler.
- (f) The boiler inspection tag affixed to the boiler shall expire on May 1st following the completion of this requirement

1.14 Section 5.1 is amended by adding to it the following clauses:

5.1.5 Any installation requiring pressures in excess of those specified in Table 5.1 shall be approved by the Director.

5.1.6 For natural gas only, outdoor installations exceeding 125 psig shall be approved by the Director.

1.15 Clause 5.5.9 is amended by adding a new column in Table 5.2 to read:

"The discharge clearances from relief device openings with capacities under 50 cf/h (1.5 m³/h) will be 1 ft. (.3 m) to a building opening, appliance vent outlet, appliance air intake or source of ignition, and 3 ft. (1 m) to a mechanical air intake".

1.16 Clause 6.2.3 is revoked and the following substituted:

6.2.3 Natural gas piping or propane vapour phase piping with operating pressures up to and including 125 psig (860kPa) shall be at least standard weight.

1.17 Table 6.3 Note (2) is revoked and the following substituted:

(2) Wrapped and or factory-coated piping or tubing of all sizes and lengths, other than Corrugated Stainless Steel Tubing (CSST) and coated copper tubing, shall be tested at a minimum pressure of 100 psig (700 kPa) in accordance with the time duration on the table. CSST and coated copper tubing shall be tested in accordance to the requirements of the main body of Table 6.3.

1.18 Clause 6.7.2 is amended by adding a note at the end of the clause to read:

Note: The concealed space resulting from installation of a metal liner in a chimney, which has been examined and found to be clear and free of soot and creosote, may be used to install one continuous length of non-coated piping or tubing.

1.19 Clause 6.15.4 is revoked and the following substituted for:

6.15.4 Piping and tubing shall be located;

- (a) Neither less than 15 in (400 mm) underground nor less 24 in (600 mm) under a commercial driveway or parking lot, except when it raises above ground at the point of supply to either a building or an outdoor appliance. Additional depth of cover shall be required where the piping is located in areas where physical damage is likely to occur, such as farm operations.
- b) Where, due to rocky terrain, it is impractical to comply with section 6.15.4 (a), piping and tubing systems may be installed in accordance with **Annex L**.

1.20 Clause 6.18.3 is revoked and the following substituted for:

6.18.3.1 The requirements that for each appliance, an individual manual shut-off **valve be installed as** specified in Clause 6.18.2 may be waived when a **readily accessible** single manual shut-off **valve** is;

- (a) installed for **commercial cooking appliances** manifolded in line; or
- (b) installed in common supply piping to more than one **direct-vent** room heater that is part of a heating system in a **dwelling unit**, provided that it is less than 50 ft (17 m) away from each **appliance**.

6.18.3.2 The requirement for a manual shut-off **valve** specified in Clause 6.18.2 (b) to be **readily accessible** may be waived when it is located;

- (a) behind a residential gas range; and/or
- (b) behind a residential gas clothes dryer.

1.21 Clauses 6.22.2, 6.22.3 and 6.22.4 are revoked and the following substituted for it:

6.22.2 Before appliances are connected to a new piping and tubing system containing fittings or joints, a pressure test shall be applied using either air or an inert gas (e.g. nitrogen) in the following manner:

- (a) Appliance shut-off valves meters, regulators and any component not rated for the test pressure being applied, shall not be connected to the piping or tubing system under test.
- (b) The test pressure shall be measured by either a pressure gauge or equivalent device and, if a gauge is used, the minimum diameter shall be 3 in (75 mm) and the maximum range shall exceed the test pressure by at least 15% but not more than 300%. The pressure gauge or equivalent device shall be calibrated to read in increments of not more than either 2 psig (14 kPa) or 2% of the maximum dial reading of the pressure gauge, whichever is less.
- (c) A pressure recorder when used for this test shall have a maximum range and be calibrated to the requirements of sub-section (b).
- (d) The pressure and duration of the test shall be in accordance with Table 6.3.

6.22.3 After an appliance(s) is connected, the new system shall be tested in the following manner:

- (a) Before turning on the gas for the test, a check shall be made to ensure that any opening from which gas can escape is closed.
- (b) Immediately after allowing the gas into the piping or tubing system, a test shall be made to determine that no gas is escaping by carefully watching the lowest volume test dial of the meter
- (c) Where a meter is not provided, a working pressure isolated system (supply shut off) test shall be completed and the pressure shall be measured with either a pressure gauge or equivalent device calibrated to read in increments not greater than those specified in Clause 6.22.2(b), with the following exceptions:
 - (i) for a system where the working pressure is 0.5 psig (3.5 kPa) or less, the pressure gauge or equivalent device (e.g. a manometer) shall be calibrated to read in increments of not greater than 1 in w.c. (250 Pa); and
 - (ii) for a system where the working pressure exceeds 0.5 psig (3.5 kPa) but does not exceed 5 psig (35 kPa), the pressure gauge or equivalent device shall be calibrated to read in increments of not greater than 2 in w.c. of pressure (0.5 kPa); and
 - (iii) For this test the gas supply shall be shut off and the contained gas pressure shall be monitored for leakage indicated by a pressure drop.
- (d) The test described in subsections (b) and (c) shall be of a 10 minute duration.

- (e) Each appliance connection, valve, valve train, and system component shall be checked while under normal operating pressure with either a liquid solution or a leak-detection device to locate any source of a leak.

6.22.4 Piping/Tubing Addition or Appliance Connection to Existing Piping/Tubing

6.22.4.1 An addition to an existing piping or tubing system shall be tested as an individual system in accordance with Clause 6.22, except that:

- (a) where the addition is:
 - (i) 20 ft (6 m) or less in length, or
 - (ii) one continuous length of piping or tubing not containing fittings and the normal working pressure is less than 0.5 psig (3.5 kPa), the addition shall be leak tested in accordance with Clause 6.22.3(e); and
- (b) where the addition is accomplished using a welded tie-in, and the new system has been tested in compliance with Clause 6.22, the tie-in weld shall be tested in accordance with Clause 6.22.3(e).

6.22.4.2 A replacement appliance connection to an existing piping or tubing system where the normal working pressure is less than 0.5 psig (3.5 kPa) shall be leak tested in accordance with Clause 6.22.3(e).

1.22 Section 6.22 is amended by adding to it the following clause:

6.22.6 When the pressure test in 6.22.2 or the leak test in 6.22.4 is completed, a tag stating the following information shall be attached to the piping, tubing system or an appliance in a readily accessible location protected from the environment:

- (i) Address of test;
- (ii) Contractor's name
- (iii) Contractor's registration number
- (iv) Date of test
- (v) Test pressure
- (vi) Test duration
- (vii) Total pipe length
- (viii) Pipe size
- (ix) Gas Technician name
- (x) Gas Technician certificate number and classification
- (xi) Statement: "DO NOT REMOVE"

1.23 Section 7.1 is amended by adding the following clauses to it:

7.1.4 A boiler not covered under 7.1.1 shall conform to the requirements of clauses 7.1.5, 7.1.6, 7.1.7 and 7.1.8 as applicable.

7.1.5 Every steam boiler not under continuous attendance by a certified operator shall be equipped with a low-water fuel cut-off device that serves no other purpose, that cannot be rendered inoperative and can be tested under operational conditions

7.1.6 Except as permitted under clauses 7.1.7 and 7.1.8 every automatically fired hot-water heating boiler shall be equipped with a low-water cut-off device to shut off the fuel supply in the event of low water when,

- (a) the input to the boiler is in excess of 120 kW (400,000 Btuh); or
- (b) portions of the circulating system are located below the boiler's lowest safe permissible water level regardless of the input, and the sensing element of the device shall be located above the lowest safe permissible water level established by the boiler manufacturer.

7.1.7 The circulation system indicated in 7.1.6 (b) does not include;

- (a) Piping, headers and components required for the bottom connections of the boiler and piping within 6 feet (2M) of the boiler, or;
- (b) Residential Combo Fan Coil units or in-floor heating applications and all connecting piping and required components, and;
- (c) Boilers not requiring Low Water Cut Off devices by meeting the exemption requirements of 7.1.7 (a) or (b) shall be equipped with a flow-sensing device installed integral to the Boiler. The function of the device shall be to shut off the fuel supply when the circulating flow is interrupted.

7.1.8 A coil-type boiler or a water tube boiler having an input in excess of 120 kW (400,000 Btuh) requiring forced circulation to prevent overheating of the coils or tubes, shall be equipped with a flow-sensing device installed integral to the unit or within the outlet piping in place of the low water fuel cut-off device required in sub clause 7.1.6 (a), and the sole function of the device shall be to shut off the fuel supply when the circulating flow is interrupted.

7.1.9 When two or more hot water boilers of the coil or fin-tube type are installed in one system, a low water fuel cut off device shall not be required on each boiler, provided that a low water cut-off device is installed on the main water outlet header and a flow switch is installed integral to the unit or within the output piping of each boiler that will cut off the fuel supply to the burner on the boiler. These devices shall be installed so that they cannot be rendered inoperative. The installation of low-water cut-offs shall be such that they can be tested under operating conditions.

Note: The term "tested under operating conditions" is a procedure that ensures closure of the fuel supply valves in response to a simulated low water condition.

7.1.10 The pressure **relief device** on a Boiler 400,000 Btu/hr or less shall have a discharge pipe of a size at least equal to the nominal size of the device outlet. The discharge pipe shall terminate not more than 12 in (300 mm) above the floor.

1.24 Clause 7.18.2 is revoked and the following substituted for:

7.18.2 A **construction heater** shall be installed in accordance with the manufacturer's **certified** installation instructions.

1.25 Clause 7.18.10 is amended by deleting the word propane, to read:

7.18.10 A torch intended for manual operation shall not be left unattended while in operation.

1.26 Clause 7.25.7 is revoked and the following is substituted for it:

7.25.7 When an existing indoor swimming gas-fired pool heater is being replaced with a new gas heater, the new finned tube type heater shall be of the direct vent type.

1.27 Clause 7.26.1 is revoked and the following substituted for:

7.26.1 A water heater, unless of the direct-vent type, shall not be installed in a bathroom, bedroom, or any enclosure where sleeping accommodation is provided.

A power vent water heater may be installed in an enclosure adjacent to a bedroom or bathroom provided adequate combustion air per clause 8.2.6 is provided to the enclosure. This combustion air supply shall not be supplied from the bedroom or bathroom.

A natural draft water heater may be installed in an enclosure that is accessed by a pedestrian door which can be opened from a bathroom or bedroom, provided that the enclosure has a volume equal to or greater than the bathroom or bedroom

1.28 Clause 7.26.7 is revoked and the following substituted for:

7.26.7 Except for **direct-vent** water heaters, when the water heater is used in a combo heating system, return-air inlets shall not be installed in the same enclosure that contains both an air handling unit and the water heater. Adequate combustion air shall be provided for the water heater.

1.29 Section 7.26 is amended by adding to it the following clause:

7.26.9 A water heater shall be installed:

- (a) If of the storage type, in a level manner on a firm and stable base sufficient to bear its expected in-service weight; and
- (b) if of the wall hung type, secured on a wall in a manner suitable to support its filled weight.

1.30 Clause 7.32.5 is revoked

1.31 Clause 7.33.3 is revoked and the following substituted for:

7.33.3 All Un-Vented Servel Refrigerators built between 1933 and 1957, ("Un-Vented Servel Refrigerators(s)") installed within any premises or any part of a premises that is a dwelling, mobile home, recreation vehicle or other living space shall:

- (a) be removed and safely rendered inoperable for any future use or removed and relocated to an area that is isolated from the living space.
- (b) have a warning label, protected from the environment, that is either affixed to the outside of the front door or inside the Un-Vented Servel Refrigerator in a location that is readily visible. The warning label shall have the following wording:

W A R N I N G

This refrigerator is prone to the production of Carbon Monoxide in levels that may be lethal. This refrigerator may only be operated in an area that is isolated from a living space such as: a remote shed, garage or open porch. The refrigerator shall be located a minimum distance of 12 inches from any opening to the living space.

The word "WARNING" shall be a minimum of ¼-inch (6.4 mm) in height. All other words on the label shall be a minimum 1/8-inch (3.2 mm) in height.

- (c) be inspected and serviced by an appropriate certificate holder annually.

1.32 Section 7 is amended by adding to it the following clauses:

7.34 Field Approval of Special Effects

Natural gas or propane used in connection with **Field Approval of Special Effects** shall comply with **Annex K**.

7.35 Requirements for the operation of Appliances at shows, exhibitions, or other similar events. Natural gas or propane used in connection to **Appliances and Cylinders at Shows, Exhibitions, or other Similar Events** shall comply with **Annex J**.

1.33 Clause 8.1.2 is revoked and the following substituted:

8.1.2 The requirements of 8.2 through 8.5 inclusive do not apply to:

- (a) direct-vent appliances, or
- (b) Category IV appliances unless installed in designated R-2000 homes or in an enclosure.

1.34 Sub-clause 8.2.1 (a) is revoked and the following is substituted for it:

8.2.1 (a) has a vapour or air barrier with joints continuously sealed by taping or caulking in all thermally insulated walls, ceilings and floors; or

1.35 Clause 8.9.5 is revoked and the following is substituted for it:

8.9.5 Venting systems or total vent run if less than 3 ft (900 mm), that employ plastic vents shall be installed such that the first 3 ft (900 mm) from the appliance outlet is readily accessible for visual inspection except for direct vent appliances such as fireplaces that are intended to have short vent lengths to be concealed for decorative purposes.

1.36 Clause 8.10.13 is revoked and the following is substituted for it:

8.10.13 A false ceiling space, or a concealed space used for return air, shall not contain a vent or vent connector that does not have sealed joints or seams.

1.37 Clause 8.12.2 is revoked and the following substituted:

8.12.2 Except as provided in Clause 8.21.6, before replacing an existing **appliance** or connecting a **vent connector** to a **chimney**, the **chimney flue** shall be examined to ascertain that the **chimney**:

- (a) is properly constructed;
- (b) is lined with a tile or metal liner;
 - i. if installation of a liner is required it shall be completed within 5 days for residential applications and 30 days for commercial application of replacing the existing appliance
 - ii. a tile liner is not acceptable for an exterior chimney, it shall be relined with a certified metal liner.
- (c) is clear and free of soot, creosote, or obstructions;
- (d) will effectively conduct the **products of combustion** outdoors; and
- (e) is sized in accordance with Clause 8.13.

1.38 Clause 8.13.1 is revoked and the following substituted:

8.13.1 A **vent** or a **chimney** serving a single **appliance** shall provide effective venting and shall be sized;

- (a) for a single appliance with draft hood the effective area of the vent connector or and chimney flue is not less than the area of draft hood outlet, or greater than seven times the draft hood outlet area

- (b) in accordance with good engineering practice, such as by the use of
 - (i) Table C.1, C.2, C.5, or C.6 of Annex C for a *draft-hood*-equipped or a fan-assisted *Category I appliance*. or
 - (ii) engineering methods acceptable to the *authority having jurisdiction*;

1.39 Clause 8.13.2 is revoked and the following substituted:

8.13.2 A *vent* or a *chimney* serving more than one *appliance* shall provide effective venting and shall be sized;

- (a) for two appliances with draft hoods the effective chimney flue area is not less than that three largest draft hood outlet plus 50% of the smaller draft hood outlet area, or greater than seven times the smaller draft hood outlet area
- (b) in accordance with good engineering practice, such as by the use of
 - (i) Table C.3, C.4, C.7, or C.8 of Annex C for a *draft-hood*-equipped or a fan-assisted *Category I appliance*, or
 - (ii) engineering methods acceptable to the *authority having jurisdiction*

1.40 Sub items 8.18.12 a) (i) and (ii) are amended by adding "see clause 7.13.4" after the words "Floor Furnace".

1.41 Annex C is amended by adding to it the following:

C.2.17 For Single Appliance Venting Applications:

Where the vertical vent has a larger diameter than the vent connector, the vertical vent diameter shall be used to determine the minimum vent capacity and the vent connector diameter shall be used to determine the maximum vent capacity. The flow area of the vertical vent shall not exceed 7 times the flow area of the listed appliance categorized vent area, flue collar area, or draft hood outlet area unless designed with approved engineering methods.

For Multiple Appliances Venting Applications:

Where 2 or more appliances are connected to a vertical vent or chimney the flow area of the largest section of vertical vent or chimney shall not exceed 7 times the flow area of smallest listed appliance categorized vent area, flue collar area, or draft hood outlet area unless designed with approved engineering methods.

1.42 Annex D is revoked.

2. The TSSA Field Approval Code, TSSA-FA-2012 is adopted for the approval of assembly or construction of an appliance.

3. The National Standard of Canada CAN/BNQ 1784-000/2007 entitled "Canadian Hydrogen Installation Code", prepared by the Bureau de normalization du Quebec is adopted for the installation of hydrogen fuelled appliances and equipment with the following amendment:

3.1 Clause 7.4.1.2 is revoked and the following is substituted for it:

7.4.1.2 Hydrogen piping, tubing and fittings shall be designed and installed in accordance with the appropriate requirements of ASME Standard B31.3 and shall be approved by the director.

4. The TSSA Digester, Landfill and Biogas Approval Code, TSSA-DLB-2012 is hereby adopted.

5. The terms incorporated in this Document have the same meaning as in the Act and the Regulation, unless otherwise specified.

6. In the event of conflict between a provision of this Document and any code or standard referred to in this document, this document shall prevail..

7. This CAD is in effect on December 1, 2012.

Any person involved in an activity, process or procedure to which this document applies shall comply with this document.

DATED at Toronto this 1st. day of October, 2012



John Marshall

Director, Ontario Regulation 212/01 (Gaseous Fuels), appointed under the *Technical Standards and Safety Act, 2000*

This document has been developed in consultation with the Natural Gas Advisory Council and the Natural Gas Risk Reduction Group.

ANNEX J

REQUIREMENTS FOR OPERATION OF APPLIANCES AND CYLINDERS AT SHOWS, EXHIBITIONS, OR OTHER SIMILAR EVENTS

Use of Appliances

1. This Appendix applies to **appliances** that
 - (a) are on display at shows, exhibitions or other similar events; and
 - (b) are designed to be used outdoors or vented to the outdoors.
2. An **appliance** may be operated and vented indoors if it meets the requirements of this Annex;
3. An **appliance** shall only be used for the purpose of demonstrating its operation but shall not be used for heating space, water, or any other thing or for any other purpose.
4. An **appliance approved** for outdoor use being operated indoors for the purpose of demonstration shall be clearly marked that this appliance is for outdoor use only and the sign shall read:

DANGER

THE USE OF THIS TYPE OF APPLIANCE IS PROHIBITED FOR INDOOR USE. FOR YOUR SAFETY THE UNIT YOU ARE VIEWING IN THIS DISPLAY IS CONSTANTLY MONITORED FOR THE PRESENCE OF CARBON MONOXIDE. TO PROTECT YOU AND YOUR FAMILY NEVER USE A (name of the appliance i.e. BBQ, Patio Heater, Fire Pit, etc.) INDOORS, INCLUDING A GARAGE.

The sign shall be located immediately adjacent to the appliance and in clear view of the public, and the letters shall be a minimum 1" high.

5. An **appliance** shall be installed and activated initially by a person holding an appropriate valid certificate under the Technical Standards and Safety Act.
6. A person who has knowledge of the manufacturer's operating instructions for the **appliance** shall be in constant and immediate control of the operation of the **appliance**. A copy of the manufacturer's instructions shall be left with the **appliance**.
7. An **appliance** shall be **approved**.
8. (1) The level of carbon monoxide in the vicinity of an **appliance** shall
 - (a) be measured at intervals not exceeding 3 hrs,
 - (b) be measured 4 ft (1.2 m) above the floor and 4 ft (1.2 m) horizontally from the **appliance**, and
 - (c) be recorded with the date and time the measurements were made.
- (2) The record of levels of carbon monoxide made under sub – item 8 (1) shall be kept

where the **appliance** is displayed and for the entire period of its display.

9. An **appliance** shall be shut down if the carbon monoxide level determined under item 8 exceeds 25 ppm.
10. A means shall be provided to physically protect any person from contact with hot surfaces, hot gases or flames resulting from operation of an **appliance**.
11. A **certified** portable fire extinguisher classified in accordance with ULC Standard CAN4-S508 of not less than 10-B,C rating shall be located at each booth or stall displaying **appliances**.
12. **Use of Propane Cylinders Indoors**
 - 12.1 A **cylinder** shall be labeled "Propane", "Liquid Petroleum (LP) Gas" or "Danger: flammable gas". This label shall be easily readable and affixed in a conspicuous location.
 - 12.2 A **cylinder** containing a maximum of 20 Lbs (9 kg) of propane and not connected to any other **cylinder** may be used indoors to supply propane to an **appliance**. The total propane capacity of **cylinders** installed indoors shall not exceed 1 Lbs (0.5 kg) per 200 square feet (18 square meters) of floor area.
 - 12.3 A **cylinder** in use within a **building** shall not be located within 50 ft (15 m) of an exit or stairway.
 - 12.4 A **cylinder** valve connection shall be equipped with an excess flow valve that activates at a flow of not more than 100 scfh (2.8 m³/h) at a pressure of 100 psig (690 kPa) or a device that limits the flow equivalent to that through a No. 60 DMS (1 mm) drill orifice at 100 psig (690 kPa). A cylinder shall be equipped with an overfill protection device (OPD) valve.
 - 12.5 A **certified pressure regulator** shall be installed on a **cylinder** and be suitable for use with the **appliance** connected to the **cylinder**.
 - 12.6 A **cylinder** valve shall be closed when the **appliance** connected to the **cylinder** is not in use.
 - 12.7 A **cylinder** connected to an **appliance** shall be secured or located in a place to prevent accidental tip over.
 - 12.8 A **certified** portable fire extinguisher classified in accordance with ULC Standard CAN4-S508 of at least 10-B.C rating shall be located within 25 ft (7.5m) of a **cylinder**.
 - 12.9 A **cylinder** not connected for use shall be stored outdoors.
 - 12.10 Connections at a **cylinder** and at the **appliance** connected to the **cylinder** shall be tested for leaks with a leak detection solution or any other proven leak detection method at the time the **cylinder** is connected. Additionally, this test shall be conducted daily upon activation. A source of **ignition** shall not be used to check for leaks.

NOTES FOR ANNEX J

1. Other applicable requirements of this Code shall apply

2. Other authorities such as the local fire department may have additional requirements that apply.

Annex K Field Approval of Special Effects

The standard, NFPA 160, "Standard for Flame Effects Before an Audience, 2001 Edition" is adopted for use in the province of Ontario with the following amendments:

1. Section 1.1 is revoked and replaced with the following:

1.1.1 This standard shall apply to temporary flame effects using propane or natural gas as the fuel for entertainment, exhibition, demonstration, or simulation, including their design, fabrication, installation, testing, control, operation and maintenance.

- 1.1.2 This standard shall apply to the following:

- (a) The use of indoor and outdoor flame effects;
- (b) The design, fabrication, installation, testing, control, operation and maintenance of equipment, materials, procedures, and systems used to produce flame effects;
- (c) The rehearsal, videotaping, audiotaping, or filming of any television, radio, or movie production if such production includes the use of flame effects;
- (d) The rehearsal of any production incorporating flame effects.

2. Section 1.4 is amended by adding the following definition:

Deadperson switch. A manually controlled system designed to automatically interrupt the fuel to the flame effect equipment.

3. Section 6.4 is revoked and the following substituted for it:

6.4 All flame effect operators shall have a valid Record of Training (R.O.T.) for the use and handling of natural gas or propane construction heaters or equivalent.

4. Section 7.3.2.5 is revoked.

7.3.2.5 **Fireplace Kits**

Where the special effect is to simulate a flame in a fireplace, the following requirements shall apply.

- (a) Where the flame effect is to be installed in an existing fireplace:
 - i) the chimney/vent shall be inspected and adequate draft through the chimney/vent to exhaust combustion products shall be confirmed;
 - ii) the fireplace enclosure shall comply with the Ontario Building Code or be certified by a recognized testing organization;
 - iii) combustible materials shall be shielded from open flames by using fire-rated materials; and
 - iv) except as specified in 7-3.2.6 (iv), a maximum capacity of 20 lbs. of propane for each fireplace kit may be used indoors;
 - v) with multiple fireplace kit installations, an aggregate capacity of more than 100 lbs of propane connected for use shall not be used indoors.
- (b) The burner and supports shall be made of non-combustible materials.

- (c) At least one portable dry chemical fire extinguisher of a total not less than 20-B,C rating shall be provided in a readily accessible location to the operator.
- (d) Piping or tubing shall not be exposed to high temperatures and flame impingement.
- (e) The flame effect shall be controlled by a regulator and a quarter turn manual safety shut-off valve.
- (f) Where the flame effect will continuously operate for longer than 10 minutes,
 - (i) an automatic safety shut-off valve controlled by a deadperson switch shall be installed in the fuel supply line to the burner; or
 - (ii) a quarter turn manual valve will be installed as an effect valve and another quarter turn manual valve controlling the fuel supply shall be installed at the fuel supply system. The fuel supply valve will be installed and controlled by a second operator and located not less than 10 feet from the effect valve and primary operator.
- (g) Where a cylinder is used indoors with a capacity in excess of 1 lb. of propane,
 - (i) except as provided in (ii) an excess flow valve shall be installed. The excess flow valve shall be either integral with the cylinder valve or in the connection to the cylinder valve outlet. In either case, it shall be installed in such a manner that undue strain will not cause breakage between the cylinder and the valve.
 - (ii) A deadperson switch shall be installed with an automatic safety shut-off valve where an excess flow valve is not installed.
- (h) Unless completely separated from the flame with a 2 hour fire rated shield, a cylinder shall not be located less than 10 feet from the flame effect.
- (i) When a hose is used, it shall be inspected before connection, not exceed 75 feet in length and shall be protected, by location or other means, from impact and excessive heat.
- (j) The operator shall remain in constant attendance at the safety shut-off valve during operation and have visual access to the flame effect at all times.
- (k) During non-operation times, the operator shall close the quarter turn manual shut-off valve and the cylinder or fuel supply valve.
- (l) Cylinders not in use shall be stored in accordance with the Ontario Propane Code.

7.3.2.6 Flame Bars and other Flame Effects.

Where the special effect is to simulate a flame the following shall apply.

- (a) Where the input to the flame effect is less than 400 000 BTUH,
 - (i) the requirements of section 7.3.2.5 (fireplace kits) shall apply.
 - (ii) A pressure indicator shall be installed downstream of the regulator;
 - (iii) The estimated height of the flame for a specified pressure, burner and pipe/tube size shall be tested and documented prior to installation and operation;
 - (iv) It is permissible not to install an excess flow valve provided an automatic shut-off valve controlled by a deadperson switch is installed.

- (b) Where the input to the flame effect is 400 000 BTUH or greater,
- (i) The system will be controlled by
 - two automatic safety shut-off valves piped in series, wired in parallel and activated by a deadperson switch shall be installed or;
 - a quarter turn manual valve will be installed as an effect valve and another quarter turn manual valve controlling the fuel supply will be installed at the fuel supply system. The fuel supply valve will be installed and manually controlled by a second operator and located not less than 10 feet from the effect valve and primary operator;
 - (ii) A pressure indicator shall be installed;
 - (iii) The estimated height of the flame for a specified pressure, burner and pipe/tube size shall be tested and documented prior to installation and operation;
 - (iv) The total capacity of cylinders used indoors and connected together shall not exceed 300 lbs. of propane and not more than one manifold of cylinders may be located in the same area unless separated by a distance of at least 50 feet;
 - (v) When a hose is used, it shall be inspected before connection, shall not exceed 75 feet in length and shall be protected, by location or other means from impact and heat;
 - (vi) The burner and supports shall be made of non-combustible materials;
 - (vii) Unless completely separated from the flame with a 2 hour fire rated shield, a cylinder shall not be located less than 10 feet from the flame effect; and
 - (viii) A cylinder shall not be exposed to temperatures in excess of 125°F (50°C).
- (c) At least one portable dry chemical fire extinguisher of a total not less than 20-B,C rating shall be provided in a readily accessible location to the operator.
- (d) Where a flame effect is used indoors, the products of combustion shall:
- i) be effectively vented to the outdoors by a chimney, vent or continuously operating exhaust fan; or
 - ii) have the environment around the flame effect monitored for carbon monoxide levels. A carbon monoxide monitoring system shall be set to alarm at a level not greater than 25 ppm carbon monoxide. The flame effect shall be discontinued until the level of carbon monoxide is reduced below 25 ppm.

7.3.2.7 System using Fuel Accumulators (Propane Cannons) for Film

Fuel Accumulators (propane cannons) used in flame effect systems shall meet the following requirements:

- (a) An accumulator tank shall be designed, manufactured, and certified as an unfired pressure vessel with a minimum design pressure of not less than 250 psig.
- (b) Unless otherwise approved, welding shall not be done to the shell, head, or any other part of an accumulator tank.
- (c) Field welding of an accumulator tank shall be made only on saddle plates or brackets.
- (d) An accumulator tank shall be equipped with a properly sized, spring loaded relief valve in accordance with section 10.2 of the Ontario Propane Code. The relief valve shall be set at a pressure not exceeding the pressure rating of the lowest rated component.
- (e) A pressure gauge shall be provided with each accumulator tank.

- (f) A quarter turn manual shut-off valve and a quick disconnect device shall be installed at the connection to the inlet of an accumulator tank. This valve shall remain closed until charging of the accumulator tank.
- (g) The outlet of the accumulator tank shall be piped to the effect valve.
- (h) Propane shall not be put into an accumulator tank until the air and moisture in the tank has been purged in accordance with the procedures described in Annex A, Section A-4, "Removal of Air and Moisture from Cylinders and Motor Fuel Containers," in the Ontario Propane Code.
- (i) An accumulator tank shall be charged as close to the time of the actual arming and firing of the effect as is practical.
- (j) Where the fuel supply to an accumulator tank is not disconnected and removed after charging, the supply piping to the accumulator tank shall be equipped with the following:
 - (i) A pressure regulator;
 - (ii) A manual quarter turn shut-off valve;
 - (iii) A pressure gauge;
 - (iv) two automatic safety shut-off valves piped in series and wired in parallel through a deadperson switch; and
 - (v) A high gas pressure switch with a setting no higher than 10% of the pressure intended for the accumulator tank.
- (k) The complete system with all components and accessories in place shall be leak tested at the system operating pressure prior to use.
- (l) Fuel accumulators shall have a written record of tests of flame effect size related to accumulator tank pressures and burner types (nozzles) including wind conditions and ignition types at the time of the tests. This written record shall be available upon the request of the authority having jurisdiction.
- (m) The mixing of air or any other oxidizing media with fuel in an accumulator tank shall be prohibited. The mixing of an inert gas with fuel in an accumulator tank is permissible.
- (n) Where an accumulator tank is used indoors, the products of combustion shall:
 - (i) be effectively vented to the outdoors by a chimney, vent or continuously operating exhaust fan; or
 - (ii) have the environment around the flame effect monitored for carbon monoxide levels. A carbon monoxide monitoring system shall be set to alarm at a level not greater than 25 ppm carbon monoxide. The flame effect shall be discontinued until the level of carbon monoxide is reduced to below 25 ppm.
- (o) Where an accumulator tank is used indoors, means shall be provided to purge gas from the volume of the space to which the flame effect is used:
 - (i) at least four times of the entire volume and flue passages; or
 - (ii) a combustible gas analyzer in conjunction with a purge system shall be used to confirm that gas has not accumulated beyond 25% of the lower explosive limit throughout the entire volume and flue passages.
- (p) At least one portable dry chemical fire extinguisher of not less than 20-B,C rating shall be provided in a readily accessible location to the operator.

- (q) Unless completely purged of propane, an accumulator tank shall not be used with any other product and shall be stored outdoors in accordance with section 6.5.2 of the Ontario Propane Code. The person purging the accumulator tank shall be a holder of a Record-of-Training for filling cylinders.
- (r) An accumulator tank may be stored indoors when completely purged of propane.

7.3.2.8 Propane cylinders shall be:

- (a) in an upright position on a firm footing and secured to prevent them from being accidentally tipped over;
- (b) a cylinder in use inside a building shall not be located near an exit, stairway, or an area normally used or intended for safe evacuation of people;
- (c) positioned so that the relief valve points away from any sources of ignition.

7.3.2.9 Inversion of propane cylinders to supply a propane effect is strictly prohibited.

7.3.2.10 When changing cylinders, clear the area within fifteen feet of the cylinder installation of all sources of ignition, use only the proper sized wrench for making connections.

7.3.2.11 Where certified appliances are temporarily installed and used, all combustion safety interlocks, combustion safeguards, excess temperature limits, pressure relief valves, lower water cut-outs, and other applicable safety controls shall be tested for proper operation prior to activating the appliance.

7.3.2.12 Where liquid propane is used for a flame effect, all applicable requirements of the Ontario Propane Code and the CSA-B149.3 shall apply.

ANNEX L

Installation of piping or tubing in rocky areas

Where, due to rocky terrain, it is impractical to comply with section 6.15.4 (a), tubing systems may be installed in accordance with this annex, the manufacturer's instructions and the authority having jurisdiction.

1. When piping or tubing cannot be buried a minimum of 15 inches due to rocky terrain, Type L polyethylene-coated copper tubing sleeved using high-density polyethylene tubing that contains a minimum 2% UV resistance by weight, may be used in accordance with this document and the Manufacturer's Instructions.
2. Tubing shall be installed without joints unless the required distance is beyond 100 ft. Tubing system shall be joined or connected in accordance with clause 6.15.3 and the sleeve shall be connected in accordance with the manufacturer's instructions.
3. Measures shall be taken to ensure that the pipe or tubing is protected from damage from vehicles, snow machines etc. (see clause 6.16.3)
4. where ground cover is not possible,
 - a) Aboveground sections of the tubing sleeve shall be anchored to the contour of a secure rock surface at minimum 10 feet intervals. The sleeve shall be banded every 3 feet with a high visibility yellow Tape
 - b) Piping shall follow the contour of the terrain without unsupported sections of pipe or tubing occurring above grade
5. PVC tubing sleeve to be sealed at each end to prevent the entrance of dirt and moisture.
6. A trench for underground sections of the tubing shall be in compliance with clause 6.15.5. The backfill, material shall be free of sharp objects, stones larger than 38 mm or any other material that may damage the piping or tubing.
7. Permanent Markers (yellow with black writing) shall be placed along the piping/tubing system every 10 ft. warning that the piping/tubing is part of a natural gas or propane system and when installed on rock, the signs shall be anchored to the rock.
8. Permanent Markers (yellow with black writing) to be placed at the natural gas meter or propane container, and building or outdoor appliance warning of a shallow underground propane/natural gas piping or tubing system.
9. The markers referred to in 7 and 8 shall be of a height above the anticipated snow level for the area.
10. The PE material being used as protective sleeve shall conform the Standard CGSB 41-GP-25M and shall contain a minimum 2% content of carbon black additive, which gives the product essentially a 50 year life cycle for resistance to UV rays from the sun.

ANNEX M (Page 1)

Mandatory Safety Checks for Residential (one or two family Dwelling) Natural Draft Boilers Equipped With Draft Hoods 300,000 BTU's or Less.

SCHEDULE A – OWNER/USER INFORMATION SHEET



14th Floor, Centre Tower
3300 Bloor Street West
Toronto, Ontario
Canada M8X 2X4
Tel.: 416.734.3300
Fax: 416.231.1626
Toll Free: 1.877.682.8772

www.tssa.org

Mandatory Inspection of Gas (Natural Gas and Propane) Fired Natural Draft Boilers Equipped with a Draft Control Device

Attention Property Owner/User:

The Technical Standards and Safety Authority (TSSA) has the mandate to maintain and improve safety for Ontario residents in the fuels and other regulated sectors. TSSA is officially designated by Ontario's Ministry of Consumer Services to administer and enforce the *Technical Standards and Safety Act, 2000*, which governs fuels safety in Ontario.

TSSA has determined that the use of natural gas and propane burning natural draft boilers equipped with a draft control device may result in a carbon monoxide (CO) safety hazard in the home, that may cause personal injury up to and including death.

CO is a colourless gas produced when fuels such as natural gas and propane burn incompletely. CO itself is odourless and tasteless but it may be accompanied by an abnormal odour of incomplete fuel combustion. Symptoms of CO poisoning include nausea and vomiting, dizziness, burning eyes, difficulty breathing, confusion and loss of consciousness.

Investigated CO incidents have shown that key contributing causes of the incidents are that:

- many boilers are not being maintained in accordance with the boiler manufacturer's instructions. It is imperative that boilers are cleaned properly on a regular basis to reduce the likelihood of CO production.
- chimneys intended to evacuate CO and smoke from the boilers to the outdoors, are not properly operating due to other exhaust systems (such as wood fireplaces, dryer exhausts, new kitchen exhausts, etc.) and the installation of new, more energy efficient windows and doors. These systems and home upgrades limit the outside air infiltration into the home and cause the house to depressurize.

To address this situation, TSSA is legally requiring that all heating contractors perform a CO safety check when a technician enters a home with a boiler. The technician is obligated to take action when an unsafe condition is identified. These checks will be required when a technician enters a home with this type of boiler regardless of whether the homeowner/user has requested service on that boiler. This check is only required once during the heating season. The gas technician is also required to visually examine the boiler and if there are signs of poor operation,

ANNEX M (Page 2)

Mandatory Safety Checks for Residential (one or two family Dwelling) Natural Draft Boilers Equipped With Draft Hoods 300,000 BTU's or Less.

SCHEDULE A – OWNER/USER INFORMATION SHEET

additional steps may be required including a home depressurization test or non-compliances corrected by adding combustion air, make-up air, installing a water bypass, etc.

TSSA is requiring that CO alarm(s) be located in the vicinity or within the sleeping quarters of the home. The technician is required to ensure that the alarm(s) is/are present. If alarms are missing, the technician is required to issue written notification that the alarms must to be installed. If the alarms are not installed within the notification time limit, the fuel supply to your home will be shut off.

As an equipment owner/user, TSSA and industry remind you of your responsibility to properly maintain and operate your boiler and all other fuels burning equipment. Annual maintenance, as a minimum, by a qualified contractor is the best method to fulfil this requirement.

If there are safety issues identified during this mandatory inspection, the boiler will need to be serviced and depending on what type of service is necessary, the cost will vary. To best ensure the continued safety of you and your family, we ask that you allow the technician's inspection/evaluation, and that you have your boiler maintained on a regular basis.

If you do not allow the inspection or non-compliances are identified such as no CO alarm(s) present, your boiler will be identified as requiring compliance within a specified time. If that time lapses and the inspection is not completed or non-compliances are not corrected, the fuel supply to your boiler or home will be shut-off. If there is an immediate hazard identified during the inspection that cannot be corrected, the fuel supply to the boiler will be immediately terminated.


TSSA and the associated industries thank you in advance for your co-operation in this regard. If you require further clarification or have questions, please ask the gas technician performing the inspection, your fuel supplier or TSSA toll-free at 1-877-682-8772. Visit www.tssa.org for more information.

ANNEX M (Page 2)

Mandatory Safety Checks for Residential (one or two family Dwelling) Natural Draft Boilers
Equipped With Draft Hoods 300,000 BTU's or Less.

SCHEDULE B – BOILER INSPECTION TAG

Please note that this Label shall be of similar
construction as a Pressure Test Tag.

	
GAS FIRED RESIDENTIAL NATURAL DRAFT BOILERS EQUIPPED WITH A DRAFT CONTROL DEVICE	
ADDRESS OF INSTALLATION	
CONTRACTOR'S NAME	
CONTRACTOR'S PHONE#	
REGISTRATION #	
BOILER INSPECTION INFORMATION Expires May 1 following the Date of Inspection as shown below.	
BOILER MANUFACTURER	
MODEL#	
SERIAL#	
DATE OF INSPECTION	
CARBON MONOXIDE (CO) ALARM(S) INSTALLED	<input type="checkbox"/>
CARBON MONOXIDE (CO) IN FLUEAS FOUND	
CARBON MONOXIDE (CO) IN FLUEAS LEFT	
THE PROVISIONS IN CLAUSE 4.25 OF CSA B149.1-10 AS AMENDED BY TSSA'S CODE ADOPTION DOCUMENT F3-200-12 HAVE BEEN SATISFIED	
<input type="checkbox"/>	
GAS TECHNICIAN NAME	
CERTIFICATE NUMBER AND CLASSIFICATION	
DO NOT REMOVE Attach this label to gas supply piping as close as possible to boiler.	

Mandatory Safety Checks for Residential (one or two family Dwelling) Natural Draft Boilers Equipped With Draft Hoods 300,000 BTU's or Less.

SCHEDULE C – DEPRESSURIZATION TEST



14th Floor, Centre Tower
3300 Bloor Street West
Toronto, Ontario
Canada M8X 2X4
Tel.: 416.734.3300
Fax: 416.231.1626
Toll Free: 1.877.682.8772

www.tssa.org

The following steps shall be followed for the depressurization test:

1. With the boiler and other appliances connected to the same common vent not in operation:
 - a. Seal any unused openings in the common venting system;
 - b. Visually inspect the venting system for proper size and horizontal pitch and determine there is no blockage or restriction, leakage, corrosion and other deficiencies which could cause an unsafe condition;
 - c. Insofar as is practical, close all building doors and windows and all doors between the space in which the appliances remaining connected to the common venting system are located and other spaces of the building. Turn on clothes dryers and any appliance, including gas fireplaces, not connected to the common venting system. Turn on any exhaust fans, such as range hoods and bathroom exhausts, so they will operate at maximum speed. Do not operate a summer exhaust fan. Close fireplace dampers for solid fuel fireplaces.
2. Allow the exhaust equipment to operate for five minutes.
3. Place in operation the boiler being inspected. Follow the lighting instructions. Adjust thermostat so the boiler will operate continuously.
4. Test for spillage at the draft control device relief opening after 5 minutes of main burner operation.
5. After it has been determined that each appliance remaining connected to the common venting system properly vents when tested as outlined above, return doors, windows, exhaust fans, fireplace dampers and any other gas burning appliance to their previous condition of use.
6. Any improper operation of the common venting system shall be corrected in a permanent manner.