

Current EMESRT Member Companies



The need for EMESRT

CUSTOMER ISSUES

- Regulatory compliance models have changed
- HSEC standards have steadily grown
- Mining Companies have expanded geographically
- No alignment on solutions between companies



The need for EMESRT (cont)

CUSTOMER ISSUES

OEM ISSUES

- Kept a base level with minimal safety options
- To many mixed messages from customers
- No alignment of the broad customer needs
- Major customers have forced some design solutions at the factory level



Design vacuum



- Sites have committed resources to improving designs
- Sites have encouraged 3rd party designs
- But there is potential conflict with add on designs
- Residual risk is not always identified



Thinking differently



- Marketing not engineers control new product development
- We needed a **critical mass** to influence Marketing
- Define **"Problems"** not stipulate **"control"** solutions
- Leave the OEM designers to develop solutions
- Enable users to critique a solution's ability to address the **"problem"** using a structured process



Managing Risk to ALARP



Companies' standards require Risk to be managed to

As
Low
As
Reasonably
Practical

The more serious the hazard the more robust and greater the number of controls



Hierarchy of Controls (Safety Precedence Sequence in US)



Elimination

Substitution

Engineering

Administrative

PPE

Most effective

The hierarchy of controls
in order of
effectiveness

Least effective

More than one barrier to control
significant hazards



Situation summary



- Customers still dictating add on solutions? **WHY**, have we stated what the industry needs and are the O.E.Ms inclined to offer more expensive solutions?
- Inadequate integration of multiple controls?
Controls supplied in isolation rather than total package?
- Inconsistent global application of solutions **WE HAVE THE SAME ISSUES**, but lack consolidated communications?
- Hierarchy of controls is not applied effectively
Because it is not applied in the base design?



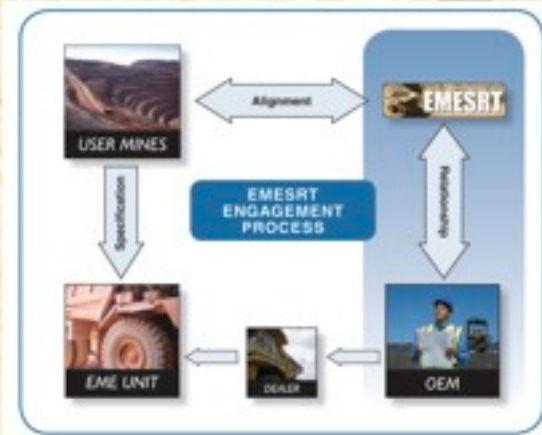
Situation summary



- Major Customers individually and spasmodically trying to influence OEM designs. **WHY** doesn't the OEM benchmark the best and provide it in the latest model?
- OEMs are in the best position to provide a quality solution provided they understand the issues adequately. **Integrated design is by far the best solutions.**



EMESRT Engagement Process



EMESRT Resource Materials



www.mirmgate.com/emesrt.asp



EMESRT OEM Design Maturity Chart

OEM Sales focus only – no customer involvement	Customer complaints are addressed	Some customer input is gathered	OEMs embark on "beyond standards" designing with customer	Customers & OEMs are engaged
Cost drives all	We react to our customers	We care about our customers concerns	Proactive We work together with our customers for better design	Resilient Engagement with our customers is how we do business
Regressive	Reactive	Planned		
Limited Standards Use in Design	Most Standards Considered in Design	Systematic Standards Based Design	Standards plus Proactive HFE Design	Integrated Stds & HFE Design
No Systems for Customer Input	Customer Compliant Action System	Customer Issue Survey Methods	Some OEM-Customer Design Input Mechanisms	OEM-Customer Design Process
No Incident Investigation	Limited Investigation	Regular Incident Follow Up	Joint Incident Investigation	Customer Supplied Incident Info is Integrated

JOY Engagement



Bucyrus Engagement



Engagement



- We have met with SANDVIK twice, the second meeting with SANDVIK was to discuss how they believed EMERST could help their business!

AND

- We have engaged positively Inbye Mining



How could it work?



1. A mechanism to input and change equipment specifications for the future.
2. A voice on behalf of the Industry to unify and promote one consolidated view.
3. The ability to align the O.E.Ms to deliver improved fit for purpose equipment.
4. The O.E.Ms able to react to one view not multiple company views on agreed requirements.
5. Engage O.E.Ms and end users in improving REAL fit for purpose equipment.



What does it look like?



Examples of industry attempts to mitigate risks

General Risk Mitigation

- A. Utilise Engineering techniques eg Failure Mode and Affects Analysis, CAT SIL Assessment, FEA analysis to provide equipment to a desirable Safety Integrity Level.
- B. Simplified circuits, interaction with hydraulic systems and components are becoming more integral with new equipment design.
- C. Installation and design is reflecting not only hydraulic component integrity but also the equipment working environment and housekeeping.
- D. Installation through sound design that eliminates or minimises hazards from normal work areas.
- E. System design that provides safe interaction with hydraulic components or systems
- F. Standards and guidance material being used to provide clear labelling, displays and or warnings to provide clear and understood instructions and information.
- G. Through design information identify and affect in service failure modes to eliminate the lifecycle injury risk profile.
- H. Provide sound commissioning and maintenance practices to sustain equipment integrity |



What does it look like?

The UG EMERST GROUP - Manual Tasks



Risks to be mitigated

Industry attempts to mitigate risks

- a. Reduced reach distance by rotating bolting rigs to increase work area; use height adjustable platforms
 - b. Reduced cable handling using a monorail and cable reelers
 - c. Reduced exertion during maintenance using simple mechanical aids
 - d. Using LHD to load pod on to continuous miner
 - e. Using LHD to load mesh on to continuous miner
 - f. Use platforms and monorail systems for transfer of equipment
 - g. Use handles to minimise pinch points and reduce force
 - h. Use pods for transport of conveyor structure
 - i. Install foot plates, platforms and stairs to minimise slips, trips and falls; reduce potential for hazard areas; improve access & egress
 - j. Use barriers for protection; racks for storage on miners
 - k. Use mechanical aids to minimise manual tasks
- Use bulk oil and fuel to minimise handling
 - Use air winches, pulleys and chain blocks to minimise handling



What does it look like?

Secondly Early DRAFT Equipment Access,



Risks to be mitigated

General Risks

- A. Hazard relating to uneven surfaces. I.e. Slip in platform, roof support pontoons
- B. Hazards related to environmental conditions, I.e. wet conditions, dust
- C. Designs introduce personal instability. I.e. stairs without handrails, uneven platforms, platforms on grades
- D. Injuries associated with poor body positioning during operation, inspection or maintenance
- E. Work platforms and egress systems have inadequate provisions for housekeeping/cleaning
- F. Risk of the inability of emergency egress or retrieval of injured personnel, where required
- G. Risk of injury caused by intrusions into operating and maintenance envelopes. I.e. brackets, hoses, consumable storage
- H. Injury due to poor visibility/inadequate lighting
- I. Risk of injury associated with non conformance to design standards I.e. tread heights, roof support toe plates
- J. The design creates limitation on operator visibility. I.e. Equipment canopies
- K. Risk injury due to access or egress of equipment when not in control of that equipment. I.e. auto roof support advance, radio remote miner operation
- L. Injury associated with using working platforms outside the design requirement. I.e. installation of ancillary services from equipment
- M. Injury occurs due to lack of consolidated ergonomic solutions, I.e. cabin access to cater for PPE, inadequate work space to safely perform designed task



What does it look like?

To explore a specific Design Philosophy click the CP files or head more' and access the relevant objective, outcomes, risks and mitigation examples.



- Equipment Access & Egress
- Working at Heights
- Noise
- Whole-body Vibration
- Fire
- Dust
- Isolation of Energy, Including Parking
- Visibility/Collision Detection & Avoidance
- Machine Stability/Slope Indication
- Guarding
- Controls and Displays
- Tires & Rims
- Manual Handling
- Operator Workstation
- Confined Spaces



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