



TECHNICAL STANDARDS &
SAFETY AUTHORITY
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IN THE MATTER OF

THE SAFETY AND CONSUMER STATUTES ADMINISTRATION ACT 1996

and

THE TECHNICAL STANDARDS AND SAFETY ACT 2000

TAKE NOTICE THAT:

In accordance with the provisions of the *Technical Standards and Safety Act, 2000*, the attached document entitled, "The Oil and Gas Pipeline Systems Code Adoption Document" has been issued by the Technical Standards and Safety Authority and is intended to be adopted by Oil and Gas Pipeline Systems Regulation.

June 1st, 2001

Mike Philip
Director,
Energy Act



OIL AND GAS PIPELINE SYSTEMS

CODE ADOPTION DOCUMENT

June 1, 2001

OIL AND GAS PIPELINE SYSTEMS CODE ADOPTION DOCUMENT

Issued by: FUELS SAFETY DIVISION
TECHNICAL STANDARDS AND SAFETY AUTHORITY

FOREWORD

The Oil and Gas Pipeline Systems Regulation made under the *Technical Standards and Safety Act* adopts this Code Adoption Document for the Province of Ontario.

Definitions in the Code Adoption Document have the same meaning as the Oil and Gas Pipeline Systems Regulation made under the *Technical Standards and Safety Act*.

The Regulation entitled "Oil and Gas Pipeline Systems" under the TSSA Act adopts and implements this Code Adoption Document for all of Ontario. Part 2 of this Document adopts the CSA Standard Z662-99 "Oil and Gas Pipeline Systems", and CSA Z276-94 Liquefied Natural Gas (LNG) – Production, Storage, and Handling. Part 3 of this Document adopts the National Standard of Canada CAN/CSA-B137.4-92 "Polyethylene Piping Systems for Gas Services".

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.

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Oil and Gas Pipeline Systems Code Adoption Document

Section 1

REFERENCE PUBLICATIONS

1. (1) The reference publications as set forth herein are approved by the Director and adopted as part of this Document and the standards, procedures and requirements therein, as applicable to this Document, shall be complied with by operating companies as well as anyone engaged in the design, construction, erection, alteration, installation, testing, operation or removal of a pipeline, for the transmission of oil or gas or the distribution of gas.

Government of Ontario

TSSA Act, Boilers and Pressure Vessels Safety Regulation.

Canadian Gas Association

Internal Relieved Service Regulators for Natural Gas, CAN/CGA-6.18-M95

Note: Figure 1 titled "Test Setup for Freezing Rain Test" found on page 10 of CGA-6.18-M95 is revoked and replaced by Figure 1 titled "Test Setup for Performance Test" found in page 10 of CAN/CGA-6.18-M91.

Section 2

GENERAL REQUIREMENTS

2. (1) The Standards issued by the Canadian Standards Association entitled Oil and Gas Pipeline Systems Z662-99 and CSA Z276-94 Liquefied Natural Gas (LNG) – Production, Storage, and Handling and the standards, specifications, codes and publications set out therein as reference publications insofar as they apply to the said Standards are adopted as part of this Document (*effective October 1, 2001*), with the following changes for the CSA Z662 Standard:
 - (2) Clause 1.2 is amended by adding the following item:
 - (g) pipelines that carry gas to and from a well head assembly of a designated storage reservoir.
 - (3) Clause 1.3 is amended by adding the following items:
 - (p) digester gas or gas from landfill sites

- (q) multiphase fluids
- (r) gathering lines
- (s) offshore pipeline systems
- (t) oil field steam distribution pipeline systems
oil field water services
- (v) carbon dioxide pipeline systems.

- (4) Clause 4.1.5 is revoked and the following substituted:

4.1.5 Subject to prior review by the Director, it shall be permissible for steel oil and gas pipelines to be designed in accordance with the requirements of Appendix C, provided that the designer is satisfied that such designs are suitable for the conditions to which such pipelines are to be subjected.

- (5) Clause 7.2.8.2.2 is revoked and the following substituted:

7.2.8.2.2 For HVP and for sour service 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 7.2.8.3.

- (6) Clause 10.4.10 is amended by adding the following clauses:

10.4.10.7 Operating companies shall inform agencies to be contacted during an emergency, including the police and fire departments about the hazards associated with its pipelines.

10.4.10.8. Operating companies shall prepare an emergency response plan and make it available to local authorities.

- (7) Clause 10.5 is amended by adding the following clause:

10.5.5 Right-of-Way Encroachment.

10.5.5.1 It shall be prohibited to install patios or concrete slabs on the pipeline right-of-way or fences across the pipeline right-of-way unless written permission is first obtained from the operating company.

10.5.5.2 It shall be prohibited to erect buildings including garden sheds or to install swimming pools on the pipeline right-of-way. Storage of flammable material and dumping of solid or liquid spoil, refuse, waste or effluent, shall be also forbidden.

10.5.5.3 Operating companies shall be allowed to erect structures required for pipeline system operation purposes on the pipeline right-of-way.

10.5.5.4 No person shall operate a vehicle or mobile equipment except for farm machinery and personal recreation vehicles across or along 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.

(8) Clause 10.11.2 is amended by adding the following items:

10.11.2.4. The Director may require operating companies or a person to submit a design, specification, program, manual, procedure, measure, plan or document to the Director if:

- a) the operating company or person makes an application to the Director under Section 14 .(1) 1, 14 (1) 3 and 12 .6 of the Regulation.
- b) the Director has reasons to believe that the design, construction, operation, or abandonment of a pipeline, or any part of a pipeline is or may cause
 - i) a hazard to the safety of the public or to the employees of the operating company;
 - ii) an adverse effect to the environment or to property, or
- c) the Director wishes to assess the operating company's pipeline integrity management program.

10.11.2.5. For the protection of the pipeline, the public and the environment, an operating company shall develop a pipeline integrity management program for steel pipelines operating at 40 % or more of the SMYS. The pipeline integrity management program shall contain:

- a) a management system;
- b) a working records management system;
- c) a condition monitoring program, and
- d) a mitigation program.

10.11.2.6. When developing the pipeline integrity management program, an operating company should consider the following:

a) **In the management system:**

- the program scope, including a description of facilities, goals and objectives;
- the organizational lines of responsibility for the integrity management program, including the reporting requirements to senior management;
- the training of management and staff required to develop and execute the integrity management program;
- the qualifications of consultants and contractors required to develop and execute the integrity management program;
- the methods of keeping abreast of industry practice and current research activities;
- the methods to be used to manage change in respect of the design, construction and operation of the pipeline; and
- the methods to be used to measure the effectiveness of the program.

b) **In the working records management system (RMS):**

- The maintenance of an RMS that would allow timely access, by sections, to records regarding the pipeline system. Where practicable, the RMS should include information on the original pipe and all repairs such as:
 - (i) pipe material, manufacturer and date of manufacture, category, seam and girth weld type, grade, welder identification, non-destructive examination records, heat number, weld maps (e.g. weld number, non-destructive examination type and number),
 - (ii) coating type for line pipe, joints and tie-ins, manufacturer, application method and weather condition at the time of application,
 - (iii) repair history (e.g. location and type of repair, type and specification of sleeves, hot taps, grinding, cut-outs and replacements, type of defects, cut out or repaired, major coating repairs, and re-coating specifications),
 - (iv) mapping (e.g. location of pipelines including class location, depth of cover, location of buried valves and flanges, and geotechnical data),

- (v) all pressure test data and records, maximum operating pressure, construction drawings, in-line inspection (ILI) tool data and reports, corrosion control and cathodic protection records including design and survey results:
- (vi) inspection records of pressure relieving and emergency shutdown devices, and
- (vii) valve inspection records;
 - documentation of condition monitoring and mitigation programs and past condition monitoring and mitigation decision analyses; and
 - review of integrity management program effectiveness as outlined in 10.11.2.6. a).

c) **In the condition monitoring program:**

- an internal inspection with ILI tools (e. g. caliper, metal loss), where such tools are commercially available,
- an engineering assessment (EA) of pipeline segments to address pipeline integrity. Both time dependent (e.g. corrosion, stress corrosion cracking, hydrogen induced cracking and fatigue) and non-time dependent (e.g. manufacturing defects, third party damage and geotechnical (slope stability, and stream washout)) hazards that are to be considered and investigated in the EA. The EA should consider the results of such methods as pressure testing, use of ILI tools and investigative digs.
- The risk assessment (RA) method to be used when assigning priorities for integrity evaluations of facilities or line segments. Factors to be included in the RA are items such as: pipeline age and condition; coating age and condition; cathodic protection data and ILI data. Consideration should be given to determining the area affected (consequence) by a product release;
- where appropriate, monitoring and surveillance programs for slope movement, river crossing, depth of cover, frost heave and thaw settlement;
- a program to minimize third party damage, including line patrols;
- the methods used to evaluate and maintain pipeline integrity and the criteria for their application, which may include:
 - (i) the use of the appropriate ILI tool technology and the methods used to verify ILI findings,
 - (ii) the hydrostatic retesting procedure,
 - (iii) the corrosion control monitoring methods and cathodic protection survey documentation,

- (iv) the method used to evaluate remaining life where defects exist,
- (v) the methods used to verify the coating type and condition, and
- (vi) any other methods utilized for defect detection;

- the procedures used to track, analyze and trend the condition of the pipeline and its coating; and
- the steps to be taken to evaluate the cause of the line or facility failure including the minimum investigation and requirements (e.g. cut-out, metallurgical analysis).

d) **In the mitigation program:**

- the criteria and procedures for evaluation of imperfections and repairs of piping containing defects;
- the procedures for performing consequence analysis to establish repair priorities;
- the criteria and procedures for consideration of such measures as pipe replacement (e.g. cut-out), repair (e.g. grinding, sleeving (steel or fiberglass)), hot taps, hot work, excavation procedures, maintenance welding, recoating, hydrostatic retesting and reduction in operating pressure (temporary or permanent); and
- an outline of the short term (e.g. 1 to 3 year(s)) and long term (e.g. 4 to 10 years) mitigation program plans and priorities.

NOTE: The requirements of clauses 10.11.2.4 and 10.11.2.5 will not be mandatory until June 27, 2003

(9) Clause 10.11.3.1 is revoked and the following substituted:

10.11.3.1 Where changing the service of a pipeline system to a new service fluid, an engineering assessment shall be conducted to determine the suitability of the pipeline system for the new service fluid. The assessment shall include consideration of the design, material, construction, operating, and maintenance history of the pipeline system and submitted to the Director for approval.

(10) Clause 10.13.1.2 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.

(11) Clause 12.4.8.1 is renumbered as clause 12.4.8.1.1. Clause 12.4.8 is amended by adding the following clauses:

12.4.8.1.2 All new and replacement natural gas service regulators shall comply with the requirements of CAN/CGA-6.18-M95 standard, Internal Relieved Service Regulators For Natural Gas, including the Drip and Splash Test contained in Appendix A of the said Standard. Where a regulator – meter set installation or supplemental protective devices as providing equivalent protection against regulator vent freeze up passes a successful test in accordance to Appendix F of the Standard, the requirements of Appendix A (Drip and Splash Test) and those contained in Clause 2.14 (Freezing Rain Test) of the Standard are waived. Evidence of test made in accordance with Appendix F, shall be kept by the operating Company as permanent records.

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

(12) Clause 12.10.9(b) is revoked and the following substituted:

12.10.9(b) For Class 1 and Class 2 location, the upgraded maximum operating pressure shall not exceed the design pressure calculated in accordance with the requirements of Clause 12.4.2.1; and

(13) Clause 12.10.9 is amended by adding the following:

12.10.9(d) For Class 3 and Class 4 location, the upgraded maximum operating pressure shall not exceed the design pressure calculated in accordance with the requirements of clause 12.4.2.1.1 with a combined design factor and temperature derating factor ($F \times T$) of 0.32.

Section 3

POLYETHYLENE PIPE CERTIFICATION

Effective October 1, 2001

3. (1) Polyethylene pipe 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 the CAN/CSA-B137.4-92 Polyethylene Piping Systems for Gas Services.

Section 4

WELDER QUALIFICATION

4. (1) 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 welder is qualified to make the weld in accordance with the requirements of the Standard adopted under section 2 of this Document and is the holder of an authorization issued under the Boilers and Pressure Vessels Safety Regulation.

Section 5

5. (1) Where there is a conflict between a standard, specification, code or publication adopted in sections 1, 2 and 3 of this Document, this Document prevails.