International Organization for Standardization (ISO) Technical Committee 265 (TC-265): Carbon Dioxide Capture, Transportation, and Geological Storage

 Prepared for:  
 Carbon Storage R&D Project Review Meeting  
 Developing the Technologies and Infrastructure for CCS  

 Pittsburgh, PA

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Acknowledgement

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Issues Affecting CCUS

- Complying with EPA MRR Subpart RR & UU
- Categorization of CO₂ as a solid waste
- Possible characterization of CO₂ as a hazardous waste
- Potential conversion of State-based UIC Class II programs into UIC Class VI programs
- EPA’s Prevention of Significant Deterioration (PSD)
- EPA’s Best Available Control Technologies (BACT)
One mechanism to address these issues...

...International Standards
What are Standards?

- Consensus based
- Designed as a rule, guideline or definition
- Can be revised & updated
- Voluntary

- Standards must fit to purpose:
  - Prescriptive based
  - Objectives based
  - Performance based
  - Principles based
  - Hybrids
Must INCLUDE any and all...

- UNFCCC - IPCC
- ISO
- EU European Directives
- USDOE
- USEPA
- NGO’s (WRI, GCCSI, etc.)
- Federal, Provincial, State regulations
- Future expected directives
Why Standards?

- Because they are not laws…
  - *Standards & regulations can work together*

- Not Mandated

- Typically initiated by industry…
  - *And therefore better received and used by industry because they are part of the process*

- Harmonize across jurisdictions
Why Standards?

- Early access to information that could shape the market in the future
- Provides a voice for both industry and the public in the development of standards
- Streamline the regulatory process
- Demonstrate regulatory compliance
“Standards, smart local and global standards, are essential to the timely advancement of the technologies and equipment that will be necessary to make safe reliable power with the capture of emissions from hydrocarbon fueled power plants.”

Mike Monea, President Carbon Capture & Storage Initiatives Saskatchewan Power Corporation - Boundary Dam – email to CSA Group
ISO TC 265: Carbon Dioxide Capture, Transportation, and Geological Storage
ISO = A Global System

- Based in Geneva, Switzerland
- 163 Countries
- 97% of the World’s population
- >100,000 international experts
- >600 organizations in liaison
- >19,000 International Standards
ISO Standards Development

- WG experts consensus and
- 2/3 P-Members votes
- Less than 1/4 total negative votes

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- Less than 1/4 total negative votes

WG members (Consensus)

WD (Preparatory)

NP (Proposal)

CD (Committee)

DIS (Enquiry)

FDIS (Approval)

ISO / CS

ISO (Publication)

NP New Work Item Proposal
WD Working Draft
CD Committee Draft
DIS Draft International Standard
FDIS Final DIS
ISO ISO Standard
ISO TC 265 – CCS Organization

Twined Secretariat

Canada & China

Members

Countries

Liaisons

Participants

P-Member Nations

O-Member Nations

NGOs & Liaisons
ISO TC 265: P-Members

Participating Countries:

Australia
Canada
China
France
Germany
India
Italy
Japan
Korea

- Malaysia
- Netherlands
- Norway
- South Africa
- Spain
- Sweden
- Switzerland
- United Kingdom
- United States (ANSI)

- Voting Members
- Guaranteed International Expert Participation on all WGs
ISO TC 265: O-Members

Observing Countries:

- Argentina
- Brazil
- Czech Rep.
- Egypt
- Finland
- Iran
- New Zealand
- Serbia
- Sri Lanka

- Non-voting Members
- May request International Expert Participation on all WGs
- May upgrade to P-Member at any time
ISO TC 265: Liaisons

- ISO TC207 Environmental Management
- ISO TC67 Petroleum and Natural Gas
- CEN/TC 234 Gas Infrastructure
- IEAGHG
- CO2 GeoNet
- Carbon Sequestration Leadership Forum (CSLF)
- European Industrial Gases Association (EIGA)
- Global CCS Institute (GCCSI)
- International Energy Association (IEA)
- World Resources Institute (WRI)

- Non-voting Members
- Guaranteed International Expert Participation on all WGs
TC-265 Working Groups

- WG1 Capture
- WG2 Transportation
- WG3 Storage
- WG4 Q&V (MVA)
- WG5 Cross-Cutting
- WG6 CO2-EOR
WG1: Capture

Technical Report (TR):

- Pre-, post-, & oxyfuel combustion capture
- Industrial processes
- Separation, purification
- Dehydration, compression and pumping
- Liquefaction, installation, operation, maintenance
- Quality of CO₂ streams
- Monitoring, management systems
- Plant retrofitting

- 4 US Members
- All have lead author roles
WG2: Transportation

Pipeline transportation systems boundaries:

- Pipelines not currently covered by existing ISO/TC-67 standards
- Health, safety and environment (HSE) aspects specific to transport
- Monitoring of CO₂

Definition of CO₂ Transport Boundaries

- 2 US Members

Advanced Resources International, Inc.
WG3: Storage

Geological storage of carbon dioxide; Canada (Onshore) Japan (Offshore):

- Z-741-12 as seed document
- Site selection
- Site characterization
- Risk assessment & risk management
- Well construction
- Closure
- Post-closure

- 8 US Members
- Many have lead or co-lead author roles
WG4: Quantification & Verification

Quantification & Verification Methodology (TR); Led by China, with support from France:

- Project boundary & leakage
- CO$_2$ quantification
- Monitoring and reporting
- Third party verification
- Life Cycle Analysis

4 US Members
Definitions & Vocabulary; Led by France, with support from China:

- Terminology
- Definitions
- System Integration
- Public Participation & Engagement
- Mixing of gas streams from different sources
Carbon Dioxide Storage using EOR; led by USA, with support from Norway:

- Low-pressure subsurface oil field operating environments
- Reservoir & pore space management
- Manage known lateral stratigraphic traps in the target formation
- Coordination with WGs 1-5

- 18 US Members
  - 1 - Norway
  - 5 - Canada
  - 2 - China
  - 2 – Japan
  - 3 - UK
  - 2 - IEA
- 24 Total Members

Expected:
- France
- Liaisons
DOE-NETL RCSP = Membership
DOE-NETL Expertise Globally

Z-741-12 – Seed Document

- Jorg Aarnes, DNV
- Mike Blincow, Denbury
- Steve Carpenter, ARI
- Ian Duncan, UT-BEG
- Richard Esposito, SoCo
- Joe Kelly, ADEM
- Nino Ripepi, VT

- 3 of 8 Lead Authors
- 19% of total expertise on the Panel
DOE-NETL RCSP Expertise Globally

US TAG to TC-265 International WG Membership

- WG1: Capture
- WG2: Transportation
- WG3: Storage
- WG4: Q&V (MVA)
- WG5: Crosscutting
- WG6: CO2-EOR

>80% of total expertise on the US TAG
Next Steps... nexus in the USA

- 4 Plenary’s to date – Europe & Asia
- September 2014 – US TAG – Cleveland
- October 2014 – GHGT-12 – Austin, TX
  ISO TC-265 Panel discussion
- January 2015 – International WG & Full Plenary Meeting – Birmingham, AL
- 26 Countries will engaged with ISO TC-265 twice in the USA within 4 months

**GREAT OPPORTUNITIES TO SHOWCASE DOE-NETL RCSP EXPERIENCE & EXPERTISE**
TC-265 Plenary...nexus in the USA

- Technology Transfer opportunity
- Best Practices shared and included
- Quadrennial Review details included
- Bi-lateral CCUS relationships with China, Korea, & Norway
- ISO TC-265 may be the single most productive process to increase exposure, use, and inclusion -- especially in Non-OECD economies, who are more likely to be the “first adopters” of ISO TC-265 Standards – of DOE-NETL experience and expertise
Thank You

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