The M-Tex Mining Collaborative Network
by Ashley Van Krieken MAusIMM, Principal Consultant, Tatxan Pty Ltd

Issues of safety are well known and discussed in the industry however often solutions to those identified are based on existing known technologies and products. The potential for new products, whether they are adapted from other industry sectors or the result of new R&D, is commonly not considered. Equally, some safety items are just accepted as they are.

Such is the case with worker personal protective equipment (PPE). A lot of people think a work shirt is a work shirt, gloves are gloves and socks are socks but this is not necessarily the case. But what if your work shirt could regulate temperature to keep you comfortable, provide chemical or gas detection, have in built sensors and monitors or mould to your body shape.

This is the potential offered by smart textiles and garments and is part of a new project being supported by the Victorian and Commonwealth Government – the TCF Mining Collaborative Network (M-Tex).

M-Tex is a project of The Council of Textile and Fashion Industries of Australian (TFIA), a national not for profit organisation (based in Melbourne) representing businesses and individuals in the Textile, Clothing and Footwear (TCF) industry. First established in the 1940s, TFIA (and its affiliates) has approximately 1800 members representing 22 000 workers in Victoria. The project is being funded under the Victorian Government’s Collaborative Network Pilot Program (CNPP).

M-Tex will bring together proven innovative textiles, clothing and footwear (TCF) firms with research organisations and match them with mining and resources industry practitioners to help develop and implement innovative, high value TCF solutions for technical and OHS problems being confronted by the Australian industry. The project has identified numerous activities to engage with mining industry professionals ranging from challenge workshops, through to seminars, workshops and booths at various conferences. More information will be provided to AusIMM members as it becomes available. The network will also seek input from the sector through The AusIMM Health and Safety Committee in addition to utilising the AusIMM branch network.

The principle behind the network lies in developing ongoing relationships with senior mining industry practitioners to identify – and alert – Network members (textile and clothing suppliers and researchers) to existing or emerging problems they confront in their everyday operations, whether they require technical textile solutions (eg blast protective curtains/shelters, enhanced filtration systems) or addressing OHS issues (requiring a combination of protection, high performance and comfort in the TCF products used). Relevant Network members will then undertake collaborative R&D projects to develop – and ultimately manufacture and supply TCF products that address the identified problems.

The project will be guided by an Industry Reference Group which will comprise representatives from all stakeholder groups. In the case of The AusIMM, this will be through Angus M Robinson, Chair of the AusIMM Health and Safety Committee. Angus is well placed in this role, having held previous executive roles in Australia’s hi-tech manufacturing sector and is currently an industry development adviser to the Advanced Manufacturing CRC Ltd. In addition to Angus, liaison between the network and mining sector will be assisted through the involvement of Ashley Van Krieken MAusIMM, former Director of Member and Branch Services for The AusIMM in the role of network liaison.

The project has received strong support from The AusIMM Health and Safety Committee given its focus on finding solutions to problems arising in the mining industry. Some of these solutions may already exist – for instance much of the technology devoted to defence and emergency service protection may be readily transferable to the mining sector – while others may require additional research and cooperation between TCF companies, researchers and mining companies.

While a big focus will be on PPE issues and improvements/ refinements to existing equipment, the potential role of technical textiles for blast protection, overhead protection, structural support and waste management among others also opens up numerous potential and more cost effective approaches to mining activities and processes.

More than 15 companies are already part of the network with many more joining as the network moves into its operational phase.

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Members interested in contributing to the project are asked to contact Ashley Van Krieken, Network Liaison via email tatxan@bigpond.com or The AusIMM Health and Safety Secretariat dedwards@ausimm.com.au.

More information on the network is available from the website www.m-tex.org.
The Royal Commission made sixteen recommendations as follows:

1. To improve New Zealand’s poor record in health and safety, a new Crown agent focusing solely on health and safety should be established.
2. An effective regulatory framework for underground coal mining should be established urgently.
3. Regulators need to collaborate to ensure that health and safety is considered as early as possible and before permits are issued.
4. The Crown minerals regime should be changed to ensure that health and safety is an integral part of permit allocation and monitoring.
5. The statutory responsibilities of directors for health and safety in the workplace should be reviewed to better reflect their governance responsibilities.
6. The health and safety regulator should issue an approved code of practice to guide directors on how good governance practices can be used to manage health and safety risks.
7. Directors should rigorously review and monitor their organisation’s compliance with health and safety law and best practice.
8. Managers in underground coal mines should be appropriately trained in health and safety.
9. The health and safety regulator should issue an approved code of practice to guide managers on health and safety risks, drawing on both their legal responsibilities and best practice. In the meantime, managers should consult the best practice guidance available.
10. Current regulations imposing general health and safety duties on the statutory mine manager should be extended to include detailed responsibilities for overseeing critical features of the company’s health and safety management systems.
11. Worker participation in health and safety in underground coal mines should be improved through legislative and administrative changes.
12. The regulator should supervise the granting of mining qualifications to mining managers and workers.
14. The implementation of the coordinated incident management system (CIMS) in underground coal mine emergencies should be reviewed urgently.
15. The activities of the New Zealand Mines Rescue Service need to be supported by legislation.
16. To support effective emergency management, operators of underground coal mines should be required to have modern equipment and facilities.

These recommendations focus on reform in a number of areas, including increased clarity about regulatory requirements, improved oversight and approvals by regulators, health and safety training, improving workplace cultures, and emergency response capability and co-ordination.

The report notes: ‘The changes recommended by the commission rest firmly on the principle that health and safety in New Zealand can be improved only by the combined efforts of government, employers and workers.’

The New Zealand Government’s response to the Royal Commission

The Royal Commission’s report was finalised and presented to New Zealand’s Governor General and Government for consideration on 30 October 2012. The government publicly released the Royal Commission report on 5 November 2012.
following a private briefing for the families of the deceased.

In releasing the Royal Commission report, the Prime Minister welcomed the report and its recommendations. The Prime Minister’s press release stated:

‘The Government will be broadly accepting those recommendations and will be working to implement them as quickly as possible.

‘A small number require further investigation before they can be put in place; for example, the recommendation of the establishment of a new Crown entity focused on health and safety.’

As part of the government response, the Minister for Labour (including responsibility for Health and Safety regulation) Hon Kate Wilkinson resigned from that role (retaining other ministerial responsibilities). The Prime Minister has appointed the Hon Christopher Finlayson as Acting Minister of Labour.

The future of the Pike River Coal Mine

Solid Energy is now the owner of the Pike River Coal Mine. Solid Energy is exploring whether the mine can be developed in a commercially viable manner. Solid Energy has entered into an agreement (a ‘Body Recovery Deed’) about the circumstances and manner in which the recovery of the deceased miners’ bodies may be recovered in the future.

AusIMM actions

Following the release of the Royal Commission report, Tony King, chairperson of The AusIMM New Zealand Branch issued a statement on behalf of The AusIMM welcoming the report’s release.

In the statement, The AusIMM has offered to assist the New Zealand Government in considering and implementing the Royal Commissions findings.

It is proposed that the AusIMM’s Health and Safety Committee and New Zealand Branch will jointly co-ordinate any support that the New Zealand Government wishes from The AusIMM, and the AusIMM will write to the New Zealand Government to offer our support in this regard.

AMMOP launch event set for February 2013

by Stephanie Omizzolo, Publication Projects Coordinator, The AusIMM

The AusIMM’s much anticipated release of the third edition of Australasian Mining and Metallurgical Operating Practices (AMMOP) is soon to be met. The publication will shortly be sent to the printers, and will be ready to be released on 14 February 2013 in Melbourne, at an exclusive book launch event.

AMMOP includes 187 papers, covering 218 mine sites and metallurgical operations across Australia, New Zealand, Papua New Guinea and Fiji. The publication will be spread across two volumes of 1000 pages each.

Along with the operations-focused papers, AMMOP also includes commodity overviews; introductory papers on key industry topics such as environment, health and safety, research and education; and commodity specific maps showing all operations that have been included in AMMOP.

As mentioned in various newsletter updates over the past year, AMMOP is the new iteration of a classic AusIMM publication first published as Monograph 10 in 1980 with a second, two-volume edition (Monograph 19) published in 1993 — often referred to as the Mawby Volumes.

The idea for producing an updated edition of the Mawby Volumes had been discussed in the Metallurgical Society since about 2000, and some preliminary work was undertaken over several years. In 2010, with support from Leigh Clifford who championed the project, mining companies agreed to sponsor the project and a Project Committee was formed that included representatives from the Mining Society and a Project Team led by Rob Burns FAusIMM and with John Rankin FAusIMM(CP) the Volume Editor of AMMOP, and AusIMM Services staff.

The Project Committee, chaired by Peter McCarthy FAusIMM(CP), along with the Project Team, have been working hard over the past three years to bring this publication together and ensure its success. The support from industry sponsors has been extensive and we are very appreciative of this support in order to make the publication possible.

Thanks to Principal Sponsor Rio Tinto, Major Sponsors Anglo American, AngloGold Ashanti, BHP Billiton, MMG, Newcrest, Newmont, Xstrata along with Sponsors AMC Consultants, Atlas Iron, Ausenco, Centennial Coal, Gold Fields, Iluka, Lycopodium, Ok Tedi, Sandvik, Vedanta Resources, Wesfarmers and Western Areas.

There has been a great level of involvement across The AusIMM’s membership base in the production of AMMOP, with many Societies and Committees assisting with the writing and reviewing of papers, organising submissions from companies, and providing input and guidance into the content of the publication.

The book launch for AMMOP will be held on Thursday 14 February 2013, from 6 pm at Comme, 1 Alfred Place, Melbourne Victoria. Along with the Project Committee, authors, reviewers and sponsors, AusIMM members who are interested in attending the book launch are invited to register (limited places available).

If you are interested in attending, please contact me via 03 9658 6166 or via email somizzolo@ausimm.com.au.
Appendix 1: National Mine Safety Framework 2011-12

One of the Council of Australian Government regulatory reforms is to implement the NMSF to create a nationally consistent health and safety regime in the Australian mining industry by delivering the following strategies:

1. nationally consistent legislative framework (consistent with the provisions of the nationally
   uniform workplace health and safety model legislation)
2. competency support
3. compliance support
4. nationally coordinated protocol on enforcement
5. consistent and reliable data collection and analysis
6. effective consultation mechanisms
7. collaborative approach to research.

The information following details the progress made against key milestones:

Strategy 1. Drafting instructions for a nationally consistent legislative framework

NMSF Mining Work Health and Safety Mines Regulations (Chapter 10) are now in their 18th version and are close to finalisation.

As an adjunct to Strategy 1, New South Wales, Queensland and Western Australia are developing legislative proposals in addition to Chapter 10, to provide mine safety regulations suited to the level of mining activity in those states and with consistent operational provisions.
It is anticipated that New South Wales, Queensland and Western Australia will implement new mine safety provisions during 2013.

**Strategy 2. Industry competency**

A proposal is being developed to establish a training and competencies advisory committee to provide oversight and consistency in training and competency requirements across New South Wales, Queensland and Western Australia.

**Strategy 3. Finalise development of an online repository of compliance information to assist duty holders by December 2010**

The Compliancegate site was established prior to the 10 August 2010 NMSF Steering Group meeting where it was demonstrated by Professor David Cliff, from the Minerals Industry Safety and Health Centre (MISHC), University of Queensland. Feedback from jurisdictions was sought at, and subsequent to, the meeting. The site became publicly available on 4 March 2011. [www.mirmgate.com/index.php?gate=compliancegate](http://www.mirmgate.com/index.php?gate=compliancegate)

**Strategy 4. Establish a national regulators forum by June 2010**

The national regulators forum is currently expected to take place on 1-2 November 2012 with the objective of establishing a nationally consistent approach to regulatory enforcement.

**Strategy 5. Progress of the database for consistent and reliable data analysis**

SRA Information Technology was approved as the preferred tenderer at an SCER standing committee of officials meeting on 18 April 2011. The milestone for the finalisation of the database was delayed because the development was not completed until May 2012. However, SRA Information Technology is currently reviewing an agile development model, which may shorten the development timeline and bring this date forward. This delay did not affect the achievement of the 2012-13 milestones for jurisdictions to commence inputting data into the national database from 1 July 2012.

**Strategy 6. Effective consultation mechanisms**

The work on this strategy involved the development of a national consultation framework that identified broad legislative requirements regarding the duty of an employer to consult, and how and when consultation should occur. The consultation framework was endorsed in the NMSF implementation report, and effectively wrapped up into the NMSF legislative framework drafting instructions.

**Strategy 7. Research strategy overview**


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**Australian work health and safety strategy 2012-22**

Safe Work Australia has released an Australian Work and Health Safety Strategy 2012-22.

The strategy does not include industry-specific priorities or targets, but sets out a framework of priority issues and actions for all Australian health and safety regulators for the next decade. The key targets set out in the strategy are:

- a reduction in the number of worker fatalities of at least 20 per cent
- a reduction in claims resulting in one or more weeks off work of at least 30 per cent
- a reduction in claims for musculoskeletal disorders resulting in one or more weeks off work of at least 30 per cent.

Ground penetrating radar (GPR) is a non-invasive geophysical method that uses backscattered and reflected electromagnetic waves to image the subsurface, offering the highest resolution of any geophysical method. Although the first radar surveys were performed in the late 1920s, geotechnical applications did not commence until the 1970s.

In impulse GPR systems, a short pulse (nanoseconds) of electromagnetic energy is transmitted into the ground, with some of this energy reflected back from interfaces of media with contrasting electromagnetic properties (permeability, permittivity and conductivity). The amplitude and time delay of these reflections allow the subsurface to be imaged and GPR is now routinely used in a broad range of applications, including near surface stratigraphy, utility mapping, civil engineering, and unexploded ordnance surveys. The greater the difference in dielectric constant between two materials, the stronger the reflected pulse energy becomes. Electrical conductivity controls the depth of penetration, with lower conductivity allowing greater penetration depth. Penetration depth is also a function of antenna frequency, with low frequency antennae (eg 25 MHz) penetrating several tens of meters, whereas high frequency antennae (eg 1.6 GHz) may penetrate only a few centimetres but provide extremely high resolution in concrete scanning surveys.

Several manufacturers now produce GPR systems which have been designated intrinsically safe for use on mine sites.

The last decade has seen rapid developments in GPR hardware, with the emergence of multichannel GPR capable of imaging in 3D in real-time. GPR software is also now vastly improved, in terms of both signal post-processing and 2D mapping and 3D visualisation of the subsurface, a vast improvement on simple 2D radargram transects (‘scans’). Likewise, the more sophisticated GPR operators will have several different antenna frequencies in their ‘armoury’, which can be quickly interchanged on-site, offering a wide range of capability on any given survey day or subsurface conditions encountered. Because of the depth of penetration, broad range of survey functions, and rapid data acquisition, GPR has a multitude of application on mine sites, especially concerned with safety and minimising risk. Some of these applications are outlined briefly below.

**Stratigraphy and structure ahead of mining**

Borehole-to-borehole GPR antennae can be used in cross-hole mode (tomographically) to image a cylindrical area with a radius of 10-100 m ahead of mining. This kind of survey ahead of mining can locate areas susceptible to roof rockfalls, such as where entries are driven under paleochannel margins. Hence, roof fall injuries may be reduced significantly when images of paleochannel margins are mapped and ground control measures are intensified, such as surface-deployed long strata bolts and grouting to improve stability.

**Detection of adjacent mine workings**

The Quecreek Mine event in Pennsylvania occurred on July 24 2002 when miners accidentally cut into the abandoned Saxman No 2 Mine, releasing millions of litres of water into the active workings. This event highlighted a need to be able to resolve and determine the presence of abandoned adjacent mine workings. This can be achieved in coal mines using GPR to identify adjacent workings at distances up to about a 60 m, using 80 MHz antenna, for example.

**Mine roof inspections**

GPR can be used in mine roof surveys to identify localised zones of bad rock characterised by separations or delaminations. Although GPR is sensitive to rock bolts and steel straps, GPR is particularly applicable for this kind of work because of the extreme contrasts in electromagnetic properties of air and intact sedimentary rock. Selected boreholes can then be made for borehole scanners to undertake more detailed analysis.

**Subsidence voids**

The emergence of subsidence voids at the ground surface, either from erosional piping, or upwards-void propagation from goaf or old tunnels, can be a hazard. GPR can be used to image large areas of the subsurface, with air-filled cavities causing signal ‘scattering’, often manifest on a radargram as a series of vertically-stacked reflections at depth.

**Subsurface utility mapping**

Cable ‘strikes’ caused by accidental excavation of unknown assets on sites can cause significant hazards, down-time and litigation. GPR, integrated with GPS, can be used in conjunction with radio frequency (RF) scans using a pipe and cable locating instrument to identify and map subsurface assets in detail. Both technologies, GPR and RF, complement one another to provide the most useful data set necessary for the locating and characterization of subsurface assets. Utilities can then be mapped using specifications/criteria as outlined in draft AS 5488 standards.

**Conclusion**

In summary, in the right hands, GPR can provide a powerful tool to image the subsurface at a range of depths and resolutions. Large areas can be scanned very quickly, and with significant time investment in post-processing and modelling of data, confident interpretations can be made. GPR represents important enabling technology for improving mine safety and productivity for both plant and personnel.

Dr Martin Brook can be contacted via mbrook@moultrie.com.au.
Contribute to The AusIMM Bulletin

Features for the 2013 series of The Bulletin have been set, they include:

**April edition**  
Article proposal deadline 31 January
Regional Feature: Western Australia  
Workforce diversity  
New technologies  
Greenfields explorations  
Geotechnical engineering

**June edition**  
Article proposal deadline 29 March
Regional Feature: Northern Territory  
International Focus: Asia-Pacific  
Iron ore  
Uranium  
Mineral Processing

Members who have an interest in contributing editorial should contact the Editor via editor@ausimm.com.au.

Contribute to Health & Safety News

The Health and Safety Committee is always looking for fresh ideas to make the Health & Safety News as lively and interesting as possible for our readers.

If you have any feedback, would like to make a suggestion or contribute to the Health & Safety News with an article or comment piece, do not hesitate to contact us.

Please email the Secretariat, Donna Edwards via dedwards@ausimm.com.au.

Social media

Remember to connect with The AusIMM across our various social media pages.

www.twitter.com/theausimm | www.facebook.com/ausimm | www.youtube.com/theausimm  

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CALL FOR CASES
Abstract Submission Deadline: February 1, 2013

Responsible Mining: Sustainable Practices in the Mining Industry
A book edited by Dr. Michelle Jarvie-Eggart, Barr Engineering and University of Maryland
University College, USA and Dr. Helen E. Muga, University of Mount Union, USA

To be published by Society for Mining, Metallurgy, and Exploration (SME):
http://www.smenet.org/

Introduction

Current practitioners in the industry are not always aware of best practices. Junior mining companies, in particular, can face resource and personnel limitations which make it difficult for them to do the necessary homework to even understand what sustainability means in the context of mining, let alone how to address the issue within their organizations.

There is a need to describe the voluntary measures the mining industry is taking to address sustainability. The text would include a description of what sustainability means to the mining industry (managing social, environmental, and economic risks), the demand for these efforts by NGOs and the international community, various industry associations to address the issue, their programs and implementation, common themes emerging among the programs, and case studies highlighting efforts along these themes.

Overall Objective of the Book

The objective of this book is to provide the reader with an understanding of the concept of sustainability as it is applied within the mining industry, the various industry organizations involved in addressing sustainability within mining, and examples of best practices at companies and mining operations. This work seeks to present case studies of best practices, which can be used for examples and inspiration to those working within the mining industry, as well as students and educators.

Target Audience

The target audience of this book will be comprised of professionals practicing within the industry, students, and educators. Material in this book will cover multiple disciplines, and may be of appeal to various types of engineers, biologists, social scientists and business people. This text is meant not only to provide examples of best practices to those working in the industry, but also to be of use to educators teaching courses in or related to sustainability within mining.

Case study chapters are solicited highlighting efforts to address various issues within a company or at an operation. These chapters should present best practices in the developed world. Chapter length should be approximately 10,000 words. (Recommended topics include, but are not limited to, the following):
Biodiversity
- Methods to measure and quantify baseline biodiversity at mine sites
- Biodiversity action plans
- Ecosystem services
- Biodiversity offsets
- Biodiversity management at active sites.

Closure/Reclamation:
- Approaches to planning for new uses post-mining
- Community engagement in closure/reclamation planning
- New and unusual reclamation practices

Energy/GHGs:
- Energy management efforts
- GHG reduction efforts
- GHG Offsets

Community of Interest Engagement/Participation:
- Efforts to identify communities of interest (COI, those affected by the mining operation)
- Efforts to engage COIs
- Free, Prior and Informed Consent (FPIC)

Environmental Monitoring/Compliance
- Environmental Assessment and baseline studies
- Post-closure monitoring
- Zero liquid discharge and other approaches to the elimination of monitoring points
- Citizen-science and monitoring partnerships

Safety/Crisis:
- Efforts to improve safety on site
- Crisis response and communications efforts
- Employee mine rescue teams

Tailings/waste:
- Tailings management
- Efforts/research for tailings consolidation (particularly for oil sands)
- Waste rock stockpile management by grade

Water:
- Efforts to conserve or recycle water on mine sites
- Effluent quality improvement efforts
- Approaches to protecting surrounding water resources
- Site Storm water runoff
Financial Community Response

- Extractive Industries Transparency Index
- Integrated sustainability and financial reporting
- Other appropriate topics

Submission Procedure
Researchers and practitioners are invited to submit on or before February 1, 2013, a 1-3 page abstract clearly explaining the mission and concerns of his or her proposed case. Authors of accepted proposals will be notified by March 1, 2013 about the status of their proposals and sent case guidelines. Full cases are expected to be submitted by May 1, 2013. All submitted cases will be reviewed on a double-blind review basis. Contributors may also be requested to serve as reviewers for this project.

Publisher
This book is scheduled to be published by the Society for Mining, Metallurgy, and Exploration (SME). For additional information regarding the publisher, please visit www.smenet.org. This publication is anticipated to be released in 2014.

Important Dates:
February 1, 2013: Abstract Submission Deadline
March 1, 2013: Notification of Acceptance
May 1, 2013: Full Case Submission
July 1, 2013: Review Result Returned
Aug 1, 2013: Final Case Submission

Inquiries and Submissions can be forwarded electronically (Word document) or by mail to:

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