CSA Z741 – Bi-National Standard for Geological Storage of Carbon Dioxide

UIC Conference

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Project Manager
CSA Standards
Overview

- About CSA Standards
- Standards vs. Guidance vs. Regulations
- Role of standards in CCS
- CSA Standards’ Geological Storage of CO₂ standard
- Comparison to Class VI Regulation
CSA Standards

Accredited Standards Developer
• American National Standards Institute (ANSI)
• Standards Council of Canada (SCC)
• Active at ISO

Our Standards and Codes
• Over 3,000 standards and codes
• In 54 different technology areas
• Over 40% referenced in legislation
CCS Guidance

Solutions exist

- Best Practices
- Regulations
- Guidelines
- Papers

Knowledge continues to evolve
Regs? Standards? Guidelines? BPs?

Accredited Standards

- Balance of interests – meets needs of multiple interests
- Balanced matrix
- Accredited neutral 3rd party oversight
- Demonstrate compliance through mandatory language
- 60 Day Public Review
- Living document – revisions, amendments and mandatory reviews

All have a role and should work together
CSA Standards and CCS

Standard for Geological Storage of CO$_2$

- Bi-national USA / Canada
- Technical Committee controls content
- IPAC CO$_2$ providing support
Matrix Approach to Consensus

<table>
<thead>
<tr>
<th>User Interest Category</th>
<th>Min</th>
<th>Max</th>
<th>Actual</th>
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<tbody>
<tr>
<td>General Interest</td>
<td>8</td>
<td>11</td>
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<tr>
<td>Government and/or Regulatory Authority</td>
<td>5</td>
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<td>Owner/Operator/Producer</td>
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<td>Supplier/Contractor/Consultant Interest</td>
<td>6</td>
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Committee Organizations

Government/Regulators
- Ground Water Protection Council
- Alabama Dept. of Env Mgmt
- Mississippi Dept of Env Quality
- BC Oil and Gas Commission
- Energy Resources Conservation Board of Alberta (ERCB)
- Alberta Energy

Owner/Operator/Producer
- Southern Company
- ConocoPhillips
- Denbury Resources
- Chevron
- Husky Energy
- SaskPower

Supplier/Contractor/Consultant Interest
- DNV
- Schlumberger Carbon Services
- Advanced Resources International, Inc
- Global Technical Solutions and CCS
- Golder Associates
- Baker Hughes

General Interest/Expertise
- Princeton University
- Global CCS Institute (Australia)
- International Energy Agency (IEA, Paris)
- PEW Center on Global Climate Change
- Alberta Innovates-Technology Futures (AITF)
- World Resources Institute (WRI)
- University of Alberta
- International Institute for Sustainable Development (IISD)
Geological Sequestration of CO$_2$ Standard

- Establish requirements and recommendations for the geological storage of carbon dioxide

- Combine good practice already available

- Help bring credibility to market

- Comprehensive inclusion of CCS development and management, including; site screening, selection and characterization, development, operation, management, risk assessment and treatment, etc.
Storage Project Life Cycle

Confines, boundaries or limits of the Standard

Iterative Process
Start of injection
Cessation of injection

Entity | Site Screening Period | Site Characterization, Assessment, and Selection Period | Design and Development Period | Operational Period | Post-Injection Period
---|---|---|---|---|---
(Private) Operator
Regulator
Designated Authority

Closure Point: transfer of responsibility and liability

February 2, 2012
## Table of Contents

1. **Scope**
2. **Definitions**
3. **Management systems**
   - 3.1 Scope of activities
   - 3.3 Management commitment to principles
   - 3.4 Planning and decision making
   - 3.5 Resources
   - 3.6 Communications
   - 3.7 Documentation
4. **Site screening, selection, and characterization**
   - 4.1 General
   - 4.2 Site screening
   - 4.3 Site selection
   - 4.4 Site characterization and assessment
   - 4.5 Modelling for characterization
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5 Risk management
- 5.1 General
- 5.2 Objectives
- 5.3 Process
- 5.4 Context
- 5.5 Risk management plan
- 5.6 Risk assessment
- 5.7 Planning and review of risk treatment
- 5.8 Review and documentation
- 5.9 Risk communication and consultation

6 Well infrastructure development
- 6.1 Materials
- 6.2 Design
- 6.3 Construction
- 6.4 Corrosion control
- 6.5 Operation and maintenance

7 Monitoring and verification
- 7.1 Purpose
- 7.2 M&V program phases
- 7.3 M&V program objectives
- 7.4 M&V program design

8 Cessation of injection
- 8.1 General
- 8.2 Activities
- 8.3 Post-injection closure period plan
- 8.4 Post-injection and closure period qualification process
- 8.5 Decommissioning
- 8.6 Long-term (post-closure) stewardship
Expected Outcomes

• Benefit Industry
  – Bring credibility to industry
  – Supplement regulations, and amalgamate guidance

• Use/Reference in Regulation
  – Bridge gap between regulation
    • Class V & Class VI

• International Standardization
Summary

• CSA Standards is developing a comprehensive Bi-National CCS Standard

• Diverse group of experts developing content

• Help bridge the gap between regulations

• Build credibility in Geological Storage
Thank You

Questions?

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