

AngloGold Ashanti (Colorado) Corp.
 Anglo American Metallurgical Coal
 ArcelorMittal Mines Canada
 Barrick Gold Corporation
 BHP Billiton Diamonds Inc.
 BHP BMA Coal Australia
 Canadian Natural Resources Ltd.
 Cliffs Natural Resources
 De Beers Canada Inc.
 Foundation Coal West Inc.
 Freeport McMoRan Copper & Gold
 Goldcorp Canada Ltd.
 Imperial Oil Ltd.
 Iron Ore Co. of Canada
 Kinross Gold Corporation
 KMC Mining Corporation
 Ledcor CMI
 Mitsubishi Development Pty Ltd
 Newmont Mining Corporation



SMART Surface Mining Association
 For Research & Technology

www.smartmines.com

SMART Meeting Minutes

North American Construction
 NovaGold Resources Inc.
 Peabody Energy Corporation
 Prairie Mines & Royalty Ltd.
 Queens University
 Quadra FNX Mining Ltd
 Shell Canada Ltd.
 Sunco Energy
 Syncrude Canada Ltd.
 Teck Resources Limited
 Thiess Pty Ltd
 Total E&P Canada Ltd
 TransAlta Corporation
 University of Alberta
 University of Arizona
 University of British Columbia
 URS Corporation, Washington Div.
 Western Coal Corporation

Date: May 22, 2011 Location: ArcelorMittal Mines Canada Novotel Montréal Centre

Yves Desrosiers (ArcelorMittal) Gord Winkel (U of A) Paul Graham (Shell) Zoli Lukacs (NACG) Brad Wooley (Total E & P) Tom Demorest (Syncrude) Rockie Frizzle (Kearl) Steve Thornton (Kearl) Luke Zelmer (PMRL Highvale Mine) Laeeque Daneshmend (Queens) Tim Skinner, Rolf Timm (Total E & P) Craig Dirk (KMC Mining) Lyndon Chiasson (Teck Energy) Mike Di Marco (Teck Energy) Michelle Velez (Syncrude) Mark Bartlett (FMI) Tim Joseph (U of A) Chris Langmead (Suncor) Dave Purdy (Kearl) Peter Andrews (Goldcorp) David Corriveau (Shell) Scott Todd (Mitsubishi) Mark Sykes (Mitsubishi) Mark Richards (Teck Metals) Andrew Scott (Barrick) Martin Politick (Peck Tech)

Presenters: Tom Hynes (CMIC), Michel Plouffe (CMIC), Alex Henderson, Vale, (CMIC), Roger Marchand & Doug Tschetter (Bay 6 Solutions), Marc Bétournay (NRC), Sean Wilson (Ivara)

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Introductions and Agenda Review:

Gord Winkel welcomed the SMART member representatives and thanked ArcelorMittal Mines Canada for hosting our meeting.



SMART Agenda for
May 22, 2011 Montre

Action Log Review

All action items were incorporated into the agenda topics.

Shell - Canada Energy Company Profile (Paul Graham)

Paul provided a company overview of Shell Canada Energy. Information that Paul discussed is available at the following web site: http://www.shell.ca/home/content/can-en/aboutshell/our_business/business_in_canada/upstream/oil_sands/

SMART Strategic / Interface update (Gord Winkel)

Gord Winkel led our discussion on the interfaces of SMART, CMIC, EMESRT, Standards Data Connectivity, the CIM and the new Surface Mining Society. Gord's presentation is attached.



SMART Organization
May 2011.ppt

CIM - Surface Mining Society (Zoli Lukacs)

Zoli discussed the recently formed CIM Surface Mining Society. The Metal Mining Society, Coal and Industrial Minerals Society and Oil Sands Society will be amalgamated to create two new groups: the Underground Mining Society and the Surface Mining Society. The Metal Mining Society is set to become the Underground Mining Society and the new Surface Mining Society will be formed from members of the Oil Sands, the Coal and Industrial Minerals and the Metal Mining societies that have an interest in surface mining. Opportunities for synergy's, collaboration and efficiencies with SMART and the Surface Mining Society are possible.

Zoli noted the upcoming symposium "Safety and Reliability in the Mining and Resources Industries" on October 11 to 13, 2011 in Calgary. Our next SMART meeting will follow and is planned for October 14, 2011 in Calgary.

SMART Technology Committee update (Tim Skinner)

Tim provided an update, and discussed the path forward for the SMART Mining Industry Technology Standards for Mobile Mining. Tim proposed that a "Standards Function" with ties to the new CIM Surface Mining Society and SMART is formed. See Tim's presentation on slide 9 and 10. The Standards Function would have roles & responsibilities for Collaboration and Support, Stakeholder & Executive Communication, Technology Awareness, Operations Interface, and Administration. A 3 year program was proposed with a funding strategy that includes CMIC/grants, Society support, Industry Support, CIM Support etc. Tim's proposal was supported by SMART. SMART members agreed to request their firms to provide support funding of \$ 5000.00 per firm. Tim will prepare a Charter document that SMART members can use with their firms to gain support. Tim will arrange for Business entity strategy to accept funding. Tim's presentation is attached.



Technology
Standards CIM Orgar

Action: Tim Skinner

Canadian Mining Innovation Council (CMIC) and SMART Interface

Tom Hynes, Michel Plouffe and Alex Henderson, of CMIC provided an overview of CMIC

CMIC Mission

To enhance the competitiveness of a responsible Canadian mining industry through collaboration and alignment of resources in education, research, innovation, and commercialization.

Vision

Canada is the global leader in a socially and environmentally responsible, safe and productive mining industry through leading-edge research and innovation.

5 Strategic Goals

CMIC builds its business plan around five strategic goals laid out in the Pan-Canadian Research and Innovation Strategy. They are to:

1. Drive breakthrough research solutions to address critical needs in targeted areas
2. Enhance sustainable research performance and receptor capacity through HQP
3. Optimize research efficiency and achieve innovation potential through collaboration
4. Create a mining research and innovation culture effectively linking research capability to industry needs
5. Enroll new audiences and key decision-makers to support mining research and innovation

Synergy with SMART and CMIC in the areas of identifying the key initiatives for R&D work was discussed. SMART can provide ideas and direction for targeted research for CMIC consideration to take the lead on in advancement. At the next SMART meeting, we will use some time to discuss further.

Action Item: SMART Members

2012 SMART Learning Seminar (Tim Joseph)

Current plans are to have our next seminar in 2012, before the Annual CIM in Edmonton. The Learning Seminar would be on Saturday May 5th, our SMART meeting on Sunday May 6th, and the Annual CIM is May 7th to 10th, 2012. Please contact Tim to offer any ideas, help and suggestions for speakers that you would like to have at the seminar.

The following is a list of previous seminars:

15. 2012 -
14. 2010 - safe healthy mining Innovations: people & practice
13. 2009 - "better strategies with fewer resources ... "
12. 2008 - "Learning from the best" in operations and systems integration
11. 2006 - '06 Equipment Evolutions
10. 2005 - Managing Risk in a Changing Mining Environment
9. 2003 - Maintenance, Operations and \$\$
8. 2002 - Solutions for Better Health, Safety and Environment
7. 2001 - Large Heavy Haulers 'Is Bigger Better"
6. 2000 - Information Needs of the Mining Industry
5. 2000 - Computer Mine Planning Workshop
4. 1998 - Large Haulage Truck Transportation
3. 1997 - Mine Maintenance
2. 1996 - Wireless Communication and Data Handling
1. 1995 - Global Positioning Systems in Mining

Action: Tim Joseph

Truck Shovel User Group Update (Steve Thornton)

The most recent TSUG meeting was held on May 4th and 5th, 2011 in Fort McMurray hosted by Syncrude Aurora Mine. The next meeting is being planned for November 2011.



C TSUG Information
for Web Site.ppt

Bay6 Mag Filter for Oil & Hydraulic Systems (Roger Marchand, Doug Tschetter Bay 6 Solutions)

Roger & Doug provided a presentation on Bay 6 Mag Filter and he has previously e-mailed his presentation to SMART members. Bay6 Solutions specializes in mitigating failures of fluid systems where ferrous contamination is an issue in mobile or stationary equipment. Custom designed MAG-SHIELDS™ capture and contain ferrous contamination in hydraulic, lubrication, fuel and other fluid systems. Components are modular, shapeable and scalable allowing adaptation to many applications and irregular confinements. www.bay6solutions.ca

EMERST Update, Oilsands & SMART involvement (Gord Winkel)

Gord Winkel provided a brief update on EMERST. Syncrude has joined as a Tier 1 member and Suncor is also a Tier 1 member. For additional information on EMERST, SMART members can contact John Thomas directly at 780-790- 5902, email thomas.john@syncrude.com for further information.

IVARA Asset Performance and Reliability (Sean Wilson)

Ivara presented a brief overview of how a partnership between industry and mining technology vendors can eliminate some of the issues currently faced by the industry. The following is a synopsis of the presentation provided by Sean.

Addressing the Equipment Data Dilemma: Technology Alignment, Integration and Cloud Computing requirements in the Mining Industry.

As the variety and amount of technology deployed in mining operations increases so does the challenge in insuring that maximum value is derived from these independent sources of data. The demand to strategically implement the right solutions across an organization has become vital to success, sustainability and profitability. These solutions need to address production, operations and safety. Many organizations are confused about each vendor and their technology core competence and currently there is no one integrated technology roadmap that can provide all of the business and technical requirements a mine operation has when trying to address infrastructure, production and maintenance needs.

Based on our observations and engagements with clients and prospects over the last decade and in particular the last several years, Ivara has recognized a growing need to bring vendors together to solve the challenges faced by our industry. The mining industry has begun the process of integrating both the production and maintenance areas when it comes to decision support and understanding how it impacts profitability. Areas of challenge are:

1. Infrastructure
2. Data integration
3. Collection, management, and deployment of relevant content

Large Tire User Group Update (Tom Demorest)

The most recent LTUG meeting was May 16th and 17th, 2011 in Gillette, Wyoming hosted by Alpha Coal West & Peabody Energy.

Troy Meier is the elected chair of LTUG and Bob Tupper provides liaison to the SMART group

Items being worked include:

- Standardized training specs or practices to share best practices and training. (Oil Sands Safety Association may need to be involved with this)
- Scrap tires and disposal, manufactures participation to help remedy this problem. Possible upfront fee to research and develop disposal methods
- Heavy hauler wheel tracking and benchmarking programs.

Next meeting planning is as follows: Week of October 17th in Bloomington.

Monday October 17th Bridgestone Bloomington Plant tour (25 max) optional travel day for those that choose not to attend the tour.

Tuesday October 18th Site Presentations and discussion

Wednesday October 19th Manufacturer's presentation day invitations pending (Michelin, Bridgestone, Titan, Goodyear and Yokohama)

Thursday October 20th Possible tours to consider; Peabody site visit, Caterpillar plant tour, Komatsu plant tour

HMII Hydrogen Mine Introduction Initiative (Marc Bétournay NRC)

The Hydrogen Mine Introduction Initiative (HMII) has been set up to "pave the way" for the potential usage of hydrogen for underground mining operations, with a special emphasis on underground mine vehicles. Several HMII Participants are interested in broadening the companies involved, with obvious benefits to financial support, but also to ensure that the awareness of hydrogen's real potential and challenges are better known throughout the industry. Surface mining has been suggested as a potential area of interest - possibly more for forklifts in warehouses, crew vehicles, tunnel/ conduit inspections and other niche applications for now, rather than for the huge surface trucks.

Marc's presentation reviewed current issues and opportunities for underground applications as wells as Surface Mining Hydrogen power application considerations. If you would like a copy of Marc's presentation, please request from Tom Demorest.

Testing and Implementation of a Fatigue Monitor System for Haul Truck Operators (Mark Bartlett)

Real-time monitoring and control of fatigue events is being implemented at Freeport McMoRan open pit mines utilizing the Seeing Machines DSS technology. Evaluation and testing of the technology showed that it works for most operators, most of the time though it is not a silver bullet to the fatigue problem. Additionally, the system is reactive, meaning it only measures events as they are happening, rather than predicting fatigue levels. Open pit truck drivers working a typical 12-hour shift have a fatigue profile that follows a typical circadian cycle, with a peak in fatigue events between the hours of 4 to 6 am in the morning. Timely interventions by dispatchers and supervisors can significantly reduce the total number of micro-sleep events thereby reducing the probability of berm strikes, vehicle collisions, and catastrophic incidents associated with haul trucks. Operator acceptance to the technology is directly related to the amount of information they are provided about how it works, and their perception of how the information will be used by mine management. Marks presentation is attached here.



Mark Bartlett Fatigue
2011Pres.pdf

Items for Information Sharing - (SMART Members)

Information Sharing continues to be a successful item. Many topics have been shared. Attached is a list of all items covered with the Information Sharing topic. New topics can be initiated at any time. Contact Tom Demorest with your topic idea for sharing.

1. Equipment Top 10 downtime Reasons (Shovels, Trucks, Dozers, Loaders)	2002
2. Communication and Safety Meetings (On site / Off site, agenda, frequency)	2002
3. Mining Organization Structure	2003
4. Shift Change and Coffee Breaks	2007
5. Equipment Replacement Strategy (Truck and Shovel Life)	2004
6. Support Equipment Requirements	2004
7. Top Safety Items	2005
8. Engine Life Tier 1	2005
9. Key Research Items	2007
10. Heavy Hauler Fueling	2006
11. Shovel PM Strategy	2006
12. Lockout Procedures	2007
13. Fatigue Management	2007
14. Collision Avoidance	2008
15. Diesel Additive	2008
16. Lightening	2008
17. Fire Suppression	2008
18. Washbays	2008
19. Shovel De-Decking	2008
20. Mine Equipment Re-Fueling (updated)	2009
21. Update to Equipment Replacement Strategy (item 5)	2009
22. Integrating New Equipment (Technology Committee)	2010
23. GIS Geographical Information Systems	2010
24. Tire Pressure Monitoring	2011
25. Maintenance Process & Efficiencies (Consultant used)	2011

Future topics suggested for information sharing include:

Drill Chip Sampling
Collision Avoidance
Wireless Communications

SMART Technical Session at the Annual CIM in Montreal in 2011 (Chris Langmead - Suncor)

Chris Langmead is the chair of our SMART Session at this years annual CIM.

SMART Innovation & Technology Session (Tuesday May 24, 2011 2 pm to 5 pm)

This session profiles the work of the Surface Mining Association for Research and Technology [SMART] in support of Mining Industry effectiveness and sustainability. The SMART organization [with some 34 mining firms and four universities participating] focuses on leading edge initiatives that promote safety and efficiency, provide learning, forums, share techniques for improving operations/maintenance effectiveness, benchmark performance, and support innovation and collaborative research in Mining. The SMART session will be engaging for Mining operators and equipment manufacturers alike as we present and dialogue on topics of significance to Mining safety, equipment optimization, technology development, research and innovation.

Safety Items/Round Table

Craig Dirk inquired if any members have completed work on “Fitness for Duty” protocol. If members have any information to forward they can provide the information to Craig Dirk at KMC Mining, Phone: 780-454-0664, Direct: 780-732-9940, Cell: 780-235-6958, email: craig.dirk@kmcmining.com

Next SMART Meeting

Friday October 14, 2011 in Calgary, hosted by IOL (Kearl) just after the symposium “Safety and Reliability in the Mining and Resources Industries. Contact is Steve Thornton and Rockie Frizzle.

ACTION LOG - May 22, 2011

DATE OF ACTION		NAME	DESCRIPTION	DATE REQ'D
Nov. 5, 2009	Action Item	Steve Thornton Tom Demorest	Post photos of specialized stands, work platforms, temporary and/or permanent handrail systems on SMART web site.	On-Going
Nov. 18, 2010	Action Item	Steve Thornton	Include Lubrication as a topic at a future TSUG meeting.	OPEN
Nov. 18, 2010	Agenda Item	Tim Joseph	Next Learning Seminar planned for 2012	Oct 14, 2011
May 22, 2011	Agenda Item	Tim Skinner	SMART Mining Industry Technology Standards for Mobile Mining. Charter Document for firms to use to get funding and strategy for receiving funds.	OPEN
May 2010	Agenda Item	Gene Tucker	Quadra Mining Company overview	OPEN
May 22, 2011	Agenda Item	Gord Winkel SMART Members	SMART to provide ideas and direction for targeted research for CMIC consideration to take the lead on in advancement.	Oct 14, 2011
May 22, 2011	Agenda Item	Chris Langmead	SMART Session at the Annual CIM in Edmonton in 2012	Oct 14, 2011