Development of International Standards for Mine Reclamation

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Topics for Today

- Background on ISO Standards
- History & Context of ISO Technical Committee for Mining (TC-82)
- Development of Reclamation Subcommittee (SC – 7)
- Reclamation Proposals and Status to Date
What are ISO Standards?

- Consensus based
- Designed as a rule, guideline or definition
- Revisable and updateable
- Voluntary
- Standards must fit to intended purpose:
  - Prescriptive based
  - Objectives based
  - Performance based
  - Principles based
  - Hybrids
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*
- Demonstrate regulatory compliance
- Streamline the regulatory process
- Harmonize across jurisdictions
- International fiduciary requirements for some sectors
Process Must INCLUDE any and all...

- MSHA
- OSHA
- EPA, OSM, DMME, etc.
- EU European Directives
- NGO’s (WRI, GCCSI, etc.)
- Federal, Provincial, State regulations
- Future expected directives
- Based in Geneva, Switzerland
- 163 Countries
- 97% of the World’s population
- >100,000 international experts
- >600 organizations in liaison
- >19,000 International Standards
- ANSI = US Member body (NYC)
- CSA Group manages TAG 82 for ANSI
ISO Standards Development

• ISO does not write standards

• ISO does not influence the technical content

• Technical Committees (TC) write standards

• P-Member countries approve standards

• Member countries have parallel Technical Advisory Groups (TAGs) that participate in national review and approval process (TAG 82 for USA)

• Nations adopt ISO standards (USA - one vote by ANSI)
History

• ISO/TC 82 Mining was founded in June 1955

• 2 plenary meetings in 1959 and 1962

• In the following years work has been carried out in the subcommittees

• Since the end of 1990s no activities, until
  • April 2013 in Germany,
  • December 2013 in South Africa,
  • September 2014 in Seoul, South Korea, and
  • September 2015 in Cleveland, Ohio
  • October 2016 in Helsinki, Finland
ISO TC-82: Mining

<table>
<thead>
<tr>
<th>Working Group</th>
<th>Description</th>
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<tbody>
<tr>
<td>WG1</td>
<td>Rock Drills</td>
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<tr>
<td>WG2</td>
<td>Continuous Surface Miners</td>
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<tr>
<td>WG3</td>
<td>Shearer loaders &amp; plough systems</td>
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<td>WG4</td>
<td>Structures for mine shafts</td>
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<td>WG5</td>
<td>Safety of underground mining machines</td>
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<td>Mine accidents</td>
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<td>WG7</td>
<td>Public reporting of reserves</td>
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<tr>
<td>SC7</td>
<td>Mine reclamation &amp; closure</td>
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As of Fall 2016, USA is also member of two WG’s for SC-7
ISO TC 82 – P-Members

<table>
<thead>
<tr>
<th>Australia</th>
<th>Korea</th>
<th>18 Participating Countries:</th>
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<tbody>
<tr>
<td>Canada</td>
<td>Mongolia</td>
<td>✓ Voting Members</td>
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<tr>
<td>Chile</td>
<td>Russia</td>
<td>✓ Guaranteed</td>
</tr>
<tr>
<td>China</td>
<td>South Africa</td>
<td>International Expert</td>
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<tr>
<td>Czech Republic</td>
<td>Spain</td>
<td>Participation on all</td>
</tr>
<tr>
<td>Finland</td>
<td>Sweden</td>
<td>WGs</td>
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<td>France</td>
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<td>Germany</td>
<td>USA</td>
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<td>Iran</td>
<td>Zambia</td>
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### ISO TC 82 – O-Members

<table>
<thead>
<tr>
<th>Country</th>
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<tbody>
<tr>
<td>Austria</td>
<td>Moldavía</td>
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<td>Bulgaria</td>
<td>Pakistan</td>
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<td>Croatia</td>
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<td>India</td>
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<td>Indonesia</td>
<td>Turquía</td>
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<tr>
<td>Japan</td>
<td>Ucrania</td>
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</tbody>
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#### 22 Observing Countries:
- ✓ Non-voting Members
- ✓ *May request* International Expert Participation on all WGs
- ✓ *May upgrade to P-Member at any time*
Member Affiliations of Current U.S. Technical Advisory Group (TAG - 82)
ISO Standards Development

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

- ISO (Publication)
  - 2/3 P-Members votes
  - Less than 1/4 total negative votes

- ISO / CS

NP (Proposal)
- WD (Preparatory)
- CD (Committee)
- DIS (Enquiry)
- FDIS (Approval)

WG members (Consensus)
History of Reclamation Standards?

- Introduced by South Korea at 2014 plenary; Surprised many in attendance in Seoul. South Korea remains lead, but current chair is now from France (C. Didiere).

- Working Group 1 (*Terminology*) approved in 2015 at Cleveland plenary. South Korea is lead with substantial input from Canada, France (new chair) and USA.

- Working Group 2 (*Mine Closure and Reclamation Management Planning*) approved in October 2016 at Helsinki plenary. Canada is lead, USA, France & Australia active participants. *Does not address health & safety.*
Status of Reclamation Standards?

- New work item proposals on abandoned mine land reclamation and water sampling were submitted by S. Korea and not approved to date. Revisions due in mid-2017. Both were viewed as prescribing existing technologies and not broadly applicable to international conditions.

- WG-1 has developed a third draft of the terminology base document

- WG-2 is currently developing a detailed outline
ISO Standards Development

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

ISO / CS

NP  New Work Item Proposal
WD  Working Draft
CD  Committee Draft
DIS Draft International Standard
FDIS Final DIS
ISO ISO Standard
Who is Participating and How?

- All TAG-82 members review and vote on all ballots for New Work Initiatives and/or confirmation of Working Group products.

- Each step requires Yes/No/Abstain votes from all TAG-82 members (with or without comment).

- For USA, W. Lee Daniels (VT), Tarunjit Butalia (OSU), and Steve Carpenter (UWY) have been primary reviewers/voters to date.
Additional USA Reviewers – Thanks!!

- Greg Conrad – IMCC
- Joe Friedlander – North American Coal
- Pete Stahl – University of Wyoming
- Jeff Skousen – West Virginia University

We welcome additional reviewers, particularly from industry, as long as we can maintain a modest level of confidentiality on draft content.
Acknowledgments

• Julie Cairns and Brian Zupancic at CSA Cleveland have given us tremendous guidance and insight on how to manage and adapt to the ISO process and culture.

• All of our USA reviewers.

• Michael Karmis at Virginia Tech for recognizing the need for direct USA involvement in this and other TC-82 developments.