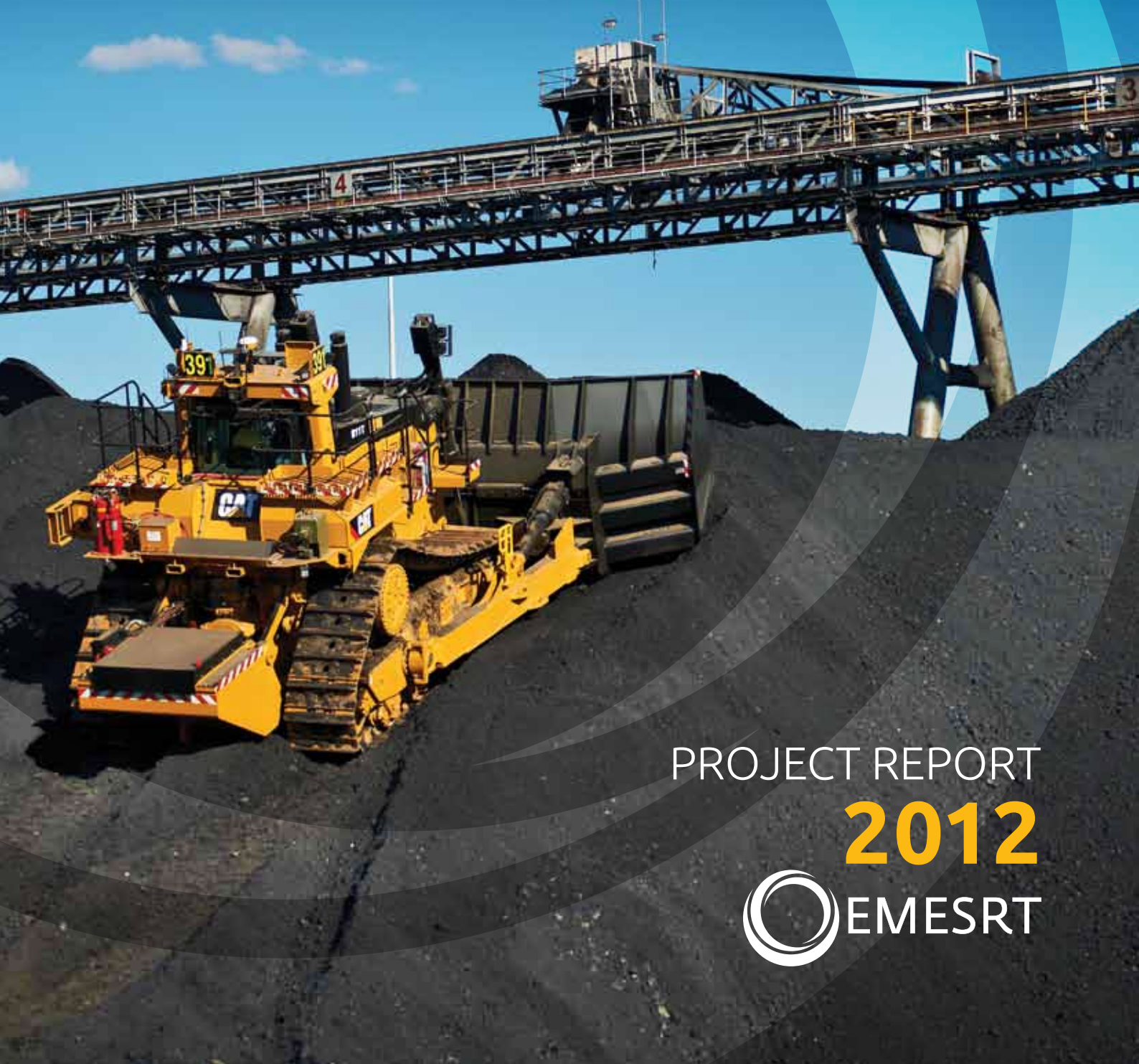


*WE HAVE A*  
**VISION...**



PROJECT REPORT  
**2012**



# OUR VISION

A mining industry free of fatalities, injuries and occupational illnesses associated with operating and maintaining heavy-duty mining equipment.

# OUR OEM PARTNERS

EMESRT engages with 7 of the top Original Equipment Manufacturers in the mining industry. EMESRT appreciates the positive reception and many opportunities to work together that they have provided.



## THE MIGHT OF THE ROUND TABLE



Excerpt from *The might of the round table; EMESRT provides one voice to accelerate safer equipment designs*, an article by Herb Mathisen in the December 2012 / January 2013 issue of CIM Magazine.

*“Major mining companies speak with one voice to accelerate safer equipment design”*

Until recently, modifying earth-moving equipment [for safety compliance] was generally accepted as a cost of doing business for miners, says Tony Egan, Xstrata Coal’s business development and special projects manager.

Tony has been active in safety improvement through equipment design for over 20 years and was a founding member of EMESRT in 2006. Xstrata is a member of the EMESRT Advisory Group.

*“We got pretty good in Australia at actually modifying stuff [base models] locally with the dealers,”* he says, although this process often delayed the delivery of their multi-million-dollar equipment by up to eight weeks and, accordingly, increased costs.

Egan wondered why the safety features he was waiting for were not available on all factory-made equipment to begin with.

Companies like his had been asking equipment designing departments for safety features that went beyond ISO standards, but original equipment manufacturers (OEMs) were unable to respond to their clients’ divergent requests and, with the splintered voices from industry, manufacturers could not justify the cost of making changes.

This drove Egan to come up with a novel strategy. If many companies, backed by their combined purchasing power, could come together to speak with one voice to manufacturers’ marketing departments – the holders of the research and development purse-strings – then OEMs would be compelled to listen.

That was the beginning of the Earth Moving Equipment Safety Round Table (EMESRT), which has grown over the last six years into a global conglomerate of 15 of the world’s largest mining companies. It would seem OEMs got the message: Egan says *“local assembly times have been reduced significantly”* – as much as 80 per cent.



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# WHAT IS EMESRT?

Since early this century, mining companies have jointly discussed the contribution of earth moving equipment design to unwanted events such as incidents, damage and production delays.

For six mining companies, these discussions evolved into a formal global initiative in 2005 called the Earth Moving Equipment Safety Round Table (EMESRT). The initiative was driven by the desire to fill the knowledge gap between customers and equipment designers, focusing on new designs where the opportunity for major change was not only possible but also made economic sense.

A mining customer engagement strategy with Original Equipment Manufacturers (OEMs) was developed which initially involved meeting with haul truck OEMs, discussing perceived issues (design philosophies or DPs), understanding each other's perspectives and overviewing related risk management approaches.

By 2011, EMESRT had expanded to fourteen mining companies operating in most major jurisdictions.

The design challenges had also expanded from surface haul trucks to all large mining equipment used in surface, underground coal and metal mining, as well as exploration drilling.

Another major change occurred in 2011. The mining company representatives decided to take the next step in the engagement strategy with OEMs. They connected the issues and methods that had been discussed in the past with a process of evaluating OEM equipment designs as part of the mining company procurement process. In other words, they decided it was time to progress from discussion to demonstrating change.

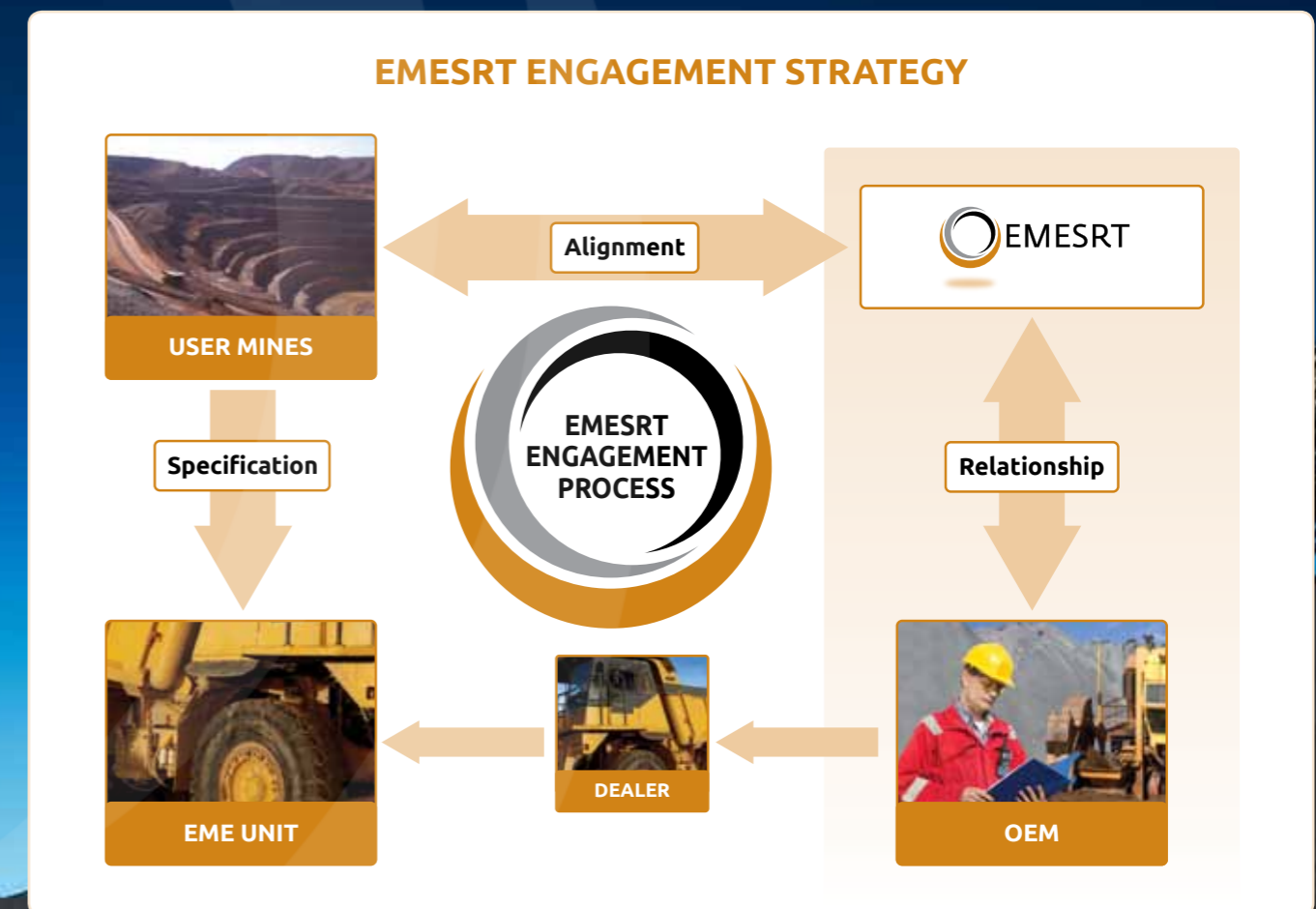
Now, EMESRT provides OEMs with an EMESRT Design Evaluation for Earth Moving Equipment Procurement (EDEEP). This is an opportunity for an OEM to demonstrate that they are going beyond standards and applying task-based design reviews, as well as clearly linking design features to priority issues.

## OUR PURPOSE

Accelerate development and adoption of leading practice designs to minimise the risks to health and safety through a process of original equipment manufacturers (OEM), contractors and user engagement.

## EMESRT DPs

1. Access & Working at Heights
2. Tires & Rims
3. Exposure to Harmful Energies
4. Fire
5. Machine Operation & Controls
6. Health Impacting Factors
7. Manual Tasks
8. Confined Spaces & Restricted Work Areas



*"EMESRT is extremely important in building a safe product, a standard product for delivery to any mining site, anywhere in the world."*

Randy Baker, President and COO, P&H Mining

# WHY IS EMESRT IMPORTANT?

It is unlikely that the mining industry can identify the true cost of problems related to equipment design issues, considering the cost of losses or the additional cost of site level improvements.

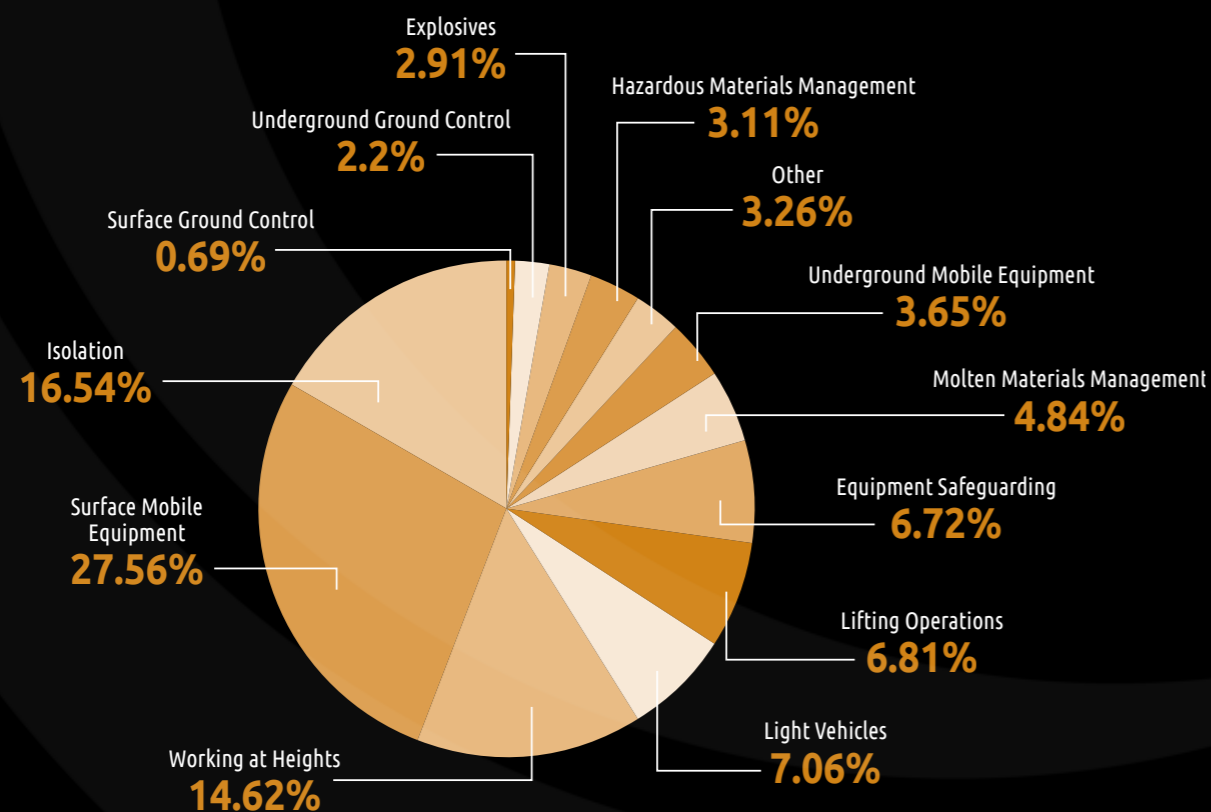
Evidence suggests that losses related to mobile equipment are a large portion of unwanted events but the specific contribution of design is hard to accurately measure.

However, anecdotal information from EMESRT member companies suggests that the contribution of design issues that affect operability and maintainability of equipment is significant. Cost implications range from major equipment damage and production down-time to injuries and fatalities.

EMESRT uses case studies of events experienced by member companies to identify the need for OEM improvements.

In 2013, EMESRT is investigating methods to investigate events that more clearly define any design contribution to losses in equipment operation or maintenance.

Total number of incidents: 2025



# TONY EGAN REFLECTS ON EMESRT

"It is easy to focus on discreet action items in our plans but lose sight of the strategy and purpose.

I have often pondered the issues we face since having this crazy idea in July 2005. When we all first met as mining companies, we compared our companies' mission statements and saw essentially they were all the same. When you look at what EMESRT has done, it supports the goals set out in these mission statements. Challenging EMESRT alignment in the annual strategy planning sessions has allowed us to maintain focus on our common goals.

Incident reduction plateaued in the nineties and noughties, but statistics show fatalities/major injuries have not followed the steady reduction in LTI/TRI that systems have delivered. The statistics show us they have a random pattern hence the 'Safety / Risk Management System' has addressed many areas but clearly not all. More recently, Fatal Risk Protocols have been introduced to further address this.

## SO HOW DOES THIS FIT WITH EMESRT

We all agree design is the most robust way to deal with inherent risks in equipment but, after lots of effort by individual companies over 25 years, no real embedded change had occurred. We saw drills modified at the factory in the 90's to address many key issues only to have all these improvements lost in subsequent model changes.

This is the design vacuum.



Equally, we have seen leadership changes in our companies and decisions taken which removed the improvements because they were 'optional'. Getting factory integrated solutions that are well understood is the sustainable long term solution.

EMESRT was created to allow a process of communication between OEMs and users which in time, if effective, would reduce/remove the design vacuum that exists between them.

Examples include integrated factory-fitted access systems which addressed the highest statistical problem we had seven years ago - one of EMESRT's successes. Lower cost and safer.

Once this vacuum is removed then technically EMESRT has no purpose in its current form. It's fair to say we have moved along the continuum, but we are not there yet.

**So, going forward, we should ask, not 'How does EMESRT fit into my organisation?' but:**

How will my organization's change over time to setup the communications systems and internal design/risk/procurement processes that prevent the vacuum reappearing and hence increasing my organizations exposure to fatalities and major injuries?

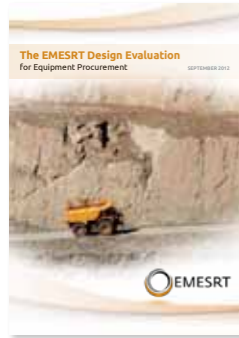
However, this is reliant on the OEMs having moved to a level of maturity that matches the processes you might install. Whether we like it or not they are market driven in their actions, so the big single voice will always carry weight in their decisions than the lone company, no matter how big they are.

EDEEP was the turning point in the journey as it sets up a process that can be accepted equally by the company and the OEM. In itself it will not reduce the vacuum, but it puts in place a process that will help shrink it.

The key to EDEEP is user involvement with designers, in identifying the unusual ways we operate and use equipment which puts our people at risk. If design can eliminate/prevent these scenarios occurring, then EMESRT has done its job."

# 2012: A SUMMARY

In 2012, EMESRT activities mainly involved making the major shift in strategy with the seven major global mining OEMs from communicating industry needs to defining a procurement based requirement.



The EMESRT Design Evaluation for Earth Moving Equipment Procurement Process (EDEEP) was developed as a concept in late 2011 then a quality draft of the process completed early 2012. This EDEEP binder of information was printed so that at least 5 copies could be

delivered as part of a consultation process to each of the seven target OEMs.

In late February and early March of 2012, representatives of the 15 EMESRT member companies visited the seven OEMs to reintroduce EMESRT and overview the new EDEEP process. OEMs were asked to take the EDEEP information, review it in the context of their design process and provide feedback to EMESRT about EDEEP so that the process could be finalised and presented at MINExpo in Las Vegas in September 2012. Finalisation workshops at MINExpo concluded the process.

In 2012, EMESRT also developed its new website, www.EMESRT.org, upgraded its publications and began to provide resources to help member mining companies introduce EDEEP to their own colleagues, their own acquisition personnel and other stakeholders.



EMESRT also operated workshops for Sandvik and Komatsu design engineers in Finland and Germany.

## WHAT NEXT?

The 2013+ Plan involves seeking further support from EMESRT mining company members to put EDEEP requirements into their acquisition process and communicate this change to the OEMs as a demonstration of market change. EMESRT will also operate regional workshops in 2013 and invite mining companies and OEMs to discuss the status of EDEEP and other EMESRT successes.

# MAKING A DIFFERENCE WITH EDEEP

The flow chart illustration shows the steps in The EMESRT Design Evaluation for Earth Moving Equipment Procurement Process (EDEEP).

Each step and the suggested method is outlined in a manual available from EMESRT intended for use by the OEMs.

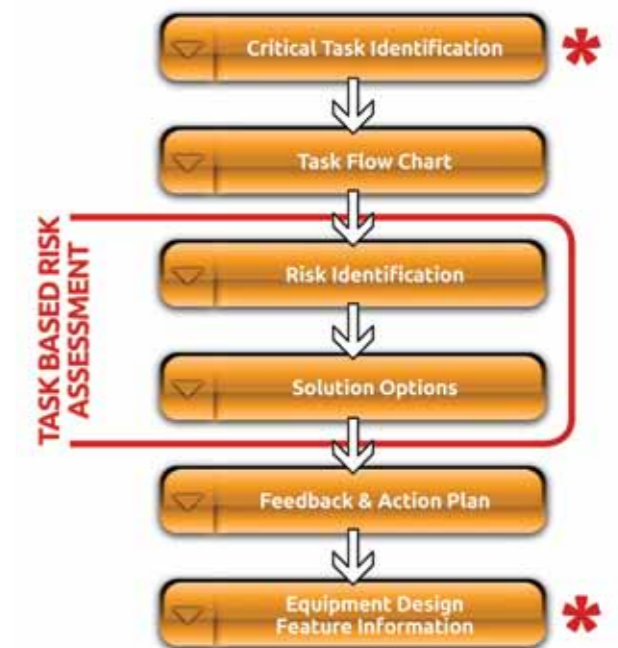
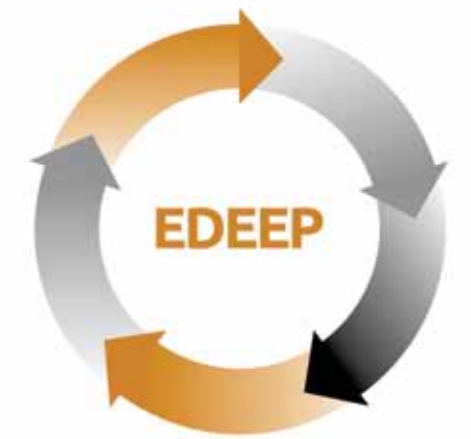
To successfully undertake the requirements of EDEEP, the OEM must examine each operating and maintenance task to be undertaken related to a type of equipment design such as a haul truck or loader. The examination must identify potential unwanted events related to a set of EMESRT prompts derived from 8 Design Philosophies.

EDEEP suggests that some tasks should be prioritised for further analysis based on risk. These priority tasks should be examined in a step-by-step manner similar to a Job Safety Analysis process commonly used by the industry.

By applying this method, the OEM can identify key planned design controls and potential areas of design improvement to reduce risks.

Finally, the equipment register of reviewed tasks, unwanted events and equipment design controls is provided to the mining company as part of the acquisition process.

EMESRT believes that successful application of the EDEEP process will not only improve design but also help mining companies get assurance that key design controls are clear, in place and not modified by site modifications.



*"Our participation with EMESRT has been the catalyst for a real cultural shift."*

David Farrar, Executive Vice President, LeTourneau

*"We need to go beyond Standards" – "This process needs to fit the design of all products"*

Quote from an OEM

# EMESRT take EDEEP to the OEMs

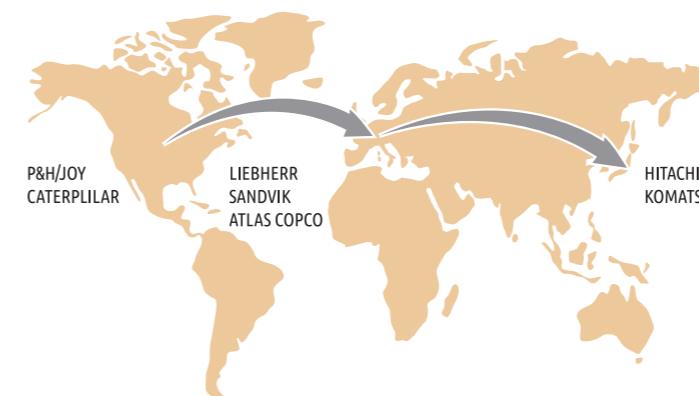
Representatives of EMESRT visited seven major manufacturers of surface and underground mining equipment during the early part of 2012. The primary aim of the meetings was to present the manufacturers with a proposal for a common approach to be used by EMESRT member companies during procurement.

The proposed Emesrt Design Evaluation for Earth Moving Equipment Procurement (EDEEP) process seeks information from manufacturers which identifies the safety critical tasks associated with the equipment, and design information which describes and evaluates the control measures put in place to control the associated risks.

The feedback received during the OEM meetings was generally very positive, although some concerns were expressed around the time and that would be needed to prepare the information requested.

A number of the OEMs took the opportunity to provide detailed information about responses to the issues highlighted in the Design Philosophies. The design safety processes described were generally focused on ensuring compliance with standards. While some risk assessment was undertaken at the design stage, the assessments were based on hazards, and not conducted at a task level.

The best processes described did attempt to gather input from experienced operators and maintainers. Often, however, these were the manufacturer's field staff.



Much of each meeting involved the presentation by EMESRT representatives of the draft EDEEP process including the revised set of eight Design Philosophies. The format of the Design Philosophies was altered to place greater emphasis on the potential unwanted events associated with each hazard, and remove information regarding industry attempts to mitigate the risks.

This change was a deliberate attempt to ensure designers looked for the optimal design controls.

All this information, and more, is available on the EMESRT website, [www.EMESRT.org](http://www.EMESRT.org)

The intent highlighted was that EMESRT member companies will, in future procurement processes, seek information from OEMs. This will describe the safety critical operation and maintenance tasks identified by the manufacturer, and design information to describe and evaluate the control measures implemented to control the associated risks.

*“The more we can harmonize at factory level the better for the industry as a whole.”*

Tim Murphy, Vice President, Sandvik

*“We have done design risk assessment reactively in the past but now we have developed an internal systematic approach “*

Quote from an OEM

# MINEXPO 2012

EMESRT exhibited at the MINExpo event for the second time. A booth space was acquired from the National Mining Association as had also happened in 2008.

This time EMESRT invested in development of a professional booth design with its new brand, strong displays and banners to enhance its presence and attract attention to their message.

Three identical sets of displays have been constructed so that the one used in MINExpo could be left in Denver for use in any EMESRT events in the Americas. The other two are located in South Africa and Australia for similar promotional purposes.

The booth at MINExpo 2012 was manned by EMESRT representatives and attracted significant interest.

EMESRT also led two workshops at MINExpo. The first was an open introductory workshop about EMESRT. The second provided an overview of the final EDEEP process for the seven major OEMs.

Both were well attended and discussion about EDEEP in the second workshop was excellent with specific discussion about the OEMs' desire to see some demonstration that the EDEEP process was formally a part of mining company procurement.



MINExpo was also an opportunity to introduce EMESRT to some smaller OEMs that supply equipment to the mining industry.



# THE WAY AHEAD IN 2013

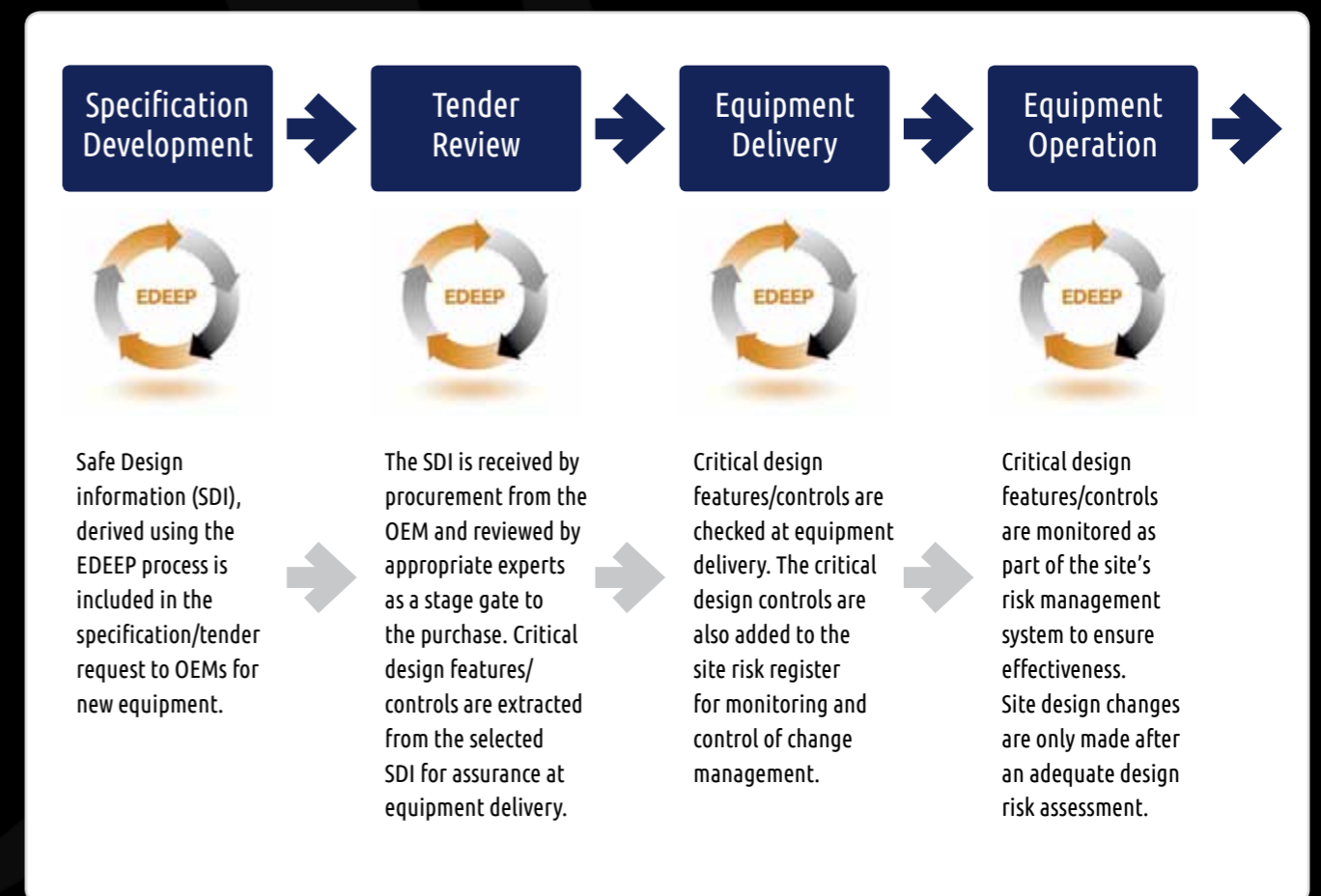
## Integrating EDEEP

2013 sees the introduction of the EDEEP process into member EMESRT mining companies.

EMESRT suggests that this integration can be seen as more than just a new OEM requirement. The illustration below suggests a potential approach to improving company risk with EDEEP.

This illustration was developed for inclusion in an introductory video intended for use with mining companies. It provides a model for discussion.

In 2013, EMESRT will track member company adoption of EMESRT and communicate that progress to the OEMs to further enhance the engagement process.





# OUR ADVISORY GROUP

## Michael Thuesen

**Anglo American - Principal Mining Engineer- Technology & Development Project-Surface Mining Machinery Automation**



Mike's field of expertise extends from technical design collaboration with suppliers to change management processes on site and in corporation and with relevant business case analysis.

He has over 25 years experience in the mining industry and is a Professional Certified Engineer with the Engineering Council of South Africa.

## Peter Prawak

**Barrick Gold Corporation - Senior Manager, Global Sourcing**



Peter has more than ten years of progressive experience in Strategic Procurement, Supply Chain, and Logistics. In his current role, he has responsibility for leading cross-functional teams on four continents and eleven countries to

maximize the value Barrick receives on a number of different spend categories. Prior to joining Barrick, he worked at Pitney Bowes, Purolator Courier, and Stelco Inc.

## Bob Dechant

**Barrick Gold Corporation - Director, Corporate Safety and Health**



Bob has worked in the metal/non metal mining industry for 35 years holding both operational and safety and health positions. He started his work with Barrick in 2005 in Russia and moved into safety and health planning and oversight for

Barrick's capital project sites globally.

## Herman Heukelman

**BHP Billiton - Manager, Engineering**



Herman is based at Middelburg Colliery, which forms part of BHP Billiton Energy Coal, South Africa. He has 15 years experience in the mining industry, which includes offshore, underground and surface opencast mining in gold, diamond

and coal sectors. He is a member of the Engineering Council of South Africa, and South African Institution of Mechanical Engineering.

## Jeff Jarvela

**Cliffs Natural Resources - Global Safety Program Manager**



Jeff is responsible for providing support to Cliffs' properties in capital projects, program development, incident prevention, regulatory compliance, and related training. Prior to Cliffs, he had 13 years of professional safety experience in

the airline, manufacturing, and warehousing industries.

Jeff is an active member of the American Society of Safety Engineers, National Safety Council, American Industrial Hygiene Association, and National Fire Protection Association.

## Neil Dorr

**Cliffs Natural Resources - Senior Director Safety, IH, and WC**



Neil is responsible for leading all occupational safety and health initiatives and accountability systems for Cliffs' properties globally. He has over 20 years experience as a safety and health professional. Prior experience includes safety leadership

roles in manufacturing, food processing, and agricultural product and chemical manufacturing.

## Robert Grewar

**Newcrest Mining - Group Fleet Manager**

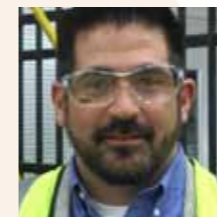


Robert manages both the Open Pit and Underground Assets across all Newcrest Operations. He has 25 years experience in heavy equipment and mining industries. In the various mining sectors, he has gained experience with Earthmoving

equipment from acquisition, through the maintenance life cycle to disposal.

## Ben Scholz

**Newmont Mining Corporation - Principal Mine Engineer**



Ben is a dynamic leader in health and safety with a strong management and engineering track record in 20 years in the mining industry. His current duties center on providing engineering guidance to study work streams to progress the project work

through feasibility studies and construction.

## Alan Miskin

**Peabody Energy Australia - Director of Safety and Health**



Alan has an Honours Degree in Mining Engineering from the University of Queensland and has worked within the Mining Industry for over 32 years in both operations management, technical and safety functional leadership roles in Australia and

overseas. Over the past 8 years Alan has had a focus on earth moving equipment safety and he participated in the team that originally formed the EMESRT group. He has continued to support the various initiatives in promoting its objectives.

## Iain Curran

**Rio Tinto - Principal Advisor for Heavy Mobile Equipment**



Iain is with Rio Tinto's Technology and Innovation Group, Brisbane.

He is accountable for the Global specifications of Heavy Mobile Equipment for Rio Tinto. Iain has extensive experience in both maintenance and operational management both on the OEM and Mining side. He has worked on numerous projects such as the Universal Dig and Dump Dragline and fully mobile in pit crushing systems.

## Lancaster Lawrence

**Suncor Energy Inc. - Overburden Operations Manager**



Lancaster is based at Suncor's Base Plant Operations in Fort McMurray, AB, Canada. He obtained his BSc. Engineering degree in mining from the University of the Witwatersrand in South Africa and has extensive international experience in mining,

both underground and open pit. He is registered as a professional engineer with The Association of Professional Engineers and Geoscientists of Alberta (APEGA).

## Mal Carroll

**Synchrude - Mine Mobile Maintenance Manager**



Mal has 18 years of experience in fixed and mobile mining equipment design, reliability and maintenance. He has held a number of technical and management positions in the Synchrude operation including in Research and Development, Mining

and Extraction Maintenance, Project Development, and Maintenance Planning and Scheduling. He is a member of the Canadian Institute of Mining and is a Professional Engineer registered in Alberta.

## Paulo Jose Gargano Rocha

**Vale - Corporate Manager of Security**



Paulo has 15 years experience in Engineering Occupational Safety and Process Safety.

He is currently responsible for the technical development and implementation of the Health and Safety Management System, coordinating engagement with operational areas and projects both in Brazil and overseas to build the measurement protocol.

## Tony Egan

**Xstrata Coal - Business Development & Special Projects Manager**



Tony has been active in safety improvement through equipment design for over 20 years and was a founding member of EMESRT in 2006. Xstrata is a member of the EMESRT Advisory Group.

## a tier commitment



**Professor Jim Joy**  
JKTech Pty - Facilitator of  
EMESRT Group

Professor Jim Joy is currently engaged in the establishment and growth of new business in providing global risk management services with JKTech.

Jim previously held the Anglo-American chair in mining risk management, to guide the establishment of a global Safety Risk Management System. The programme won the prestigious IChemE Award for 2009.

Jim is facilitator for the EMESRT group and has also been involved in corporate advisory roles to BHP Billiton, WMC and Xstrata Plc.

*"It is a privilege to facilitate the EMESRT project on behalf of the 15 member companies. EMESRT is a unique and influential project in the mining industry, increasing the speed of improvements in mining equipment design not only from identification of existing problems, but also by promoting and requiring 'beyond Standards' design approaches. These approaches enhance the human factors engineering of new equipment."*

*"Human factors engineering is more common among high tech manufacturers such as those producing military, space, aviation or nuclear equipment but the process is not complex. EMESRT and the huge market share that the member companies represent have simply motivated the OEMs to revisit their design process, challenging their focus on Standards based design development."*

**Robin Burgess-Limerick**  
MISHC - Professor of Human Factors



Robin is part of the Sustainable Minerals Institute, The University of Queensland, AUSTRALIA. He is a Fellow, of the Human Factors and Ergonomics Society of Australia. In 2006, he was a National Academy of Sciences Senior Research Associate at the Office of Mine Safety and Health Research, NIOSH Pittsburgh. Prof Burgess-Limerick has published more than 100 papers, book chapters and books.

### TIER ONE MEMBERS

Membership at the Tier One level involves companies in all areas of EMESRT including involvement in the Advisory Group that directs the entire project in all parts of the globe in all areas of mining including underground coal and soft rock, underground metal, surface (hard rock or soft rock and drilling / exploration).

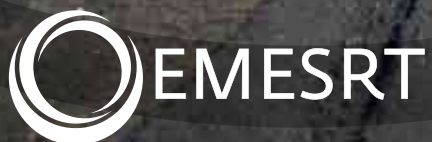
| Tier One   |
|--|
| <i>The annual fee paid by the following members is AUS\$63,000</i> |
| AngloAmerican  |
| Barrick  |
| BHP Billiton   |
| Cliffs Resources   |
| Newcrest Mining Limited  |
| Newmont  |
| Peabody Energy   |
| Rio Tinto  |
| Suncor Energy  |
| Syncrude   |
| Vale   |
| Xstrata  |

### TIER TWO MEMBERS

Membership at the Tier Two level involves companies that operate in one mining area such as one of underground coal and soft rock, underground metal, surface (hard rock or soft rock and drilling / exploration). These members observe the efforts of EMESRT and have access to resources.

Tier Two members are not part of the EMESRT Advisory Group.

| Tier Two  |
|---|
| <i>The annual fee paid by the following Tier Two members is AUS\$20,000</i> |
| Centennial Coal   |
| Collahuasi  |
| Sasol   |



For further information please visit our website or email  
[www.emesrt.org](http://www.emesrt.org) | [info@emesrt.org](mailto:info@emesrt.org)