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| Fuels Safety Program | Ref. No.: FS-219-16 |
| Fuel Oil Code Adoption Document Amendment | Date: April 4, 2016 |

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), and
Ontario Regulation 213/01 (Fuel Oil)

The Director for the purposes of Ontario Regulation 213/01 (Fuel Oil), pursuant to section 5(1) of Ontario Regulation 223/01 (Codes and Standards Adopted by Reference), hereby provides notice that the FUEL OIL 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 Fuel Oil Code Adoption Document previously published are revoked and replaced with the following:

Background:

This amendment to the Fuel Oil Code Adoption Document (CAD) revokes and replaces the previous amendment (FS-202-2012, dated November 1, 2012).

This CAD amendment adopts the new CSA-B139 Series-15, consisting of the following:

- B139.1.0-15, General requirements for large installations
- B139.1.1-15, General requirements for stationary engines
- B139.1.2-15, General requirements for special installations
- B139.2-15, Installation code for oil-burning equipment for residential and small commercial buildings

The remainder of this CAD amendment makes Ontario-specific revisions to the above codes. The major changes include:

- New approval submission requirements for high pressure fuel piping to be consistent with the Boilers and Pressure Vessels Code
- New approval submission requirements for installations that use an anti-siphon systems instead of a certified anti-siphon valve
- Changes consistent with the Ontario Fire Code and National Fire Code
- Only recognizing the use of Standards Council of Canada accepted standards

1. The CSA Standard B139 Series-15 “Installation Code for Oil Burning Equipment” published in January 2015 by CSA Group is adopted with the following amendments:

1.1 Amendments to CSA B139.1.0-15, “General requirements for large installations” are as follows:

1.1.1 Clause 2.1 is revoked and the following is substituted:

2.1

This Code refers to publications for products and materials that are listed in Annex A, which is not a mandatory part of this Code.

1.1.2 Clause 2.2 is revoked and the following is substituted:

2.2

Standards and Other Recognized Documents (“ORD”s) which are:

- a) listed in Clause A.1 of Annex A;
- b) accepted by the Standards Council of Canada (SCC); or
- c) published by SCC accredited standards development organizations, are approved for use with this Code.

2.3

Unless otherwise stipulated by the Director, the latest edition of the standards and ORD's listed in Annex A.1 and other standards that are accepted by the Standards Council of Canada are effective 12 months after publication.

2.4

Products and materials tested or listed under the standards listed in Clause A.2 of Annex A are not approved for use.

2.5

Products and materials declared by the manufacturer as complying with Annex A.3 are approved with the following exceptions:

- a) API 650, Welded Tanks for Oil Storage; and
- b) CAN/ULC-S668, Standard for Liners Used for Secondary Containment of Aboveground Flammable and Combustible Liquid Tanks.

Background:

TSSA approves of standards and products that have been approved by the Standards Council of Canada based on the “Titles of Standards and Laboratory Test Reports Authorized in the Province of Ontario” as referenced in the Ontario Regulation 213/01, Fuel Oil. Approved standards and equipment are not limited to those listed in Annex A. The list of standards shown in Annex A provide information on current standards used for certification. A complete list will be held by the Standards Council of Canada.

1.1.3 Clause 3 is amended by revoking the definitions of “Appliance”, “Approved”, “Authority having jurisdiction”, and “Conform.”

1.1.4 Clause 3 is amended by adding the following definitions:

Authority having jurisdiction — the Director designated for the purposes of O. Reg. 213/01 (Fuel Oil).

Manufacturer's Instructions – means the certified manufacturer's instructions.

Note: Where certified manufacturer's instructions are not available, follow the code.

Manufacturer's instructions are recommendations if they have not been certified.

Background:

The definitions of "appliance" and "approved" are in the Fuel Oil regulation.

The definition of "conform" has been revoked to be consistent with the amendments in 1.1.1 and 1.1.2.

Manufacturer's instructions that are not certified may be used as guidelines, but are not mandatory.

1.1.5 Clause 4.1.1 is revoked and the following is substituted:

4.1.1

Oil-burning equipment, including appliances, accessories, equipment, components, tanks, and any other thing associated with the oil-burning equipment, shall meet the requirements of this Code, and shall be approved and installed for its intended use in accordance with the manufacturer's instructions and this Code.

Where there is a conflict between this Code and the manufacturer's instructions, whichever is more stringent shall apply.

Background:

A difference in requirements between the Code and the manufacturer's instructions is not a conflict if the requirements of both documents can be met.

1.1.6 Clause 4.1.2 is revoked and the following is substituted:

4.1.2

Appliances, except engines, shall be certified to the applicable CSA B140 Series of standards or approved.

Background:

Other standards outside of the CSA B140 series may be approved by the Standards Council of Canada. TSSA field approved equipment are also approved.

1.1.7 Clause 4.15 is amended by adding the following:

4.15.3

An appliance or tank 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 if the appliance consumption is 7 Imperial gallons per hour or more; or
- (b) inspection and confirmation by a certified technician that it is fit for continued use if the appliance consumption is less than 7 Imperial gallons per hour.

1.1.8 Clause 5.1.2 is revoked and the following is substituted:

5.1.2

An oil-line-mounted fuel-containing device, component, or accessory with a casing that has a melting point of less than 538 °C (1000°F) may be installed in an oil supply line when the device is

- (a) installed in a part of the oil line so that the bottom of the device is higher than the top of the tank and operates under negative pressure at the location of the device; or
- (b) protected by a fusible-link shut-off valve with a casing capable of withstanding 538°C (1000°F) and a fusible-link temperature rating not exceeding 177 °C (350°F) all of which conforms to ULC/ORD-C842, "Guide for the Investigation of Valves for Flammable and Combustible Liquid Storage Tanks". This valve shall be installed immediately adjacent to the fuel containing device and between the fuel-containing device and the tank.

Background:

References to US standards have been removed since they are not recognized by the Standards Council of Canada.

1.1.9 Clause 5.2.1.1 is amended by adding the following:

5.2.1.1.1

Where the codes referenced in section 5.2.1.1 refer to approval of the Owner, approval shall also be required from the Authority Having Jurisdiction.

Background:

The referenced codes allow deviations from the normal requirements that are subject to approval by the owner of the installation. TSSA requires these deviations to be submitted for approval prior to use.

5.2.1.1.2

Piping or tubing shall be submitted to TSSA for approval prior to use where

- (a) the design pressure is greater than 690 kpa (100 psi); or
- (b) the design temperature is greater than 38°C, and the design pressure is greater than 100 kpa (15 psi).

Background:

This is consistent with both the Gaseous Fuels Code Adoption Document and the requirements of the TSSA Boilers and Pressure Vessels program. TSSA requires these types of installations to be submitted for approval prior to use.

1.1.10 Clause 5.2.2 is revoked and the following is substituted:

5.2.2 Joints and connections – Above ground

Piping and tubing joints and connections shall be made in accordance with the following:

- (a) Joints and connections shall be made fuel oil-tight.
- (b) Joints and connections shall be made with standard pipe fittings or by welding. All standard threaded fittings shall be

- (i) malleable iron which shall comply with ANSI/ASME B16.3, "Malleable Iron Threaded Forgings: Classes 150 and 300", or ANSI/ASME B16.39, "Malleable Iron Threaded Pipe Unions: Classes 150, 250 and 300";
 - (ii) cast brass or bronze which shall comply with ANSI/ASME B16.15, "Cast Copper Alloy Threaded Fittings: Classes 125 and 250"; or
 - (iii) stainless steel which shall comply with ANSI/ASME B16.11, "Forged Fittings, Socket-Welding and Threaded."
- (c) Welded and brazed connections shall be made by a CWB qualified welder in accordance with ASME Boiler and Pressure Vessel Code, Section IX, or as otherwise required by the authority having jurisdiction responsible for such qualifications.
Note: All concealed piping should be welded, wherever possible (see Clause 5.2.3).
- (d) A joint in seamless copper, brass, or stainless steel tubing shall be
- (i) made by means of a flare joint or solder fitting with a material having a melting point exceeding 538°C (1000°F); or
 - (ii) brazed with a material having a melting point exceeding 538 °C (1000°F). Flare nuts shall be forged, and compression fittings shall not be used.
- (e) Unions requiring gaskets or packing, right and left couplings, and solder or brazing materials having a melting point less than 538 °C (1000°F) shall not be used in connecting fuel oil lines, fill lines, or vent lines.
- (f) Notwithstanding Item (e), insulating bushings or flanges designed for service may be used where isolation is necessary for electrolytic protection or where pipes are used for heating elements in extra-low-voltage resistance heating systems for heavy oils in accordance with Clause 4.11.9.

Background:

It is clarified that solder fittings shall use materials with a melting temperature exceeding 538°C (1000°F).

1.1.11 Clause 5.4.4.1 is revoked and the following is substituted:

5.4.4.1

Automatic shut-off valves shall conform to

- (a) CSA C22.2 No. 139, "Electrically operated valves", for solenoid valves; or
- (b) ULC/ORD-C842, "Guide for the Investigation of Valves for Flammable and Combustible Liquid Storage Tanks", for valve bodies suitable for mounting of valve actuation.

Background:

References to US standards have been removed since they are not recognized by the Standards Council of Canada.

1.1.12 Clause 5.4.4 is amended by adding the following:

5.4.4.6

Where the fuel line is located or partially located at a level below the maximum fuel level of the tank, the fuel line shall be protected with an approved anti-siphon device.

5.4.4.7

Where an anti-siphon valve is installed, a tee with a manual shut-off valve and cap shall be installed at the lowest level of the downstream piping.

Note: This is to allow for periodic testing of the operation of the anti-siphon valve.

Background:

Approved anti-siphon devices include certified anti-siphon valves. Solenoid valves without leak detection and secondary containment are not acceptable to be used as anti-siphon valves.

1.1.13 Clause 6.1 is amended by adding the following

6.1.2

Tanks that are not vented to the atmosphere shall not be installed.

Background:

Pressure tanks that are not atmospherically vented are not permitted to be installed.

1.1.14 Clause 6.2.1.4 is revoked and the following is substituted:

6.2.1.4

Tanks shall not be reused, except if it is in good condition and the standard to which it was originally certified has not changed.

Background:

Information on the most current edition of standard is available from the Standards Council of Canada or from the standards writing organization that published the previous edition. Once a new edition of the standard is published, a variance application may be submitted to request for the tank to be reused.

1.1.15 Clause 6.2.1 is amended by adding the following:

6.2.1.6

Steel tanks shall be provided with

- (a) a double bottom tank construction consisting of the tank shell and double contained heads, with a minimum coverage of 50 mm above the bottom of the tank, and a visual interstitial monitoring device located above the highest level of the tank;
- (b) non-combustible secondary containment; or
- (c) a minimum 300° integral secondary containment with monitoring of the interstitial space.

Background:

This applies to both indoor and outdoor tank installations.

1.1.16 Clause 8.3.1 is amended by adding the following:

8.3.1.1

Individual tanks in excess of 250,000 L shall be separated from the nearest building and property lines by at least 7.5 m.

Background:

This is consistent with the requirement in the National Fire Code of Canada.

1.1.17 Clause 8.4 is amended by adding the following:

8.4.4

A maximum of two supply tanks with a total capacity of 2500 L (550 gal) or less may be interconnected below the highest liquid level of the tanks.

Background:

This limits the amount that may leak in the event of a piping failure.

1.1.18 Clause 8 is amended by adding the following:

8.8. Disuse of Aboveground Tanks

8.8.1

Where an aboveground tank with a capacity greater than 2500 L is not used for more than 180 days, but less than 3 years, the owner or operator of the tank shall empty the tank and all associated piping of fluid content and make the tank and connected piping vapour-free.

8.9.2

Where an aboveground tank system with a capacity greater than 2500 L is not used for more than 3 years, the owner or operator of the aboveground tank system and the owner of the property on which the tank system is located shall remove the tank and all associated piping.

Background:

This is consistent with the previous edition of the Ontario Installation Code for Oil Burning Equipment, CSA-B1390N-06.

1.1.19 Clause 9.3.4.2(c) is revoked and the following is substituted:

9.3.4.2

...

- (c) have a spill containment device at the opening that conforms to CAN/ULC-S663, "Standard for Spill Containment Devices for Flammable and Combustible Liquid Aboveground Storage Tanks";

Background:

Reference is to the current ULC standard for spill containment devices.

1.1.20 Clause 9.6.4 is revoked and the following is substituted:

9.6.4

Vents shall be equipped with a weather-proof hood (vent cap) that conforms to ULC S631, "Isolating Bushings for Steel Underground Tanks Protected with External Corrosion Protection Systems", and shall have a nominal opening no less than the requirement of the tank's certification requirements.

Background:

References to US standards have been removed since they are not recognized by the Standards Council of Canada.

1.1.21 Clause 9.7.1.3(b) is revoked and the following is substituted:

9.7.1.3

...

(b) equipped with a means of detecting a leak from the primary pipe or tube that conforms to CAN/ULC-S675.2 "Standard for Nonvolumetric Precision Leak Detection Devices for Underground and Aboveground Storage Tanks and Piping for Flammable and Combustible Liquids"; if a leak is detected, an alarm shall be annunciated at a supervised location.

Background:

Reference is to the current ULC standard on leak detection for double wall piping.

1.1.22 Clause 9.7.1.10 is revoked and the following is substituted:

9.7.1.10

Where underground piping enters a building and is the low point in the underground piping, the underground piping shall be sloped toward the building with a minimum slope of 1% (1/8 in/ft), and the portion of the underground piping located inside the building shall terminate inside an accessible sump. The sump required in this Clause may also serve the requirement of Clause 9.7.1.11(e), provided it is constructed in accordance with 9.7.1.13(c).

Background:

References the clause that describes the requirements for indoor sumps.

1.1.23 Clause 9.7.1 is amended by adding the following:

9.7.1.14

Underground plastic piping or tubing shall be accompanied by a tracing wire or other electronically detectable tracing media.

Background:

This is to allow easy location of non-metallic underground piping or tubing runs to avoid accidental damage.

1.1.24 Clause 9.7.4.6(c) is revoked and the following is substituted:

9.7.4.6

...

- (c) The secondary containment of the product transfer piping shall terminate within the monitored transition sump and allow for free drainage of the interstitial space of the pipe into the transition sump.

Background:

This is an editorial correction.

1.1.25 Clause 10.1.1 is revoked and the following is substituted:

10.1.1

All tanks shall be provided with a fill opening or a fill pipe. The fill pipe material shall comply with Clause 5. Fill pipe openings on all tanks shall not be located higher than 4.15 m (13 ft) above the bottom of the storage or supply tank, unless the installation is in compliance with Clause 10.5.1.2 or 10.5.1.3.

Background:

Additional requirements apply if the fill pipe termination is higher than 4.15 m and lower than 7 m from the bottom of the tank. Additional requirements apply if the fill pipe termination is more than 7 m from the bottom of the tank as specified in clause 10.5.1.3.

1.1.26 Clause 10.1.3 is revoked and the following is substituted:

10.1.3

Fuel oil tanks shall be equipped with an overfill protection device that conforms to CAN/ULC-S661, "Standard for Overfill Protection Devices for Flammable and Combustible Liquid Storage Tanks".

Background:

Certified overfill protection devices are required for all tanks in this section.

1.1.27 Clause 10.5.1.1 is revoked.

Background:

Tanks shall be vented in accordance with this code. Where there are conflicts between this code and the manufacturer's instructions, the more stringent shall apply.

1.1.28 Clause 10.6.2.4 is revoked.

Background:

This type of installation may be available through variance and proof-of-design testing.

1.1.29 Clause 10.6.3.1 is revoked and the following is substituted:

10.6.3.1

Where an auxiliary supply tank is directly vented to the outdoors, the vent shall comply with Clause 10.5 and Clauses 10.6.3.2 to 10.6.3.5. The design of the installation shall be submitted to the authority having jurisdiction for approval prior to the tank installation.

Background:

These types of installation have a complexity that require TSSA approval prior to use.

1.1.30 Clause 12.1 is amended by adding the following:

12.1.14

For positive-pressure systems installed indoors, uncertified vent systems shall be gas-tight and pressure tested in accordance with Clause 13.7.

Background:

This provides protection to prevent leakage of flue gases inside of a building.

12.1.15

Unlisted metal chimneys serving appliances producing flue gases having a temperature below 177°C (350°F) at the entrance to the chimney at full or partial load shall be one of the following:

- (a) constructed of or lined with acid and condensate resistant stainless steel; or
- (b) lined with approved acid and condensate resistant refractory material or other approved materials.

Background:

This provides protection to prevent premature corrosion failures of vent systems.

1.1.31 Clause 12.8.3.1 is revoked and the following is substituted:

12.8.3.1

Where an uncertified metal chimney serving appliances with a flue-gas temperature measured at the appliance outlet not exceeding 538 °C (1000°F) passes through roof construction that is partially or entirely of combustible construction, the combustible roofing material shall be cut back from the chimney a minimum of 450 mm (18 in), or the combustible roofing material shall be separated from the chimney by a ventilating thimble, and the thimble shall

- (a) be fabricated of corrosion-resistant metal, or plain carbon steel if protected from the weather;
- (b) be a minimum 0.91 mm (20 ga) wall thickness;
- (c) extend above and below the combustible material by a minimum distance of 225 mm (9 in);
- (d) be separated horizontally from the combustible material by a minimum distance of 25 mm (1 in);
- (e) be separated horizontally from the chimney wall by a minimum distance of 200 mm (8 in), except as permitted in accordance with Clause 12.8.3.2; and
- (f) be provided with storm flashing with minimum ventilation openings equal to the thimble ventilation opening.

Notes:

(1) *Ventilation clearances between the storm flashing and the roof should take into consideration effects of roof snow loading.*

(2) *Refer to Figure B.9.*

Background:

This clarifies that the thimble requirements apply to chimneys that serve appliances referred to in section 12.3.

1.1.32 Table 11(a) is revoked and the following is substituted:

Table 11(a)
Leak detection testing and monitoring of underground tanks
 (See Clause 13.3.2.1.)

| Type of tank | Commissioning test | Continuous in-service monitoring | Leak suspected |
|--------------|--|----------------------------------|-------------------------------|
| Double wall | Precision leak detection test or secondary containment test* | Secondary containment monitoring | Precision Leak Detection Test |

**The secondary containment test is capable of detecting leaks in the interstitial space of the tank. Risers, connections, and vents are also susceptible to leakage and shall also be tested.*

Background:

When a leak is suspected, confirmation of the leak must be expedited.

1.1.33 Clause 13.3.5.3 is amended by adding the following:

13.3.5.3.4

Pneumatic pressure testing of tanks shall not be considered a precision leak test.

Background:

Due to the size of the tanks and the limited pressure to which they may be subjected, pressure testing of tanks are not considered precision leak tests.

1.1.34 Clause 13.4.2 is amended by adding the following:

13.4.2

Aboveground piping or tubing shall be pneumatically tested to at least 350 kPa (50 psi) gauge pressure or 150% of its maximum operating pressure, whichever is greater.

Background:

This requires a higher pressure test when the system will be operated at higher pressures.

1.1.35 Annex M is normative and a mandatory part of this code.

1.1.36 Clause M.4 is revoked the following is substituted:

M.4 Environmental responsibilities

4.1

Where a leak is suspected or where required by the Director, one or more of the following, as applicable, shall confirm whether a leak exists and determine the source of the leak:

- (a) the owner of a facility;
- (b) the authorization holder of a facility;
- (c) the owner of the tank system(s);
- (d) the authorization holder of the tank system(s);
- (e) the owner of the property where the equipment is installed;
- (f) the user of the equipment; or
- (g) the driver of the tank vehicle.

4.2

In the event of a spill, where a leak is confirmed, where there is discovery of a petroleum product that has escaped to the environment or inside a building, or where required by the Director, one or more of the responsible individuals identified in Clause 4.1, as applicable, shall notify the Director and the responsible individual(s) shall further:

- (a) forthwith notify the Director in the event of a fire or explosion and remove any potential for fire or explosion hazard;
- (b) provide all information to the Director or an inspector, as required;
- (c) cease using and empty products from any leaking part of the tank system(s);
- (d) repair, replace, or remove all defective underground or aboveground tank system(s) or equipment; and
- (e) take all practical measures to comply with the Environmental Management Protocol for Operating Fuel Handling Facilities in Ontario.

Note: To notify the Director, contact the Spills Action Centre of the Ontario Ministry of Environment at 1-800-268-6060.

4.3

Where an underground tank system is being removed or replaced and the property continues to maintain fuel storage equipment or tank systems, the owner of a facility, the operator of the facility, the owner of the tank system(s), the operator of the tank system(s), or the owner of the property where the equipment is installed, as applicable, shall submit an assessment report to TSSA that delineates the full extent of any petroleum product that has escaped to the environment both on-site and, where necessary and practical, off-site.

4.3.1

Where an underground storage tank system(s) is removed permanently and the site no longer maintains any fuel storage tank system(s), the owner or authorization holder of a facility, the

owner or authorization holder of the storage tank system, or the owner of the property on which the equipment is installed, as the case may be, shall

- (a) remove or make product-free the remainder of the system;
- (b) provide written notification to the Director, the Ministry of Environment and the local municipality within 90 days of the removal of the equipment; and
- (c) submit an assessment report to TSSA that delineates the full extent of any petroleum product that has escaped into the environment or inside a building both on site and, where necessary and practical, off site.

4.4

Where outside aboveground tank system(s) with a capacity greater than 5000 L (1100 gal) have been removed or replaced and the property continues to maintain fuel storage equipment or tank systems, the owner of the facility, the operator of the facility, the owner of the tank system(s), the operator of the tank system(s), or the owner of the property where the equipment is installed, as applicable, shall submit an assessment report to TSSA that delineates the full extent of any petroleum product.

4.5

Where aboveground tank system(s) with a capacity less than or equal to 5000 L (1100 gal) have been removed or replaced and the property continues to maintain fuel storage equipment or tank system(s), the owner of the facility, the operator of the facility, the owner of the tank system(s), the operator of the tank system(s), or the owner of the property where the equipment is installed, as applicable, shall

- (a) submit an assessment report to TSSA that delineates the full extent of any petroleum product that has escaped to the environment if the physical installation does not allow for inspection of the complete surface of the tank; and
- (b) if the physical installation allows for an inspection as outlined, submit an assessment only when a leak is suspected or where a spill has occurred and has not been properly remediated in accordance with the regulatory requirements.

4.6

Where aboveground tank system(s) with a capacity less than or equal to 5000 L (1100 gal) have been removed permanently and the property no longer maintains any fuel storage or tank system(s), the owner of the facility, the operator of the facility, the owner of the tank system(s), the operator of the tank system(s), or the owner of the property where the equipment is installed, as applicable, shall

- (a) submit an assessment report to TSSA that delineates the full extent of any petroleum product that has escaped to the environment if the physical installation does not allow for inspection of the complete surface of the tank;
- (b) if the physical installation allows for an inspection as outlined, submit an assessment report only when a leak is suspected or where a spill has occurred and has not been properly remediated in accordance with the regulatory requirements; the Ministry of Environment shall also forthwith be notified in accordance with the Environmental Protection Act, as amended, and the Ontario Water Resources Act, as amended.

4.7

Where aboveground tank system(s) with a capacity greater than 5000 L (1100 gal) have been removed permanently and the property no longer maintains any fuel storage or tank systems, the owner of the facility, the operator of the facility, the owner of the tank system(s), the operator of the tank system(s), or the owner of the property where the equipment is installed, as applicable, shall

- (a) submit an assessment report to TSSA that delineates the full extent of any petroleum product that has escaped to the environment or inside a building both on-site and, where necessary and practical, off-site; and

- (b) forthwith notify the Ministry of Environment in accordance with the Environmental Protection Act, as amended, and the Ontario Water Resources Act, as amended.

Background:

The *Environmental Management Protocol for Operating Fuel Handling Facilities in Ontario* is available at the TSSA website: www.tssa.org

1.2 Amendments to CSA B139.1.1-15 “General requirements for stationary engines” are as follows:

1.2.1 Clause 1.1 is revoked and the following is substituted:

1.1

This Code specifies minimum requirements for the installation of oil-fueled stationary and portable engines used for

- (a) the generation of electrical power for equipment;
- (b) the generation of electrical power in accordance with CSA C282, “Emergency electrical power supply for buildings”;
- (c) the generation of electrical power in accordance with CSA Z32, “Electrical safety and essential electrical systems in health care facilities”; and
- (d) directly connected shaft power for building equipment, industrial equipment, and emergency equipment.

Note: Examples of “building equipment” include air compressors and refrigeration equipment; “industrial equipment” includes pumps, compressors, hoisting equipment, lighting, and “emergency equipment” includes fire pumps. This note does not impose limits on types of driven equipment.

Background:

The scope is clarified to indicate that the Code also provides minimum requirements for portable equipment, such as those on trailers and vehicles.

1.2.2 Clause 4.1.1 is revoked and the following is substituted:

4.1.1

The following components and accessories shall be considered to be included as part of the engine as an appliance where they are factory installed and the manufacturer provides a minimum 1 year warranty on the installation, material defects, or factory workmanship:

- (a) engine block, heads and engine fuel-injection piping, engine driven fuel pumps;
- (b) fuel oil cooler piping within the engine skid;
- (c) fuel oil supply inlet piping connection to
 - i. engine mounted filters;
 - ii. engine frame mounted filters; or
 - iii. engine frame mounted bulkhead fitting;
- (d) fuel oil return outlet piping connection to
 - i. engine return fuel-rail outlet fitting; or
 - ii. engine frame mounted bulkhead fitting;
- (e) flexible connector or hose connector which form part of fuel piping described in Clauses (c) and (d) where
 - i. supplied, by the engine manufacturer;
 - ii. specified in the manufacturer’s installation instructions;
 - iii. cycle tested with the engine by the manufacturer with available on-site documentation;
 - iv. not longer than 1.5 metres (5 feet);
- (f) the exhaust manifold flange, or the turbocharger outlet flange for turbo-charged engines, but does not include any flexible connectors; and
- (g) an integral supply tank or integral auxiliary supply tank which does not exceed 45 litres (10 gal) capacity.

Background:

As appliances, engines are exempt from certification. The engine must be installed in accordance with the code. The above specifies what is considered as part of the engine and exempt from certification.

1.2.3 Clause 4.3 is amended by adding the following:

4.3.3

For outdoor generator enclosures with sub-base fuel tanks, the fill pipe may be permitted to be housed inside a recessed area such that:

- (a) there is a minimum of one open side, and
- (b) the recessed area is seal welded vapour-tight to prevent any fumes from entering the generator enclosure.

Background:

This is to permit designs of generator enclosures where the enclosure only houses a generator and fuel vapours are prevented from entering the enclosure.

1.2.4 Clause 5.1.3 is revoked and the following is substituted:

5.1.3

Where the fuel being returned from the engine to the engine supply tank is at a temperature higher than 38 °C (100°F), the return line shall be connected to a drop tube that extends to a maximum of 15 cm (6 in) from the bottom of the tank and a means to prevent fuel from siphoning through the return line shall be installed.

Note: See Clause 6.4.

Background:

A failure in the return line may result in fuel siphoning through the return line. An anti-siphon valve shall not be installed in the return line. A common practice is to install a hole at the top of the drop tube inside the tank to break the siphon.

1.2.5 Clause 5.2 is revoked and the following is substituted:

5.2 Stainless steel tubing and fittings

A double-ferrule compression fitting and tubing system of stainless construction may be used for piping between a supply tank and the engine to which it is connected.

Background:

Some manufacturers have received TSSA approval. Consult TSSA prior to installation to verify that the fitting is approved.

1.2.6 Clause 6.2 is amended by adding the following:

6.2.5

An electrically powered overfill protection device for tanks supplying generators shall be provided with continuous power. A battery powered overfill protection device shall be provided with an alarm to indicate low battery power and an alternative power source.

Note: Tying into the generator circuit and main power, or tying into the generator's battery, is acceptable.

Background:

Battery powered overfill protection devices are required to be provided with back-up power if the battery fails.

1.2.7 Clauses 6.4.2 and 6.4.3 are revoked.

Background:

The maximum temperature to maintain the tank less than 38°C is consistent with the Ontario Fire Code for Class 2 products.

1.2.8 Clause 6.4.4 is revoked and the following is substituted:

6.4.4

Where an engine supply tank is located outdoors, including sub-base tanks and tanks located inside an engine enclosure, the oil temperature in an engine supply tank may exceed 38°C (100°F), provided that the engine supply tank installation complies with the requirements of the Ontario Fire Code for Class 1 flammable liquid products.

Note: Fuel oil temperatures in engine supply tanks can exceed 38°C due to outdoor ambient and solar heating, as well as due to engine return oil heating.

Background:

The Ontario Fire Code includes clearance requirements from property lines, buildings, and building openings.

1.2.9 Clause 6.6.3 is amended by adding the following:

6.6.3.1

Prior to installation, the design of a siphon protection system described in sections 6.6.3.1(b), (c), (d) and (e) shall be submitted to the authority having jurisdiction for approval.

Background:

These types of installation have a complexity that require TSSA approval prior to use.

1.2.10 Clause 7.2.3(a) is revoked and the following is substituted:

7.2.3

...

(a) the intake combustion air dampers and the ventilation air dampers, if provided separately, are sized for a maximum face velocity of 2.5 m/s (500 fpm);

Background:

The maximum face velocity has been corrected to be consistent with section 7.2.3 of CSA-B139.1.0.

1.3 Amendments to CSA B139.1.2-15 “General requirements for special installations” are as follows:

1.3.1 Section 5 is revoked and the following is substituted:

5. Field installation of burners

The site installation of burners including combustion control systems and fuel-oil control trains, other than those certified for the unit, shall be submitted to the authority having jurisdiction for Field Approval prior to use.

Background:

The installation of unapproved burners are required to comply with the TSSA Field Approval Code as required in section 28 of O. Reg. 213/01.

1.4 Amendments to CSA B139.2-15 “Installation code for oil-burning equipment for residential and small commercial buildings” are as follows:

1.4.1 Clause 4.2.1 is revoked and the following is substituted:

4.2.1

Oil-burning equipment, including appliances, accessories, equipment, components, tanks, and any other thing associated with the oil-burning equipment, shall meet the requirements of this Code, and shall be approved and installed for its intended use in accordance with the manufacturer’s instructions and this Code.

Where there is a conflict between this Code and the manufacturer’s instructions, whichever is more stringent shall apply.

Background:

A difference in requirements between the Code and the manufacturer’s instructions is not a conflict if the requirements of both documents can be met.

1.4.2 Section 4.16 is amended by adding the following:

4.16.3

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 written confirmation by an Oil Burner Technician I or II (as appropriate for the appliance input rating) that it is fit for continued use.

1.4.3 Clause 5.1.2 is revoked and the following is substituted:

5.1.2

An oil-line-mounted fuel-containing device, component, or accessory with a casing that has a melting point of less than 538°C (1000°F) may be installed in an oil supply line when the device is

- (a) installed in a part of the oil line so that the bottom of the device is higher than the top of the tank and operates under negative pressure at the location of the device; or
- (b) protected by a fusible-link shut-off valve with a casing capable of withstanding 538°C (1000°F) and a fusible-link temperature rating not exceeding 177°C (350°F). This valve shall be installed immediately adjacent to the fuel containing device and between the fuel-containing device and the tank.

Background:

References to US standards have been removed since they are not recognized by the Standards Council of Canada.

1.4.4 Clause 5.3 is revoked and the following is substituted:

5.3 Joints and connections

Piping and tubing joints and connections shall be made in accordance with the following:

- (a) Joints and connections shall be made fuel-oil-tight.
- (b) Joints and connections shall be made with standard pipe fittings. All standard threaded fittings shall be
 - (i) malleable iron which shall comply with ANSI/ASME B16.3, Malleable Iron Threaded Forgings: Classes 150 and 300", or ANSI/ASME B16.39, Malleable Iron Threaded Pipe Unions: Classes 150, 250 and 300"; or
 - (ii) cast brass or bronze which shall comply with ANSI/ASME B16.15, "Cast Copper Alloy Threaded Fittings: Classes 125 and 250".
- (c) Brazed connections shall be made by qualified personnel in accordance with ASME Boiler and Pressure Vessel Code Section IX or as otherwise required by the authority having jurisdiction.
Note: *All concealed piping should be brazed, wherever possible.*
- (d) A joint in seamless copper, or stainless steel tubing shall be
 - (i) made by means of a flare joint or solder fitting with a material having a melting point exceeding 538°C (1000°F); or
 - (ii) brazed with a material having a melting point exceeding 538 °C (1000°F).
- (e) Flare nuts shall be forged.
- (f) Compression fittings shall not be used

Background:

It is clarified that solder fittings shall use materials with a melting temperature exceeding 538°C (1000°F).

1.4.5 Clause 6.2.1.2 is revoked and the following is substituted:

6.2.1.2

Tanks shall not be reused, except if it is in good condition and the standard to which it was originally certified has not changed.

Background:

Information on the most current edition of standard is available from the Standards Council of Canada or from the standards writing organization that published the previous edition. Once a new edition of the standard is published, a variance application may be submitted to request for the tank to be reused.

1.4.6 Clause 6.2.1 is amended by adding the following:

6.2.1.3

Steel tanks shall be provided with

- (a) a double bottom tank construction consisting of the tank shell and double contained heads, with a minimum coverage of 50 mm above the bottom of the tank, and a visual interstitial monitoring device located above the highest level of the tank;
- (b) non-combustible secondary containment; or
- (c) a minimum 300° integral secondary containment with monitoring of the interstitial space.

Background:

This applies to both indoor and outdoor tank installations.

1.4.7 Clause 6.2.2.2 is revoked and the following is substituted:

6.2.2.2

All tanks shall be provided with a fill opening or a fill pipe. The fill pipe material shall comply with Clause 5. Fill pipe openings on all tanks shall not be located higher than 4.15 m (13 ft) above the bottom of the storage or supply tank, unless the installation is in compliance with Clause 10.5.1.2 or 10.5.1.3 of CSA-B139.1.0.

Background:

Additional requirements apply if the fill pipe termination is higher than 4.15 m and lower than 7 m from the bottom of the tank. Additional requirements apply if the fill pipe termination is more than 7 m from the bottom of the tank as specified in clause 10.5.1.3.

- 2.** The TSSA **Field Approval Code**, TSSA-FA-2016, is adopted for the approval of assembly or construction of an appliance.

This amendment is effective July 1, 2016.

DATED at Toronto this 4th day of April, 2016

ORGINIAL SIGNED

John Marshall

Director, O. Reg. 213/01 (Fuel Oil)

*Any person involved in an activity, process or procedure to which this document applies shall comply with this document.
This document was developed in consultation with the TSSA Liquid Fuels Advisory Council and Fuel Oil Risk Reduction Group*