Fuels Safety Program	Ref. No.: FS-253-24
Oil and Gas Pipeline Systems Code Adoption Document Amendment	**Date: August 6, 2024**

IN THE MATTER OF:

Technical Standards and Safety Act, 2000, R.S.O. 2000, c. 16, Ontario Regulation 223/01 (Codes and Standards Adopted by Reference), and Ontario Regulation 210/01 (Oil and Gas Pipeline Systems)

The Director for the purposes of Ontario Regulation 210/01 (Oil and Gas Pipeline Systems), pursuant to sections 8(1) and 8(2) of Ontario Regulation 223/01 (Codes and Standards Adopted by Reference) hereby provides notice that the OIL AND GAS PIPELINE SYSTEMS CODE ADOPTION DOCUMENT published by Technical Standards and Safety Authority dated June 1, 2001, as amended, is further amended as follows:

Background:

This amendment to the Oil and Gas Pipeline Systems Code Adoption Document (CAD) revokes and replaces the previous amendment (FS-2538-20, published December 8, 2020, effective February 8, 2021).

The following are the most significant changes from the previous CAD amendment:

- New edition of the Oil and Gas pipeline Systems Code, CSA Z662-23, is adopted.
- New edition of the Security Management for Petroleum and Natural Gas industry Systems Code, CSA Z246.1-21, is adopted.
- Reaffirmed edition of the Damage Prevention for the Protection of Underground Infrastructure, CSA Z247-15 (R2020) is adopted.

All sections of the Oil and Gas Pipeline Systems Code Adoption Document dated June 1, 2001, are hereby replaced with the following, and all previous amendments thereto are thereby superseded.

Where there is a conflict between this document and a code, standard or publication adopted by this document, this document prevails.

Section 1: Codes Adopted by Reference

The Director hereby adopts and requires all persons to whom O. Reg. 210/01 (Oil and Gas Pipeline Systems) applies to comply with the standards, procedures, and other requirements of the following codes:

1) **CSA Z662-23 (Oil and Gas Pipeline Systems)**, published by the Canadian Standards Association, as amended by Section 2 of this document.
2) **CSA Z246.1-21 (Security Management for Petroleum and Natural Gas Industry Systems)**, published by the Canadian Standards Association.
3) **CSA Z247-15 (R2020) (Damage Prevention for the Protection of Underground Infrastructure)** published by the Canadian Standards Association.

Section 2: Amendments to CSA Z662-23 (Oil and Gas Pipeline Systems)

The following clauses and/or sections of the CSA-Z662-23 (Oil and Gas Pipeline Systems) are amended as follows:

(1) Clause **1.2** is revoked and substituted by the following:

The scope of this Standard, as shown in Figures 1.1 and 1.2, includes

(a) for oil industry fluids, piping and equipment in onshore pipelines, tank farms, pump stations, pressure-regulating stations, and measuring stations;

(b) oil pump stations, pipeline tank farms, and pipeline terminals;

(c) pipe-type storage vessels;

(d) for gas industry fluids, piping and equipment in onshore pipelines, compressor stations, measuring stations, hydrogen blending facilities, and pressure-regulating stations;

(e) gas compressor stations; and

(f) gas storage lines and pipe-type and bottle-type gas storage vessels;

Notes:

1) Gas industry fluids from renewable natural gas (RNG) and other production facilities are included in Item (d).
2) Measuring and pressure-regulating stations that include blended gas industry fluids are included in Item (d).

(2) Clause **1.3** is amended by adding the following items:

(q) gathering systems;

(r) digester gas or gas from landfill sites or waste gas within the boundary of the site;

(s) multiphase fluid systems;

(t) offshore pipeline systems;

(u) oil field water systems;

(v) oilfield steam systems; and

(w) carbon dioxide pipeline systems.

(3) Clause **2.2** is amended by adding the following sentence to the definition of Line, Transmission: Transmission pipelines are those lines that operate at or above 30% of the pipe's specified Minimum Yield Strength (SMYS) at Maximum Operating Pressure (MOP).

(4) Clause **4.1.9** is revoked, except for the note, and substituted with the following:

Steel oil and gas pipelines may be designed in accordance with the requirements of Annex C, provided that such designs are suitable for the conditions to which such pipelines are to be subjected, and provided that the design has been reviewed and approved by the Director prior to installation or use.

(5) Clause **4.3.4** is amended by adding the following clauses:

4.3.4.9 High consequence areas

4.3.4.9.1 Definitions

The following definitions apply to clause 4.3.4.9:

Assessment means the use of testing techniques set out in this section to ascertain the condition of a covered pipeline segment.

Covered segment or **Covered pipeline segment** means a segment of oil or gas transmission pipeline located in a high consequence area.

High consequence area means

(a) for a gas transmission pipeline, an area defined as:

(i) a Class 3 location as set out in Clause 4.3.3 and Table 4.1;

(ii) a Class 4 location as set out in Clause 4.3.3 and Table 4.1;

(iii) any area in a Class 1 or Class 2 location where the potential impact radius is greater than 200 metres and the area within the potential impact circle contains 20 or more buildings intended for human occupancy; or

(iv) any area in a Class 1 or Class 2 location where the potential impact circle contains an identified site; and

(b) for an oil pipeline, an area containing:

(i) a commercially navigable waterway, which means a waterway where a substantial likelihood of commercial navigation exists;

(ii) a high population area, which means an urbanized area, as defined, and delineated by the latest Statistics Canada Census, that contains 50,000 or more people or has a population density of at least 385 people per square km;

(iii) any other populated area and/or place, as defined by the latest Statistics Canada Census, that contains a concentrated population, such as an incorporated or unincorporated city, town, village, or other designated residential or commercial area; or

(iv) an unusually sensitive area, as defined in the owner/operator's pipeline integrity management program.

Identified site means, for Class 1 and Class 2 locations, any of the following areas:

(a) an outside area or open structure that is occupied by twenty (20) or more persons on a minimum of fifty (50) consecutive or non-consecutive days in any twelve-month (12) period. Examples include but are not limited to beaches, playgrounds, recreational facilities, camping grounds, outdoor theaters, stadiums, recreational areas near a body of water, and areas outside rural buildings such as a religious facility;

(b) a building that is occupied by twenty (20) or more persons on a minimum of five (5) consecutive or non-consecutive days in any given week for at least ten (10) weeks in any twelve-month (12) period. Examples include, but are not limited to, religious facilities, office buildings, community centers, general stores, 4-H facilities, sporting, and entertainment facilities; or

(c) a facility occupied by persons who are confined, or are of impaired mobility, or that would be difficult to evacuate. Examples include but are not limited to hospitals, prisons, schools, day-care facilities, retirement facilities and assisted-living facilities.

Potential impact circle, for natural gas or HVP pipelines systems, is a circle of radius equal to the potential impact radius (PIR).

Potential impact radius (PIR) means the radius of a circle within which the potential failure of a pipeline could have significant impact on people or property, determined by the following formula:

r = 0.00313 times square root of (pd^2) where:

r is the radius of the circular area surrounding the point of failure in meters (m)
p is the MOP of the pipeline in kPa
d is the nominal diameter of the pipeline in mm

Note: 0.00313 is the factor for natural gas based on conversion from a formula used in GRI-00/0189. This number will vary for other gases depending upon their heat of combustion. An operator transporting gas other than natural gas shall refer to ASME/ANSI B31.8 S for the formula to calculate the potential impact radius.

4.3.4.9.2 Identification of high consequence areas

(a) *General:* Operating companies shall identify which segments of their oil and gas transmission pipeline system are in high consequence areas. The operator must describe in its integrity management program the method used to establish high consequence areas, including the determination of the potential impact radius.

(b) *Identified sites:* The operator shall identify *identified sites* by:

(i) using information the operator has obtained from routine operation and maintenance activities; and

(ii) obtaining information about locations that are likely to meet the criteria for *identified sites* from public officials with safety or emergency response or planning responsibilities (such as officials from local emergency planning response agencies or from municipal planning departments).

(c) *Identified sites – where public officials cannot assist:* If the public officials described in clause 4.3.4.9.2 are unable to provide information necessary to identify potential *identified sites,* the operator shall review and use the following information, as appropriate, to identify potential *identified sites*:

(i) the presence of signs, public notices, flags, or other markings that suggest that the area may qualify as an identified site; and

(ii) the existence of publicly available information, including online and at local land registry offices, that suggests the area may qualify as an identified site.

(d) *Newly identified high consequence areas*: When an operator obtains information indicating that the area around a pipeline segment not previously identified as a high consequence area could constitute a high consequence area, the operator shall evaluate the area to determine if the area is a high consequence area. If the segment is determined to constitute a high consequence area, it must be incorporated into the operator's baseline assessment plan as a high consequence area within one year from the date the area is identified.

Note: Pipeline operators shall keep records of the above requirements pursuant to clause 3.1.2 (f) (v), pipeline system integrity management.

4.3.4.10 Operator's responsibility to implement this clause

4.3.4.10.1

An operator of a covered pipeline segment shall develop and follow a written program (as part of the pipeline system integrity management program (IMP)) that contains all the elements described in the IMP and that addresses the risks associated with each covered transmission pipeline segment.

4.3.4.10.2 Implementation standards

An operator may use an equivalent standard or practice as required by clause 4.3.4 only when the operator demonstrates in its IMP that the alternative standard or practice provides an equivalent level of safety to the public and property.

4.3.4.11 Risk assessment

The operator shall conduct a risk assessment that follows Annex B Guidelines for risk assessment of pipelines falling within the scope of CSA Z662-23 for each covered segment. The risk assessment shall include the high consequence areas and determine if additional preventive or mitigation measures are needed.

The operator shall prioritize the covered pipeline segments according to risk.

4.3.4.12 Remediation

For each covered segment, the operator shall develop and establish all reasonable measures to prevent or

reduce the probability of an incident and to limit the potential consequences thereof.

These measures shall include conducting a risk analysis of the pipeline segment to identify additional measures to enhance public safety or environmental protection. Such measures may include, but are not limited to:

(a) establishing shorter inspection intervals;
(b) installing emergency flow restricting devices (remote operated valves, check valves and automatic shut off valves, as applicable);
(c) modifying the systems that monitor pressure or detect leaks, as applicable;
(d) providing additional training to personnel on response procedures;
(e) conducting drills with local emergency responders; and
(f) adopting other management controls.

Evacuation procedures shall take into consideration the PIR.

For oil pipeline segments located in high consequence areas, the operating company shall provide the Ontario Ministry of Natural Resources and Forestry (MNRF) and the Ontario Ministry of the Environment, Conservation and Parks (MECP) an opportunity to comment on the company's contingency plan for leaks or spills and shall address any comments provided by MECP or MNRF.

(6) **Table 4.2** is amended by substituting the requirements for LVP multiphase (non-sour services) and LVP liquid and quasi-liquid hydrocarbon (with low flammability) with the following:

Application	**Class 1 location**	**Class 2 location**	**Class 3 location**	**Class 4 location**
Transmission lines (refined products)	1.000	0.900	0.700	0.550
Uncased railway crossings	0.625	0.625	0.625	0.625
All except Transmission lines (refined products) and Uncased railway crossings	1.000	1.000	1.000	1.000

(7) Clause **7.10.3.2** is revoked and substituted with the following:

For HVP pipeline systems, all butt welds shall be inspected by radiographic or ultrasonic methods, or a combination of such methods, for 100% of their circumferences, in accordance with the requirements of clause 7.10.4.

(8) Clause **10.3.7.1** is revoked, except for the notes, and substituted with the following:

Prior to a change in service fluid, including non-sour service to sour service, or gas to hydrogen or hydrogen blend service, the operating company shall conduct an engineering assessment to determine whether the pipeline systems would be suitable for the new service fluid. The assessment shall include consideration of the design, material, construction, operating, and maintenance history of the pipeline system and shall be submitted to the Director for approval.

(9) Clause **10.5.1.1** is amended by adding the following sub-clause:

10.5.1.1(f)

(f) develop written procedures for periodically determining the depth of cover for pipelines that operate at over 30% SMYS of the pipe at MOP. Such written procedures shall include a rationale for the frequency selected and the percentage of the pipeline that was checked for such depth determinations. Where the

depth of cover is found to be less than 60 cm in lands being used for agriculture, an engineering assessment shall be done in accordance with clause 3.4 and a suitable mitigation plan shall be developed and implemented to ensure the pipeline is adequately protected from hazards.

(10) Clause **10.5.2** is amended by adding the following clauses:

10.5.2.5 Emergency communication meetings

The operator of a transmission pipeline shall conduct meetings with local authorities and shall invite police, firefighting authorities, Ontario Ministry of Transportation (MTO), Ministry of Natural Resources and Forestry (MNRF), Ministry of the Environment, Conservation and Parks (MECP), local conservation authorities and TSSA, to those meetings to explain to the authorities the characteristics of the pipeline system the operator operates, the type of fuels being transported and the typical behavior of these fuels in case of uncontrolled escapes or spills and the capabilities and the coordination required to respond to pipeline emergencies.

These meetings shall be conducted at intervals not exceeding five years at locations that ensure the key stakeholders can attend. The meetings shall be prioritized to correspond to the operating company's prioritization of the covered pipeline segments according to the risk.

10.5.2.6 Emergency Response Plan

Operating companies shall prepare an emergency response plan and make it available on request to the authorities referred to in clause 10.5.2.5.

(11) Clause **10.6** is amended by adding the following clause:

10.6.7 Right-of-way encroachment

10.6.7.1

No person shall construct, erect, or install any structure or tangible item on or within the pipeline right-of-way, including but not limited to patios, concrete slabs, buildings, pool houses, garden sheds, swimming pools, hot tubs, fish or other man-made ponds, saunas, or fences, unless written permission is first obtained from the operating company.

10.6.7.2

No person shall deposit or store any flammable material, solid or liquid spoil, refuse, waste, or effluent on or within the pipeline right-of-way.

10.6.7.3

Notwithstanding the above, operating companies may erect structures required for the purpose of pipeline system operation on the pipeline right-of-way.

10.6.7.4

No person shall operate a vehicle or mobile equipment except for farm machinery or personal recreation vehicles across or within a pipeline right-of-way unless written permission is first obtained from the operating company, or the vehicle or mobile equipment is operated within the travelled portion of a highway or public road already existing in the pipeline right-of-way.

(12) Clause **10.15.1.2** is amended by adding the following items:

(e) maintain warning signs and markers along the pipeline right-of-way;

(f) maintain existing fences around above ground pipeline facilities; and

(g) empty tanks and purge them of hazardous vapours within 60 days of deactivation.

(13) Clause **12.4.11.1** is renumbered as clause 12.4.11.1.1. Clause **12.4.11** is amended by adding the following clauses:

12.4.11.1.2

All new and replacement natural gas service regulators shall comply with the requirements of CSA 6.18-02 (R2022) (Service Regulators for Natural Gas), published by the Canadian Standards Association, including the Drip and Splash Test contained in Appendix A of the said standard.

Where a regulator-meter set installation or supplemental protective devices provides equivalent protection against regulator vent freeze up passes a successful test in accordance with Appendix C of the said standard, the requirements of Appendix A (Drip and Splash Test) and those contained in clause 14.15 (Freezing Rain Test) of the standard are waived.

Evidence of tests completed in accordance with Appendix C of the standard shall be retained by the operating company as permanent records.

12.4.11.1.3

Regulator-meter set configurations shall be included in the operating company's operating and maintenance procedures.

Section 3: Polyethylene Pipe Certification

Polyethylene piping and fittings that are used in a polyethylene gas pipeline shall be certified by a designated testing organization accredited by the Standards Council of Canada as conforming to CSA B137.4 (Polyethylene Piping Systems for Gas Services).

Section 4: Welder Qualification

Welds shall not be made in any steel pipe that forms or is intended to form a part of a steel oil or gas pipeline or a component of a steel pipeline unless the welding procedures have been approved and the welder is qualified to make the weld in accordance with the requirements of CSA Z662-23 (Oil and Gas Pipeline Systems) and is the holder of the appropriate authorization issued under O. Reg. 220/01 (Boilers and Pressure Vessels) made under the Act.

This amendment is effective October 6, 2024.

DATED this 6th day of August 2024.

Kelly Hart
Director, O. Reg. 210/01 (Oil and Gas Pipeline Systems).