Canadian Standards System Overview and the Development of CSA Group Standards for the Oil and Gas Industry

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Overview of CSA Group

- Established in 1919
- Private, not-for-profit

Consumer Product Evaluation

Standards

Product Certification & Testing

North America
Canada, USA, Mexico

Europe
Switzerland, Netherlands, Italy, UK, Germany

Middle East
Turkey

Asia
China, Korea, & Taiwan

India
A Trusted Advisor

• 35 offices in 14 countries
• 88,000 customers globally
• CSA mark appears on billions of products worldwide
• 8,000 engaged and committed Members
• 1,300 standards development Technical Committees
• 3,000+ standards in 54 technologies and services
CSA Standards

- Accredited in Canada and U.S.
- Partner with industry, regulators, government, academia and consumers
- Members volunteer their time and develop standards
- Reputation as honest broker (e.g. accredited process, consensus approach)
- Experience with sensitive topics (e.g. Privacy, Nuclear Safety, Mental Health)
- Major role in emerging technologies (e.g. Electric Vehicles, Nanotechnology)
- Offer training, education and certification to over 6,000 people per year
Global Business Units

Consumer Product Evaluation

Hazardous Locations & Industrial Products

Appliances & Gas

Plumbing & Construction
and Lighting & Wiring

Medical, Safety & Technology

Alternative Energy & Sustainability

Automotive/Transportation
Canada’s network of organizations involved in development, promotion, and implementation of standards include:

- Standards Development Organizations
- Certification Bodies
- Testing & Calibration Laboratories

This network is administered by the Standards Council of Canada (SCC)
Accredited Standards Development Organizations

Subject Area Recognition
Value of a Standards-Based Approach

• Complements policy and Regulations
  - Can be referenced as technical building blocks within Regulations
  - Supports harmonization nationally and internationally

• Complements and adds value to existing initiatives
  - Levels the playing field
  - Establishes a common language
  - Facilitates benchmarking and reporting

• Increases credibility and transparency
  - Builds trust and cultivates relationships and collaboration
  - All interest groups are represented, using a consensus process
  - High degree of outcome predictability
Objectives of Standardization

- Assist and Protect Consumers
- Advance National Economy
- Support Sustainable Development
- Strengthen International Cooperation
- Facilitate Domestic and International Trade
- Improve the Health and Safety of Workers and Public
Oil & Natural Gas Pipeline Systems
• The National Standard for the design, construction, and operation of pipelines in Canada Adopted into law as part of various provincial and national regulation

Natural Gas & Propane & Oil Codes
• Definitive resource for gas and propane industry workers across Canada
• Typically adopted into law by provinces and territories shortly after release

Canadian Electrical Code
• Key electrical safety document in Canada for 80 years
• Used by regulators, contractors, and manufacturers

Occupational Health & Safety Standards
• Many standards adopted into regulation (e.g. fall protection, workplace electrical safety, use of electricity in mines, chain saws, etc.)
The Standards Process

- Developed by experts on a consensus basis
- Balanced Matrix: Representatives from industry, regulators, NGOs, academics and consultants
- Automatic 5-year review
- Compliance (e.g. regulator; independent 3rd party)

Value Proposition:

- **Public Acceptance** by way of inclusive input and transparency
- Stakeholder engagement and **compliance**
- Process, regulatory, and financial **efficiency**
- **Harmonization**
## Benefit to Energy Sector

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>Performance</strong></td>
<td>Harmonization of approaches / technologies drive costs down while improving environmental performance.</td>
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<td><strong>Reputation</strong></td>
<td>Strategic development of credible, transparent standards beyond regulation.</td>
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<td><strong>Due Diligence</strong></td>
<td>Can serve as political, regulatory, legal and financial due diligence mechanism.</td>
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<tr>
<td><strong>Process</strong></td>
<td>Bottom-up, industry/expert-led consensus process results in credible, practical standards.</td>
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Relevant Existing Standards

- CSA Group publishes many Standards relevant to the Energy & Utilities sector:
  - Electrical
  - Petroleum & Natural Gas Industry Systems
  - Fuel Burning Equipment
  - Occupational Health and Safety
  - Sustainability
  - Quality
  - Risk Management
  - Corporate Social Responsibility
  - Built Environment
  - Renewable Energy
  - Fuel Cells
  - Alternative Energy Vehicles
  - Industrial Energy Efficiency
  - Energy Management
  - Nuclear
Overview

- 45+ years old
- 20 active committees comprising of more than 400 expert volunteer members
- Covers 11 distinct program areas

✓ **CSA pipeline standards are adopted by all regulatory agencies across Canada**
Petroleum & Natural Gas Program

Program Areas

- Security Management
- Oil & Gas Pipeline Systems
- Emergency Preparedness & Response
- Land Use Planning for Pipelines
- Damage Prevention
- Storage of Hydrocarbons in Underground Formations
- Well Design
- Pipeline Materials
- Emissions
- Coatings for Steel Pipe
- Liquefied Natural Gas
Committees Organization Chart

CSA Standards Policy Board

Strategic Steering Committee

- TC on Pipeline Systems and Materials
- TC on Liquefied Natural Gas (LNG)
- TC on Underground Storage
- TC on Security & Emergency Management

TC on Damage Prevention
- TC on Emissions
- TC on Well Design

Regulatory Authority Committee

TC = Technical Committee
# Petroleum & Natural Gas Program

## Current Program
- Oil and Gas Pipeline Systems
- Security Management
- Emergency Management
- Coatings for Steel Pipe
- Field-applied Coatings
- Pipeline Materials
- Liquefied Natural Gas
- Storage of Hydrocarbons in Underground Formations
- Land Use Planning for Pipelines

## New Projects Underway
- Damage Prevention
- Flaring and Venting
- Fugitive Emissions
- Well Design
- Pipeline Human Factors

## Future Projects
- Well operations
- Measurement & production accounting
- Processing plant design & operation
- Field facilities design and operation
- Environmental effects
- Hydraulic fracturing
Pipeline Human Factors

- Feedback from industry identified an immediate need for a document to provide guidance on human factors for the pipeline industry.

- Work will commence this month, publication by Fall 2015.

- The document will provide an overview of the tools and techniques for human factors assessment and mitigation along the lifecycle of a pipeline, and help establish benchmarks for human error:
  - e.g. human-machine interface, SCADA automation systems in pipelines.
• New CSA standard Z247, *Damage prevention for the protection of underground energy and utility networks*, will establish best practices around damage prevention

• Scheduled to publish in May 2015

• Offers standardized language and process to locate and mark underground infrastructure

• Scope includes excavation and backfilling, documentation, auditing, training and competency
Security & Emergency Management

• Two key standards in CSA’s portfolio cover security & emergency management for Canada’s oil and gas industry:
  • Z246.1-13, *Security management for petroleum & natural gas industry systems*
  • Z246.2-14, *Emergency preparedness and response for petroleum & natural gas industry systems*

• The new Z246.2 helps organizations develop an emergency preparedness and response program to
  ✓ provide greater safety for workers
  ✓ establish best practices that are consistent across Canada
  ✓ help protect people, property and the environment
Coatings

- Published the first CSA standard on coatings for steel pipe in 1986, and currently develop and publish a series of standards on plant-applied external coatings for steel pipe (Z245.20)
- In 2014, published a new standard on field-applied coatings
- Z245.30 was developed in response to industry needs to address the quality of anti-corrosion coatings applied in the field during pipeline construction and operations

✓ Provides guidance to minimize integrity-loss for pipeline systems
✓ Includes requirements for coatings for girth welds, valves and flanges
✓ Covers the repair of damaged plant-applied coatings in the field
Liquefied Natural Gas (LNG)

• Z276, *Liquefied Natural Gas – Production, storage and handling*, applies to facilities for the liquefaction, storage, vaporization, transfer, handling and truck transport of LNG

• Includes requirements for small facilities, fixed fuelling stations and training of personnel

• Technical Committee includes experts from Canada, US and Europe

• New edition scheduled to published in January 2015 and will include requirements for mobile LNG fuelling stations and membrane tanks

New requirements after 2015:
✓ Risk Assessment for LNG facilities
✓ Large export terminals
✓ Small facilities
Pipeline Standards in Canada

• Canada operates some of the safest pipelines in the world because pipelines need to meet rigorous technical standards

• CSA standards are continually reviewed and updated to incorporate technological advancements and best practices

• Z662 contains 500+ pages of prescriptive and performance-based technical requirements

• Z662 takes a lifecycle approach; it covers the design, construction, operation and maintenance of pipelines, along with requirements for safety management systems
Join the Conversation!

https://community.csagroup.org
Thank You!

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