ISO National Mirror Committees Training with Lesotho, Malawi, & Zambia: ISO/TC-82 - Mining

SOUTHERN AFRICAN DEVELOPMENT COMMUNITY
TOWARDS A COMMON FUTURE

USAID TRADE HUB SOUTHERN AFRICA

Standards Alliance

Prepared for:

Southern African Development Community & Standards Alliance

Prepared By:
Steven M Carpenter, Chair - US TAG ISO TC-82

April 1, 2015 11:00AM – 12:30PM

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ANSI

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Acknowledgement & Thank You

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CSA STANDARDS

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TOWARDS A COMMON FUTURE

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Discussion Topics

1	How to enhance the National Mirror Committee to ISO/TC 82: Mining 101
2	Specific ISO/TC 82 Issues
3	Lesotho, Malawi, & Zambia Integration to ISO/TC 82
4	Why Participate?
5	Next Steps & Takeaways

ISO/TC 82 Mining

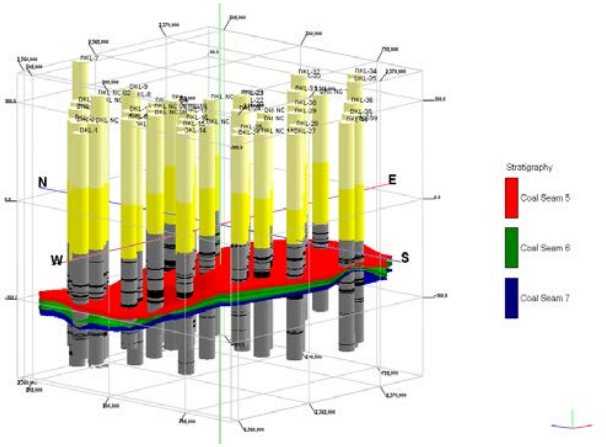
1: How to enhance the National Mirror Committee to ISO/TC 82: Mining 101

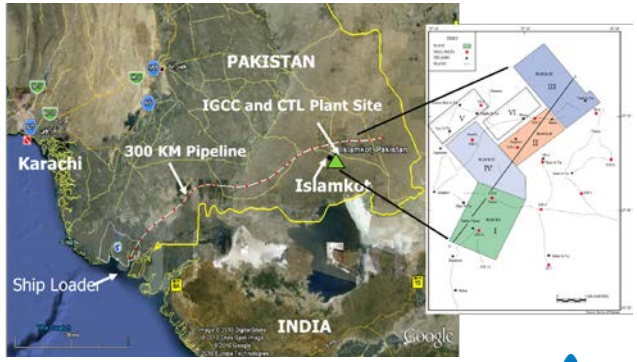
Mining 101

- What is where?
- How much is where?
- How do we get it out of there?
- How much does it cost to get it out?
- What do we do with it when its out?
- How much is it worth?

How Much of What is Where?

- Drill Holes
- Complete cross-section
- Determine amount via:
  - USGS Circular 891
  - SEC
  - Canada (NI 43-101)
  - Australia (JORC code)
  - South Africa (SAMREC code)





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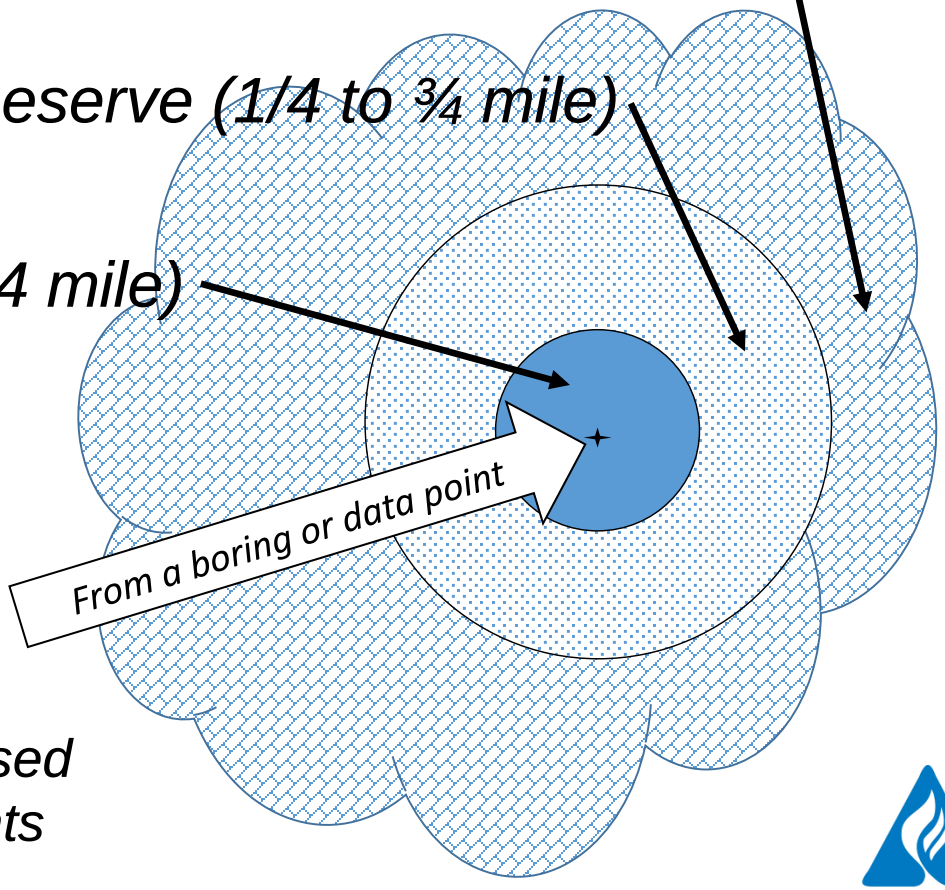
Reserve Classifications

- ***Inferred*** *(speculative) = Resource = (3/4 to 3 miles)*
- ***Indicated*** *(+/- 50%) = Reserve (1/4 to ¾ mile)*
- ***Measured*** *(+/- 20%) (1/4 mile)*



These 3 categories show relative reserve reliability based on distance from known points of measurement.

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Reserve Calculations: Recoverable Tons

Average Seam Thickness	x	Reserve Acres	x	Seam Density	=	Tons In-Place
6.50'	x	104.05	x	1863	=	1,259,993

Tons In-Place	x	Mine Recovery	x	Wash Recovery	=	Clean Recoverable Tons
1,259,993	x	60%	x	87.16%	=	658,926

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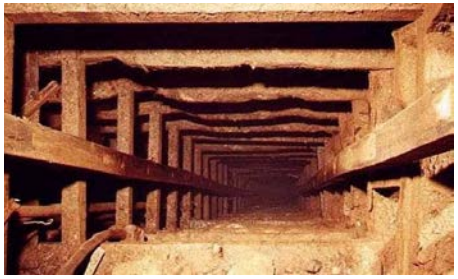
Types of Mining

- Drainage
  - Above drainage – surface mining
  - Below drainage – underground mining
- Surface Mining
  - Strip or Mountain top removal (Central App)
  - Open-Pit (PRB)
- Underground
  - Shaft
  - Drift
  - Slope
  - Bench



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Types of Mining - Surface

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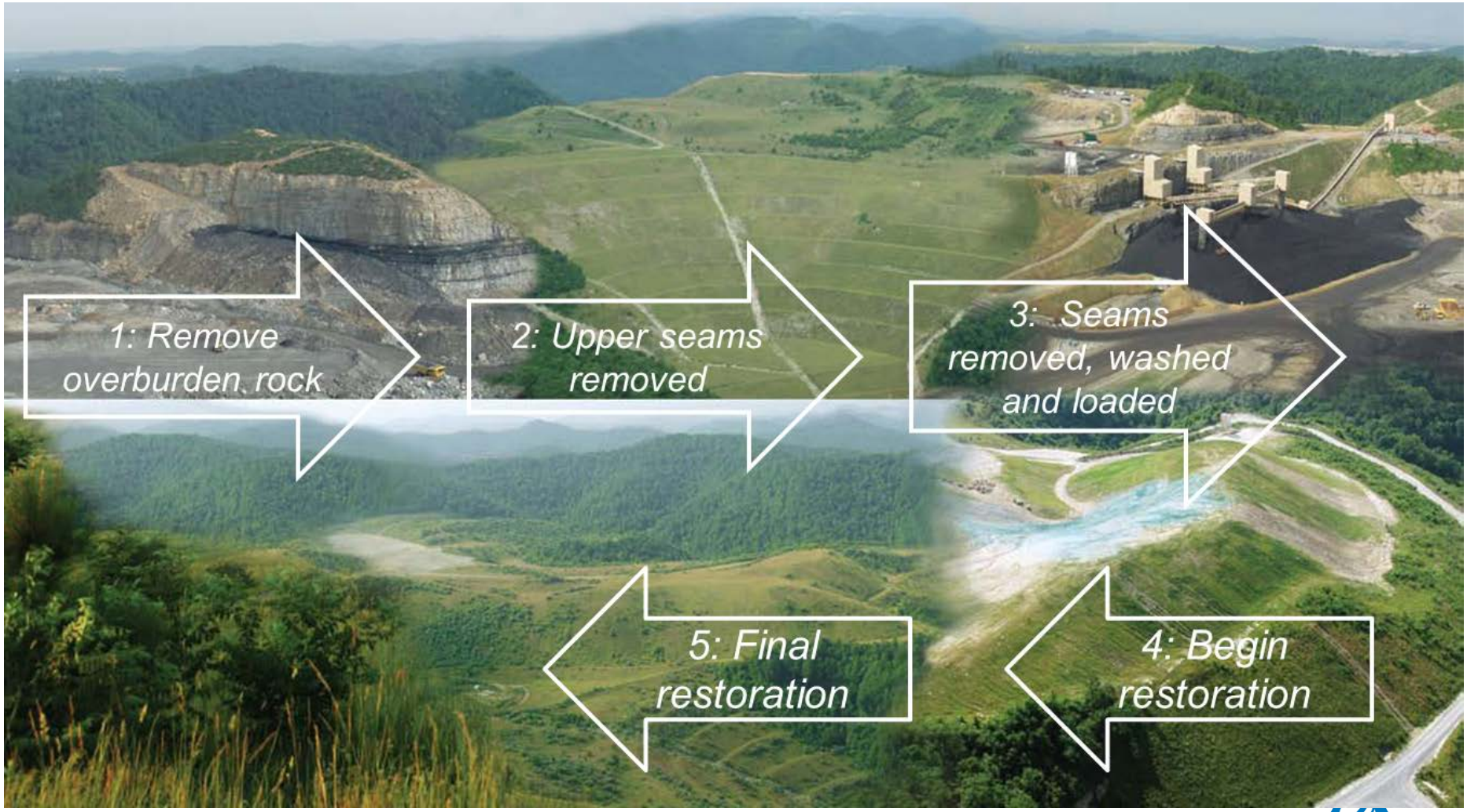
Types of Mining - Surface



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Types of Mining – Surface with Bench

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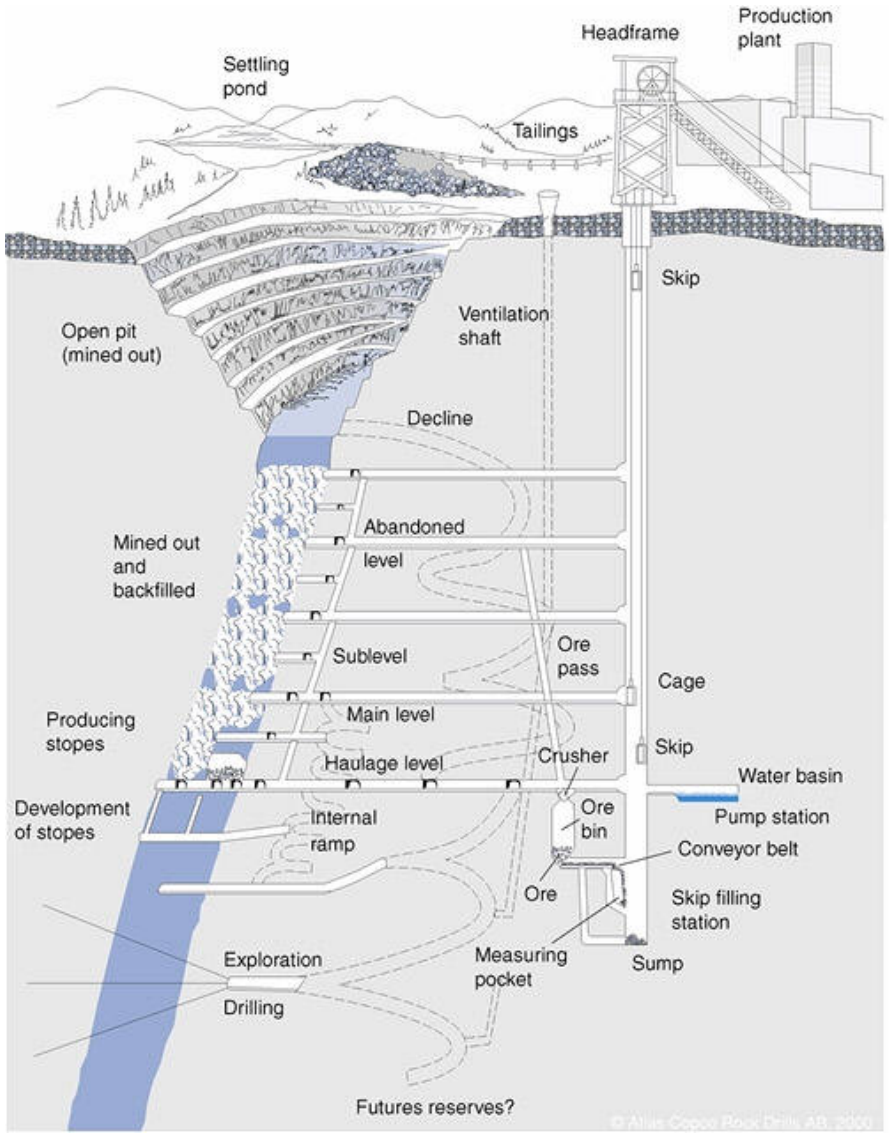
Types of Mining - Underground



Many operations include both surface and underground facilities at the same mine

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Types of Mining - Underground

Types of Mining - Underground

TC-82 encompasses…

- Equipment design
- Equipment manufacturing
- Equipment safety
- Engineering plans & drawings
- Estimation of mineral reserves
- Mine Reclamation
- Mine Structures

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ISO/TC 82 Mining

2: Specific ISO/TC 82 Issues

Scope

- Standardization of:
  - specifications relating to specialized ***mining machinery and equipment*** used in opencast mines (e.g. conveyors, high wall miners, rock drill rigs and continuous surface miners) and all underground mining machinery and equipment for the extraction of solid mineral substances, but excluding the preparation and processing of the minerals;
  - recommended practice in the presentation of ***plans and drawings*** used in mine surveying;
  - methods of ***calculation of mineral reserves***;
  - ***mine reclamation management***;
  - design of ***structures for mining*** industry.
- Excluded:
  - standardization of equipment and protective systems to be used in explosive atmospheres (dealt with by IEC/TC 31);
  - earth-moving machinery dealt with by ISO/TC 127.

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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, and
  - September 2014 in Seoul, South Korea

Motivation for Re-Activation

- Mining industry is increasing worldwide
- Mining companies & suppliers are engaged worldwide
- Great interest for international standards for the mining industry desired
- As being not active, standardization work on mining equipment has been carried outside ISO/TC 82, e.g. on mobile underground mining machines in ISO/TC 127 Earth-moving machines

Re-Activation

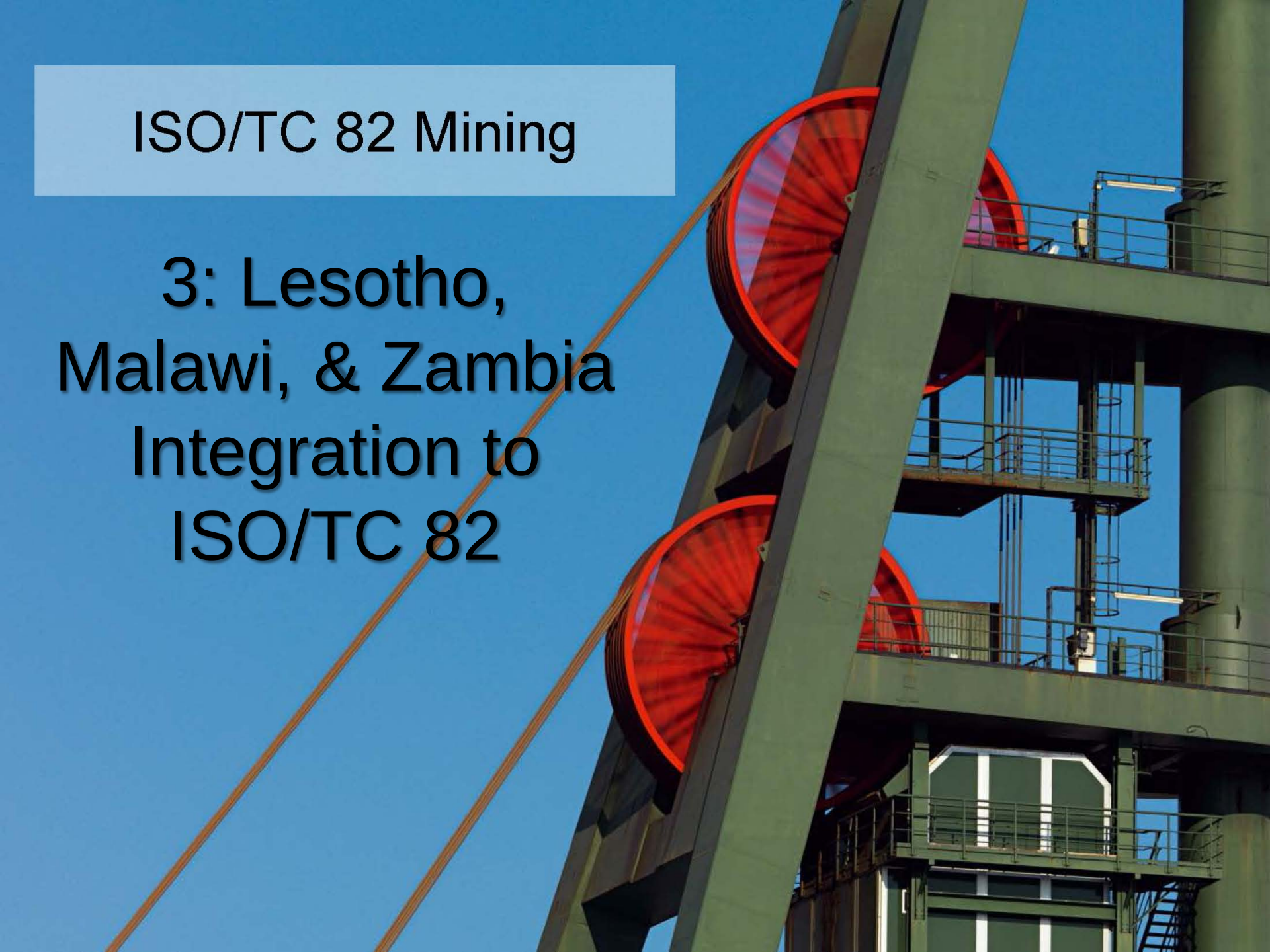
- Request for re-activation was submitted in October 2012 to ISO Central Secretariat
- ISO/TMB-Resolution 141/2012:
  - Re-activation of ISO/TC 82 The Technical Management Board,
  - Approves the re-activation of ISO/TC 82 "mining" and the allocation of the secretariat to DIN (Germany),
  - Appoints Mr. Reinhard Reinartz (Germany) as chairperson for the term 2013- 2018,
  - Requests that the ISO TC 82 review its scope in coordination with ISO/TC 127 and ISO/TC 195 to avoid overlaps and ensure transparency for experts and stakeholders.

TC-82 Status

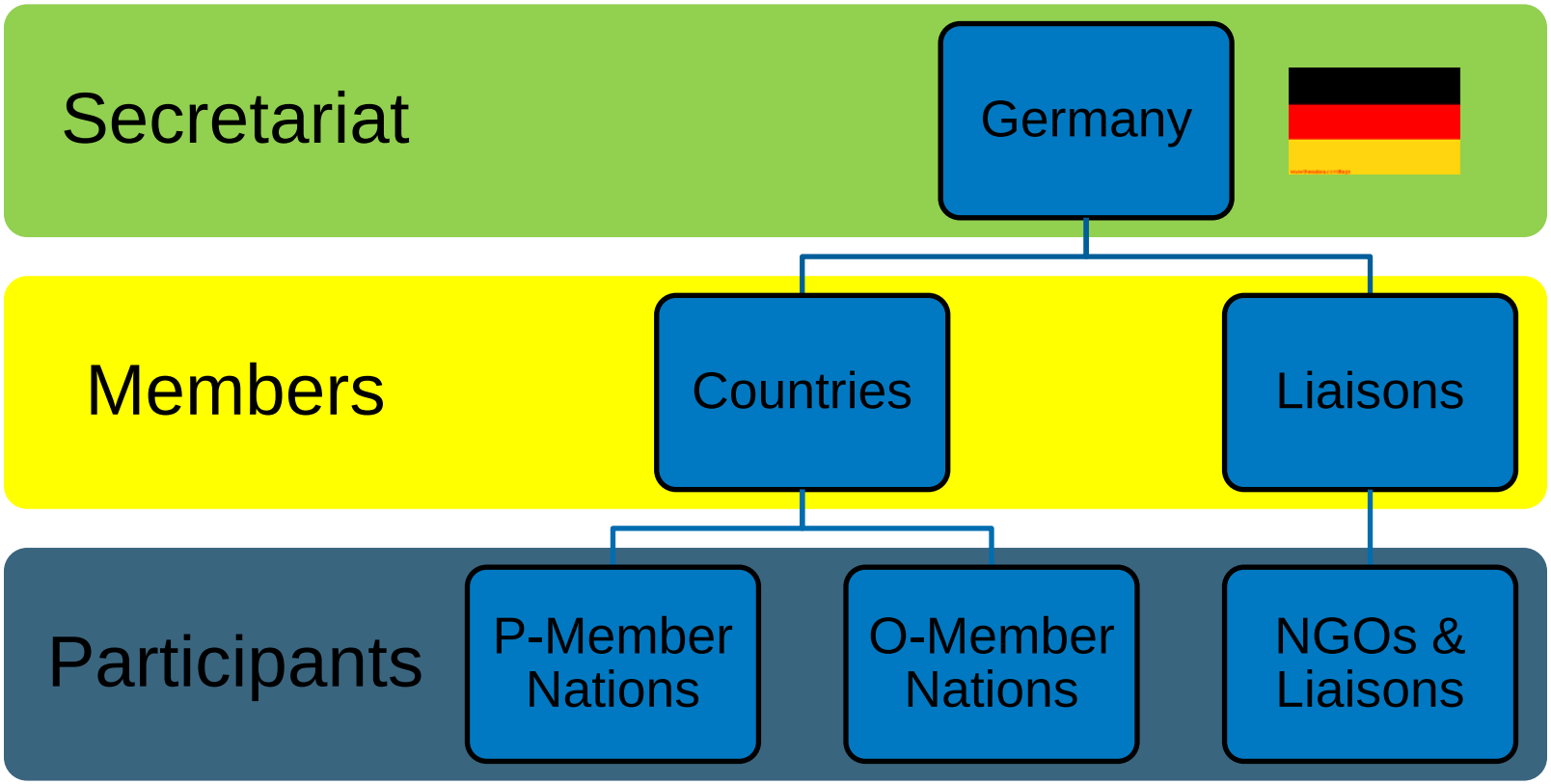
- Chairman: Reinhard Reinartz, Germany
- Secretariat: Hans Georg Blasgude, DIN, Germany
- Responsible for 36 International Standards
  - Graphical symbols for use on detailed maps, plans and geological cross sections
  - Chain conveyors
  - Wire ropes for mine hoisting
  - Rotary core diamond drilling equipment
  - Rock drilling equipment

ISO/TC 82 Mining

3: Lesotho, Malawi, & Zambia Integration to ISO/TC 82



ISO TC 82 – CCS Organization



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ISO TC 82 – P-Members

18 Participating Countries:

Australia	*Korea*
Canada	*Mongolia*
Chile	*Russia*
China	*South Africa*
Czech Republic	*Spain*
Finland	*Sweden*
France	*UK*
Germany	*USA*
Iran	***Zambia***

- ✓ *Voting Members*
- ✓ *Guaranteed International Expert Participation on all WGs*

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ISO TC 82 – O-Members

22 Observing Countries:

Austria	*Moldavia*
Bulgaria	*Pakistan*
Croatia	*Peru*
Cuba	*Poland*
Ecuador	*Romania*
Egypt	*Serbia*
Greece	*Tanzania*
Hong Kong	*Thailand*
India	*Tunisia*
Indonesia	*Turkey*
Japan	*Ukraine*

- ✓ *Non-voting Members*
- ✓ *May upgrade to P-Member at any time*

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ISO TC 82 – Liaisons

- *ISO/TC 127 Earth-moving machinery*
- *ISO/TC 195 Building construction machinery and equipment*
- *ISO/TC 211 Geographic information/Geomatics*
- *European Commission*
- *World Customs Organization*

- ✓ *Non-voting Members*
- ✓ *Guaranteed International Expert Participation on all WGs*

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US MC to ISO TC 82

World's leading manufactures of mining equipment

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US MC to ISO TC 82

Leading global mining consulting firms

Ausenco

MARSTON
A Golder Associates Company

Willis

Advanced Resources International, Inc.

ECSI LLC

US MC to ISO TC 82

World's leading academic, risk, and NGO's on mining

Advanced Resources International, Inc.

US MC to ISO TC 82

World's leading international firms and expertise

Ausenco

Advanced Resources International, Inc.

Willis

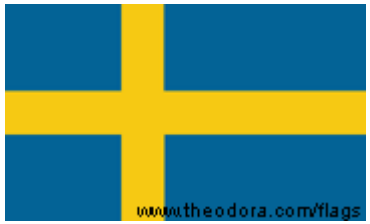
AFRICARY
African Carbon Energy

MARSTON
A Golder Associates Company

TharPak

TC-82 Working Groups

ISO/TC 82/JWG 1: Rock drill rigs



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Fletcher MINING EQUIPMENT

Vermeer

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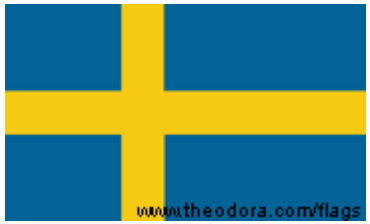
TC-82 Working Groups

ISO/TC 82/WG 2: Continuous surface miners



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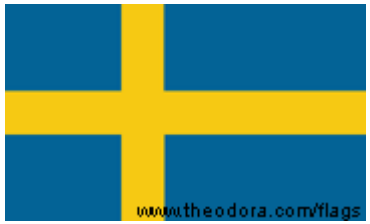
TC-82 Working Groups

ISO/TC 82/WG 3: Shearer loaders and plough systems



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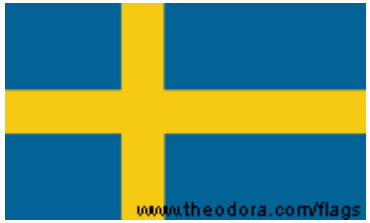
TC-82 Working Groups

ISO/TC 82/WG 4: Structures for mine shafts

- *No current US experts on this Working Group*



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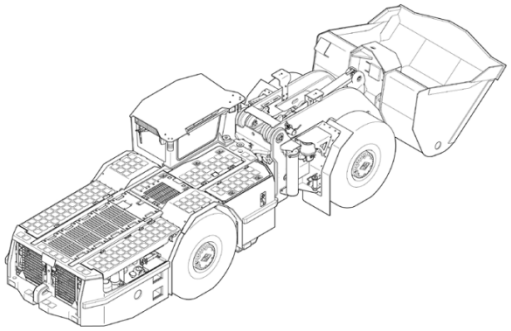
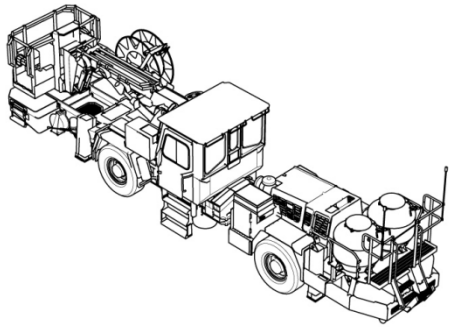
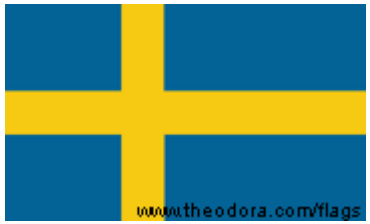
TC-82 Working Groups

ISO/TC 82/JWG 5: Safety of mining and earthmoving mobile machines working





United States Department of Labor
MSHA
Mine Safety and Health Administration



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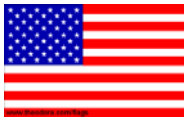

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TC-82 Working Groups

ISO/TC 82/WG 6: Classification of Mine Accidents

- *US has the preeminent expertise…*

- *…currently has no experts on the Working Group*

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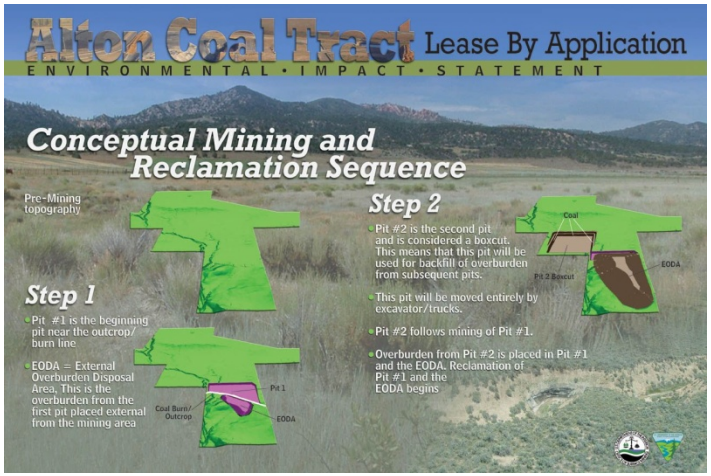
TC-82 Working Groups

ISO/TC 82/SC 7: Mine Reclamation Management

- Canada
- China
- France
- Germany
- Mongolia
- South Africa



ICCI Illinois Clean Coal Institute
Energy Research for a Cleaner Environment

ECSI LLC

VirginiaTech
Invent the Future

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TC-82 Working Groups

ISO/TC 82/JWG 7: Autonomous Machine Safety

United States Department of Labor MSHA Mine Safety and Health Administration

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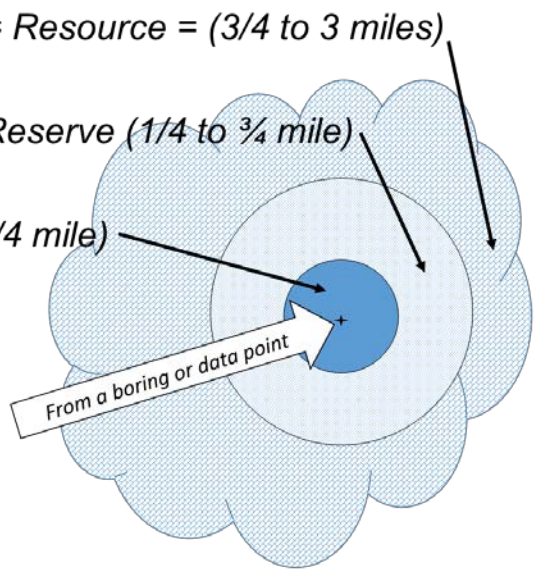
Future NWIP: Reserve Estimation

Methods of estimation of mineral reserves:

- US (**SEC Guide 7**)
- Canadian (**CN 43-101**)
- Australian (**JORC**)
- SME & CRIRSCO Template



SME
Society for Mining, Metallurgy & Exploration

crirsco COMMITTEE FOR MINERAL RESERVES INTERNATIONAL REPORTING STANDARDS

JORC

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Future NWIP: VAM/CMM & UCG

- Ventilation Air Methane
- Coal Mine Methane
- Underground Coal Gasification

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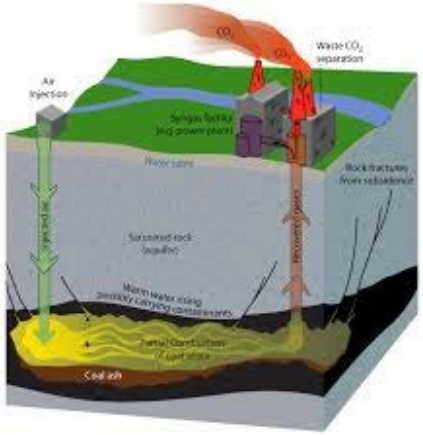

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ISO/TC 82 Mining

4: Why Participate?

Getting involved in ISO Standards provides significant benefits to industry and participating companies

Industry Benefits

- Early access to information that could shape the market in the future
- A voice for a company in the development of standards
- Helping to keep market access

Standards reduces the regulatory burden and harmonizes rules across jurisdictions

Helping Regulations

- Standards have a built in change process and can typically change faster than regulations
- Standards referenced in regulation can speed up the regulatory approval process
- Standards provide industry interests and other stakeholders a decision-making role
- Written by people more directly linked to actual operations

Cost Savings

- Reduce environmental and safety risks through broad based industry experience
- Improve public acceptance through trust in ISO brand and independent third party process
- Help advance operational processes, technologies, through external stamp of approval
- Leverage resources through shared effort to address common issues

Real-world application

Mike Monea
President, Carbon Capture & Storage Initiatives - Saskatchewan Power Corporation (Boundary Dam)

"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."

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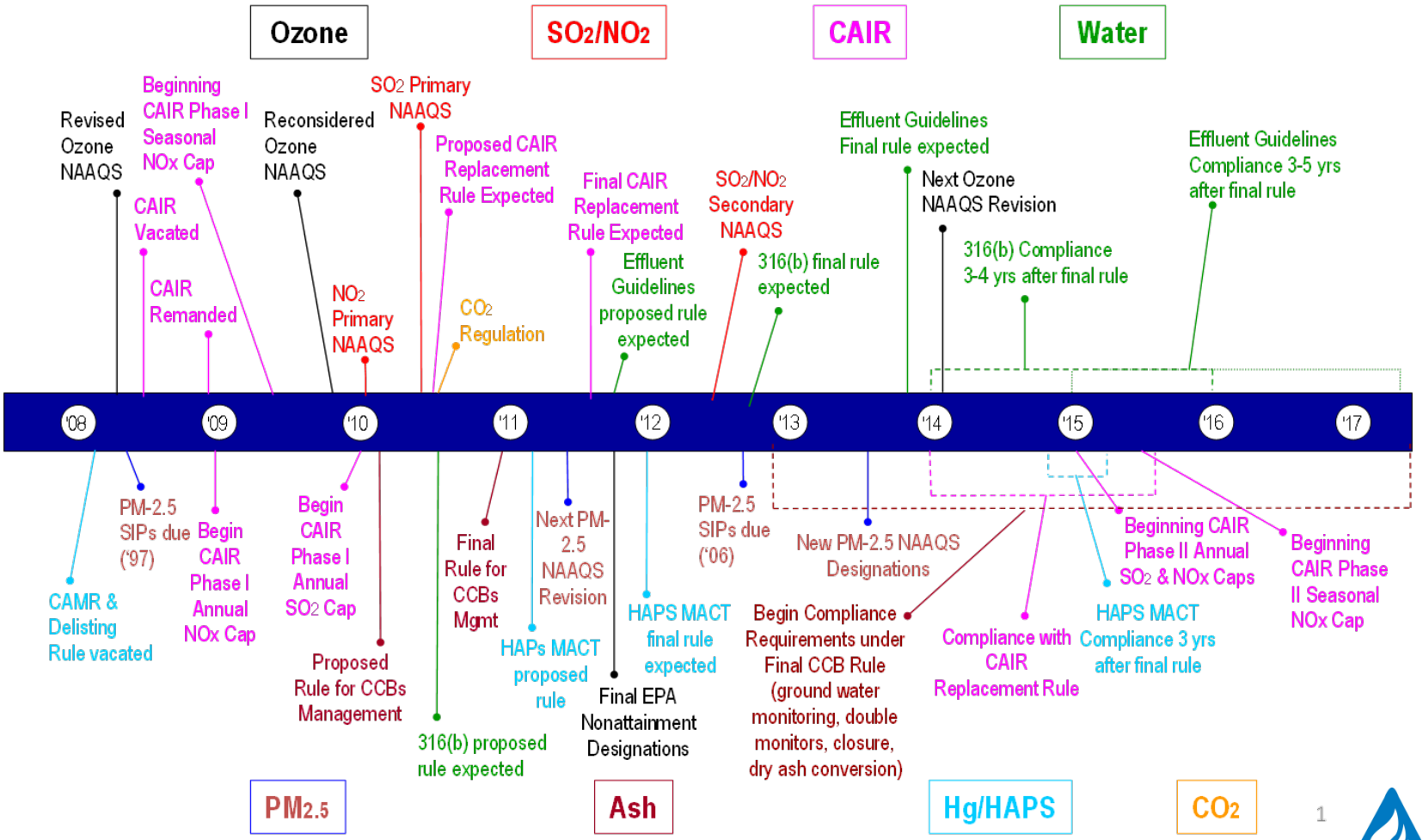
Regulatory Confusion



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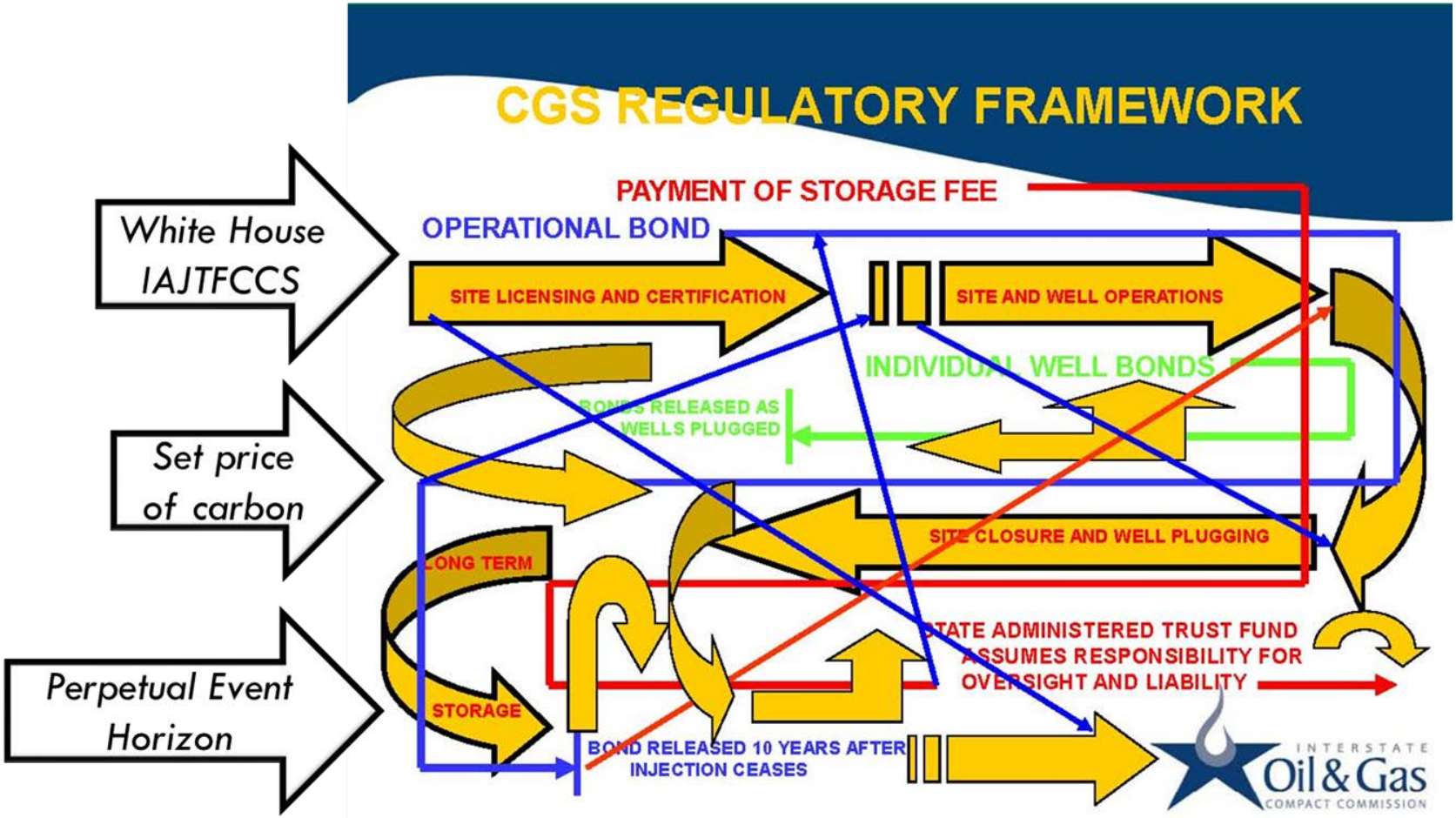
Regulatory Conflict



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Lack of …

OECD
BETTER POLICIES FOR BETTER LIVES

Kimberley Process

APEC
Asia-Pacific Economic Cooperation

United Nations Framework Convention on Climate Change

…Regulatory Framework:

- *Malaysia*
- *Argentina*
- *Iran*
- *Brazil*
- *Egypt*

…Industry Experience – expands membership:

- *Saudi Arabia*
- *Mexico*

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International Plenary Meeting - Birmingham

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Denbury

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International Plenary Meeting - Birmingham

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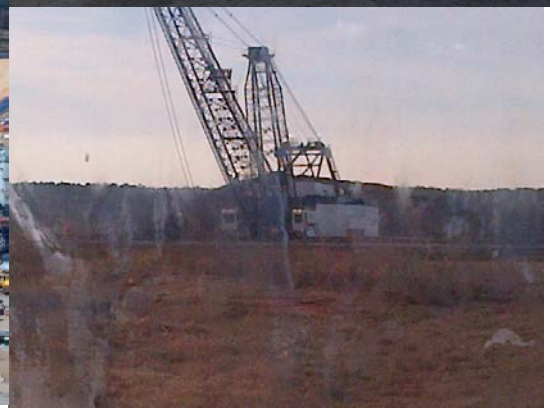

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Access to US MC to ISO TC 82

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ISO/TC 82 Mining

5: Next Steps & Takeaways

Monday's Introduction Comments

- Twinning opportunities
- Secretariat vs. Chair – how to run a MC
- Academics vs. Industry – stakeholder engagement
- Motivation and Morale
- Stakeholder engagement, Establish Linkages & Networks – we don't know how to do it!
- Best practices (BPM)
- Crosscutting issues
- TC Chair training

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…Monday's Introduction Comments

- Erratic Internet access & connectivity
- Consistency – change of job, ZABS foot the bill – aren't they sustaining anyway, can ZABS allow the "individual" to remain as member – top down driven…consider options
- Lesotho identified that the "demand" for standards work is low – educate benefits of other uses for participation – BPM, etc.
- Standards are voluntary (problem for many countries) but can be made mandatory

…Monday's Introduction Comments

- Appoint liaison between the SC, WG, JWG (ad hoc) – appoint as needed (or only if experts are available) to the TC
- NSB doesn't write the standard, the experts do! Are NSB writing standard?
- HoD report to ANSI

Minerals and Assets

- Stone aggregates
- Limestone
- Gemstones
- Uranium
- Coal (neighboring countries)
- Natural gas (neighboring countries)
- Copper

Current WG: What is Important?

- JWG 1: Rock Drills
- WG 2: Continuous Surface Miner
- WG 3: Shear Loaders and Ploughs
- WG 4: Mine Structures
- JWG 5: Equipment Safety
- WG 6: Mine Accidents
- JWG 7: Mine Reclamation
- SC 7: Autonomous Machine Safety

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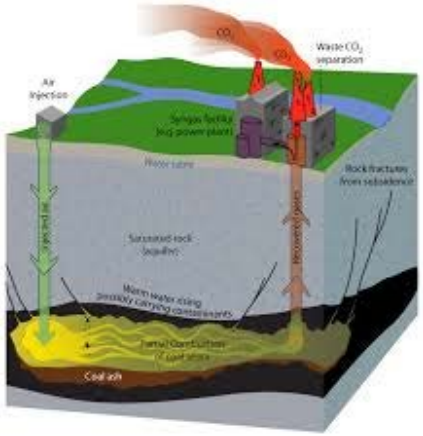
Future WG: What is Important?

- Methods of estimation of mineral reserves
- Ventilation Air Methane
- Coal Mine Methane
- Underground Coal Gasification



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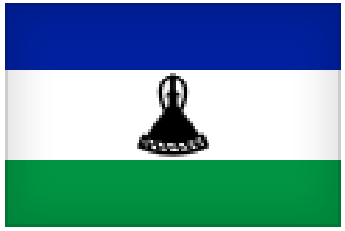
Key Takeaways

- Potential Twinning Opportunity – SA, USA
- Possible 2016 Plenary in southern Africa (Zambia)
- Participate in meetings
- Tie mining to GHG emissions & TC-242 & TC-265



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Advanced Resources' Experience in

SOUTHERN AFRICA REGION

Botswana, Mozambique, South Africa, Zimbabwe

Clients

AfPenn Exploration (ZM)
Anglo Coal (SA)
Botswana Geological Survey (BW)
EIB (ZM)
Gas Corporation of Botswana (BW)
IDC (SA)
INGWE (SA)
ISCOR (SA)
NATA Energy (BW)
Sasol (SA)
Shell (BW)
U.S. TDA (BW)
VALE (MZ)

Advanced Resources' Experience in

CHINA

Asian Development Bank
ARCO
Beijing Gas Transmission Co.
BG Group
BHP Billiton
BP
CDX Gas
CNPC
CUCBM
Far East Energy
Fortune Oil PLC
Landcome
Marathon Oil
Ministry of Coal Industry/Kailuan
Occidental Petroleum
PetroChina
Phillips Petroleum
Quest Resources
Shell
Shenyang Gas Company
Texaco
UN Development Program
US Department of Energy
US Environmental Protection Agency
US Trade Development Agency

Advanced Resources' Experience in

INDIA

Clients

Essar Oil

GAIL

MCN

ONGC

Reliance Gas Ltd

U.S. TDA

Advanced Resources' Experience in

Middle East

Jordan, Iraq, Pakistan, Turkey

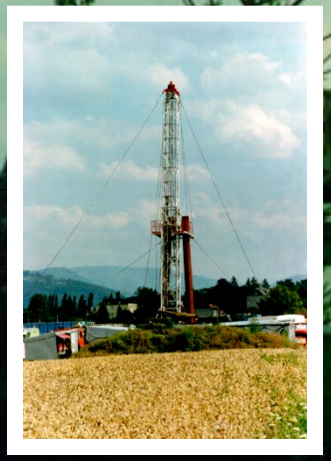
Clients

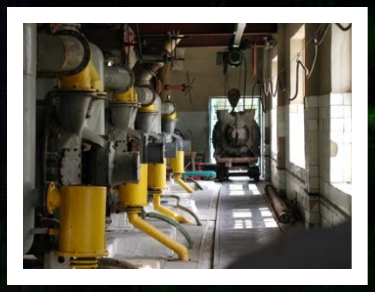
EPA - CMOP(Turkey)
Hema (Turkey)
TKI (Turkey)
TKK (Turkey)
Kingdom of Jordan
DGPC (Pakistan)
U.S. AID (Iraq & Pakistan)

Advanced Resources' Experience in

EASTERN EUROPE

Czech Republic, Kazakhstan, Poland, Russia, Ukraine





Clients

DPB (CZ)
ECOMETAN (UK)
GPO (CZ)
Industrial Union of Donbass (UK)
MMS Petroleum (UK) (PL)
PEER (UK)
TEMCO (KZ)
Texaco Poland (PL)
TKI (TU)
Ukraine Methane Partners (UK)
USAID/Burns and Roe (RU)
U.S DOE (PL)
U.S. TDA (UK)

Thank You

Washington, DC
4501 Fairfax Drive, Suite 910
Arlington, VA 22203
Phone: (703) 528-8420
Fax: (703) 528-0439

Houston, Texas
11931 Wickchester Lane
Suite 200
Houston, TX 77043-4574
Phone: (281) 558-6569
Fax: (281) 558-9202

Cincinnati, Ohio
1282 Secretariat Court
Batavia, OH 45103
Phone: (513) 460-0360
scarpenter@adv-res.com

Knoxville, Tennessee
1202 Kenesaw Ave
Knoxville, TN 37919-7736

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