N633: CSA Z662 Oil and Gas Pipeline Systems Code

Tutor(s): Instructor biography coming soon

2 Days	Competence Level: Awareness
Classroom Course	

Summary

This two-day course will provide participants with a high level understanding of the Canadian Standards Association CSA Z662 Oil and Gas Pipeline Systems Standard, with an emphasis on practical application of the standard to oil and natural gas pipelines and facilities over the complete lifecycle from design, construction and operation in onshore areas. The course will discuss how the CSA Z662 standard and pipeline regulations act together and it will also highlight differences in key areas between CSA Z662 and ASME B31.3. The course is designed for pipeline engineers, technologists, inspectors or other professionals who require a working knowledge of the standard. Participants are encouraged but not required to bring a copy of the Standard (not included in course fees) to the sessions.

Learning Outcomes

Participants will learn to:

1. Understand how CSA Z662 is developed and how the standard and pipeline regulations interact to contribute to pipeline system safety;
2. Learn the practical application of CSA Z662 to the pipeline system lifecycle from design, construction, operation, maintenance and abandonment;
3. Become aware of Safety and Loss Management System, Integrity Management Program and Engineering Assessment concepts;
4. Obtain foundational knowledge of CSA Z662 pipeline design and material requirements;
5. Understand when ASME B31.3 may be used within a CSA Z662 design and the key differences;
6. Learn the main requirements for construction, welding, pressure testing and corrosion control and their practical applications;
7. Recognize operations and maintenance requirements and relevant issues such as safety considerations and procedures and records requirements;
8. Learn the requirements for imperfection evaluations, acceptable repair methodologies, deactivation, reactivation and abandonment; and
9. Obtain a working knowledge of the application of the standard through the use of examples and contextual discussion of the intent of the clause.

Duration and Training Method

Two classroom days providing 1.6 CEU (Continuing Education Credits) or 16 PDH (Professional Development Hours)

Who Should Attend

The course is designed for both new and experienced pipeline engineers, technologists, inspectors and other professionals who require a working knowledge of the standard. The practical examples discussed during the course will enable all participants to gain an understanding of the application of the standard.

Course Content

Course Agenda
Day One - (Clauses 1 to 6 of CSA Z662)
1. Introduction to CSA

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a. Clarify who/what CSA is
b. Discuss the standard development process
c. Explain how the standard becomes law and interacts with regulations
d. How to request formal interpretations and changes

2. Scope (Clause 1)
a. What is covered and excluded from CSA requirements
b. Discuss if there are retroactivity requirements
c. How to deal with products or processes not referenced in the standard
d. Clarify what is mandatory language and when Notes are mandatory
e. Brief introduction to the annexes and highlights which are mandatory

3. Terminology (Clause 2)
a. Cover some key definitions
b. Explain the concept of hoop stress and specified minimum yield stress
c. Introduction to Engineering Assessment

4. Safety and Loss Management System (Clause 3)
a. Discuss the key elements of a safety and loss management system
b. Describe the key elements of an integrity management program
c. Details on Engineering Assessment requirements

5. Design (Clause 4)
a. Cover the various design loads and conditions that must be considered
b. Explain Class Location determination
c. Explore pressure design determination– hoop stress and combined stress
d. Analyze valve spacing requirements
e. Discuss cover, clearance and crossing requirements
f. Briefly cover compressor and pump station design considerations
g. Examine over pressure protection requirements
h. Consider leak detection requirements

6. Materials (Clause 5)
a. Discuss notch toughness requirements and the rationale
b. Clarify acceptable reuse of material considerations
c. Highlight requirements for records of materials

7. Construction (Clause 6)
a. Detail the requirements throughout the construction lifecycle such as:
b. Examine pipe transportation, right of way clearing, ditching lowering in and backfill
c. Describe Crossing considerations related to bored and horizontal directional drill (HDD)
d. Discuss mandatory inspection requirement

8. Joining (Clause 7)
a. Describe joining and relevant welding processes

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Day Two - (Clauses 7 to 10 & 16 of CSA Z662)

9. Joining (cont.) (Clause 7)
 a. Analyze the development of a welding procedure specification (WPS)
 b. Explain how to qualify a welder according to CSA requirements
 c. Discuss production welding considerations
 d. Highlight requirements for Inspection of Welds
 e. Cover types of non-destructive examination (NDE) methods
 f. Detail mandatory visual and NDE requirements
 g. Discuss in-service welding requirements

10. Pressure Testing (Clause 8)
 a. Discussion on why pressure testing is required
 b. Explain safety considerations associated with pressure testing
 c. Cover testing procedures and techniques
 d. Describe appropriate duration and pressures for both strength and leak tests
 e. Analyze how to determine maximum operating pressure
 f. Highlight pressure test medium considerations

11. Corrosion Control (Clause 9)
 a. Cover external corrosion control requirements
 b. Discuss external pipe coating considerations
 c. Highlight cathodic protection requirements
 d. Cover internal corrosion susceptibility determination
 e. Describe internal corrosion condition monitoring and mitigation requirements

12. Operations (Clause 10)
 a. Highlight safety considerations during operation
 b. Discuss integrity management and engineering assessment requirements
 c. Cover leak detection requirements and considerations
 d. Examine mandatory records and procedures
 e. Discuss pipeline emergency and ground disturbance requirements
 f. Right of way inspection and maintenance requirements
 g. Explain what to do when a Class location changes
 h. Explore evaluation of imperfections and acceptable repair methodologies
 i. Detail deactivation, reactivation and abandonment

13. Sour Service Pipe (Clause 16)
 a. Discussion on the interaction of Clauses 3 to 10 and Sour Service Clause 16
 b. Examine the definition and how to determine sour service
 c. Cover the sour service requirements from design, materials, construction, joining, pressure testing and operations