



# Driving mining equipment design improvements through engagement

- On behalf of EMESRT -

Phil Roberts (Xstrata)



# Overview



- The EMESRT Story
- EMESRT resource materials
- EMESRT in 2009
- Measures of EMESRT success





# How EMESRT came to be



- The need for EMESRT
- A new approach



# The need









## CUSTOMER ISSUES

- Poor Health & Safety performance
- Duty of Care model - Systems Approach
- HSEC expectations have steadily increased
- Mining Companies have expanded globally
- Minimal alignment between companies







## CUSTOMER ISSUES

## OEM ISSUES

- Base level equipment with minimal safety options
- No alignment of the broad customer needs
- Major supply agreements have forced some design improvements at the factory level
- Too much 'static' in the message from customers





**CUSTOMER  
ISSUES**

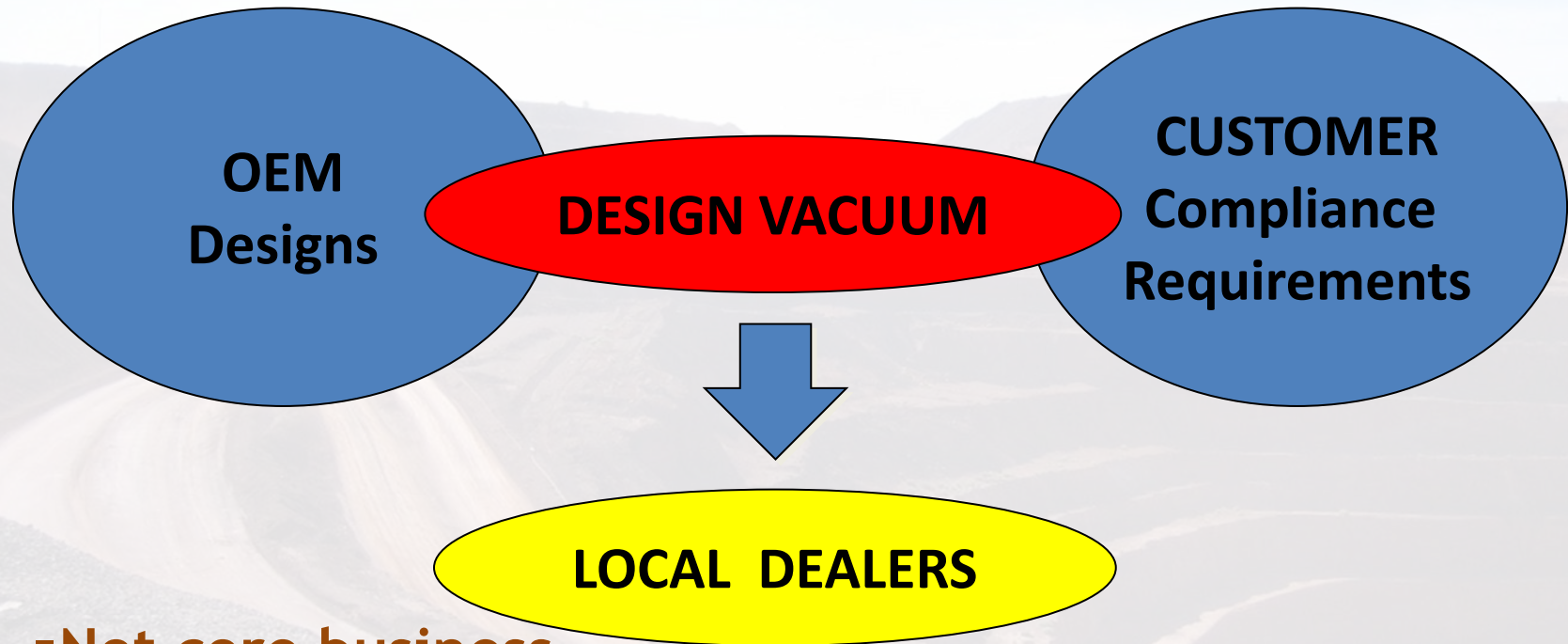
**DESIGN VACUUM**

**OEM  
ISSUES**

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







- Not core business
- Lack appropriate design resources
- Liability not fully understood
- Long lead time to Users
- Higher costs and low level of support from dealers



# Situation summary



- Customers still dictating add on solutions
- Inadequate integration of multiple solutions
- Inconsistent global application of solutions
- Hierarchy of controls is not applied effectively
- Major Customers individually and spasmodically trying to influence OEM designs
- OEMs are in the best position to provide a quality solution provided they understand the issues adequately.





# A new approach



**.....to accelerate development and adoption of leading practice designs for exploration and mining equipment to minimise the risk to Health and Safety through a process of Original Equipment Manufacturers (OEM), contractors and end user engagement**



# Engagement Strategy

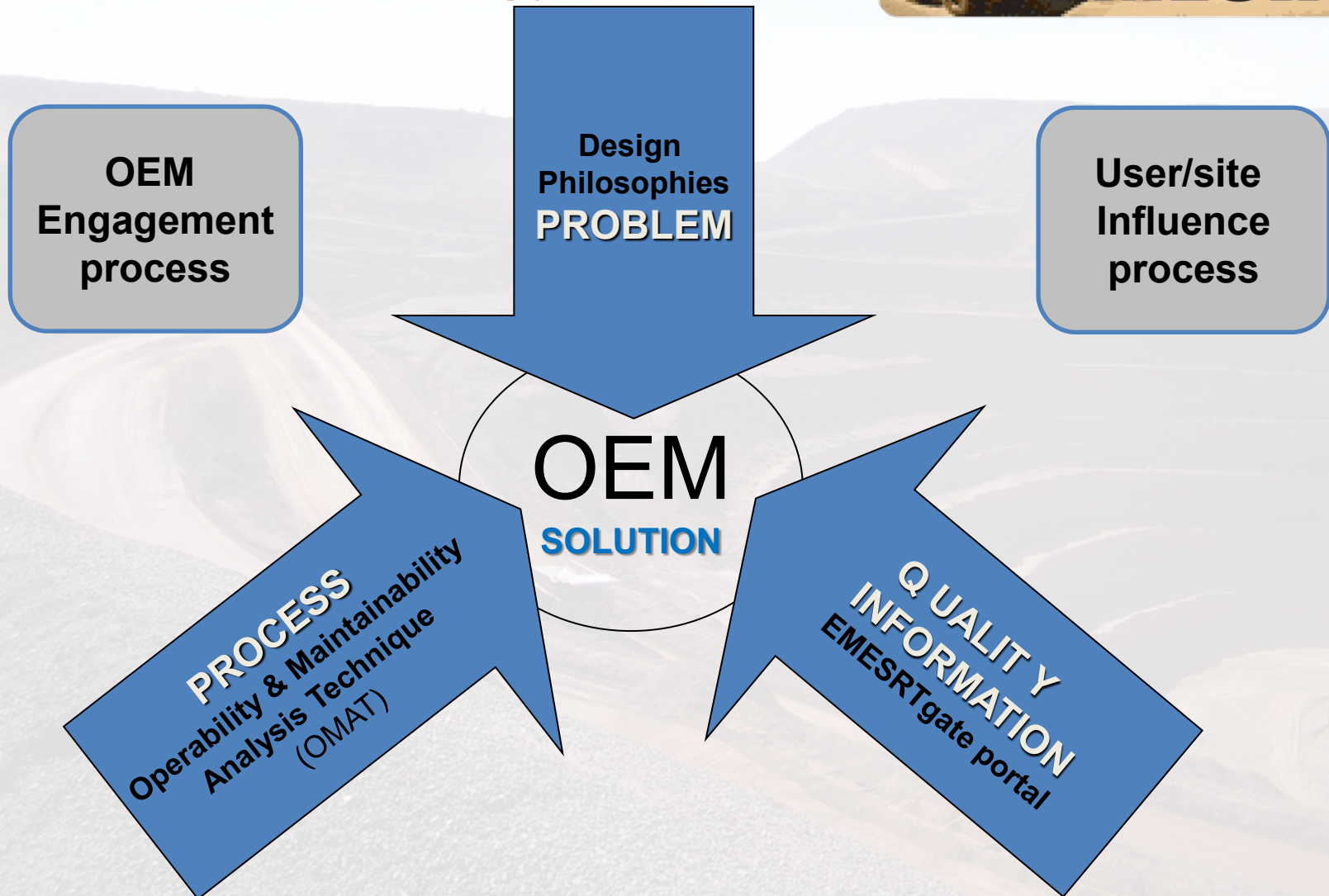


- Define the **PROBLEM** (EMESRT - aligned company views)
- Design the **SOLUTION** (OEMs)
- Develop **information resources & process/tool** to assist OEMs evaluate design solutions (EMESRT/MISHC)





# EMESRT strategy



# EMESRT Historical pathway



- 2005 –
  - BHP Billiton, Rio Tinto and Xstrata Coal discussions
- 2006 –
  - Anglo, BHPB, Xstrata, MISHC – met
  - Rio Tinto, Phelps Dodge (now Freeport McMoRan) & Newmont involved
  - ACARP funding for MISHC to assist EMESRT
  - OEM engagement strategy developed & visits made
- 2007 –
  - Barrick became involved
  - MISHC involvement now funded by member companies
  - 2nd round of meetings with OEMs
- 2008 –
  - Vale became a member





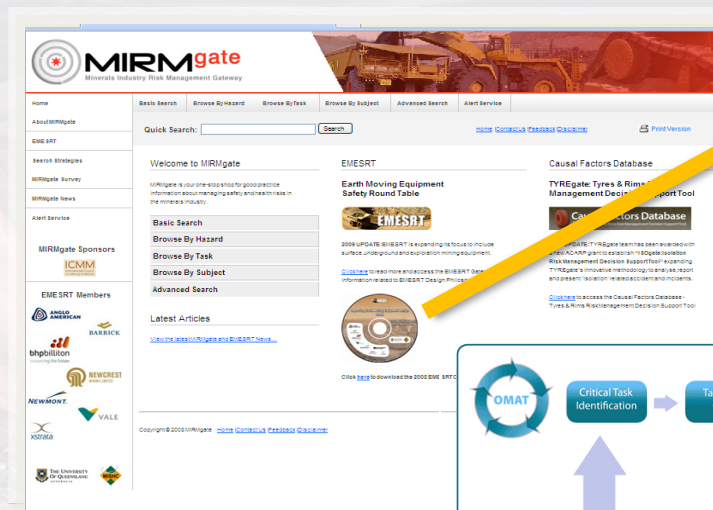
# EMESRT Resource Materials



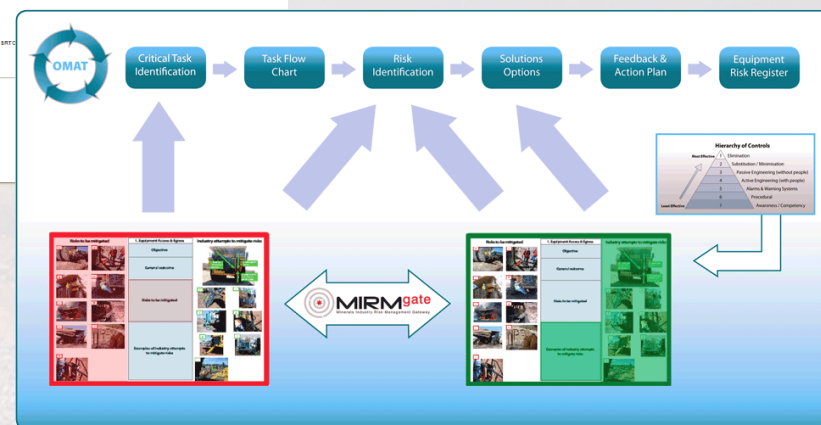
## EMESRT DPs

1. Equipment Access & Egress
2. Working at Heights
3. Noise
4. Whole-body Vibration
5. Fire
6. Dust, DPM & other airborne hazards
7. Isolation of energy, including parking
8. Visibility/collision detection & avoidance
9. Machine stability/slope indication
10. Guarding
11. Controls & Displays
12. Tires & Rims
13. Manual Handling
14. Operator Workstation
15. Confined spaces

[www.mirmgate.com](http://www.mirmgate.com)



[www.mirmgate.com/emesrt.asp](http://www.mirmgate.com/emesrt.asp)





# ACARP

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#### UNDERGROUND

Health and safety, productivity and environment initiatives.



#### OPEN CUT

Safety, productivity and the right to operate are priorities for open cut mine research.



#### COAL PREPARATION

Maximising throughput and yield while minimising costs and emissions.



#### TECHNICAL MARKET SUPPORT

Market acceptance and emphasising the advantages of Australian coals.



#### MINE SITE GREENHOUSE MITIGATION

Mitigating greenhouse gas emissions from production of



#### LOW EMISSION COAL USE

Step-change technologies aimed at reducing greenhouse gas emissions.



#### MINING AND THE COMMUNITY

### Development of the Operability and Maintainability Analysis Technique for Use with Large Surface Haul Trucks



Open Cut » Occupational Health & Equipment Safety

Project Number: C17033 Published: May 09

Author: Tim Horberry, Sabrina Sarno, Tristan Cooke, Jim Joy | Minerals Industry Safety and Health Centre, University of Queensland

This report describes research that developed and trialled the Operability and Maintainability Analysis Technique (OMAT) for large haul trucks operating at surface mines. OMAT was developed to help identify, prioritize and eliminate or mitigate any potential safety issues found in new and current earth moving equipment, specifically through the application of human factors engineering. The project concentrated on developing the OMAT method, and then evaluating it with mine site users and Original Equipment Manufacturers (OEMs).

This report is in two parts: the first part describes the method used to develop the OMAT technique. This process included reviewing related literature/techniques, trialling the technique at two operational sites and making modifications to the draft technique as required.

The second part of this report is a full OMAT process description, to enable the use of the Operability and Maintainability Analysis Technique by various parties. It contains an introduction and explanation about the OMAT process and descriptions on the six steps to be undertaken to complete the OMAT tool.

<http://www.acarp.com.au/abstracts.aspx?repId=C17033>





Earth Moving Equipment Safety Round Table (EMESRT) presents examples and outcomes aimed to accelerate development and adoption of leading practice designs for earth moving equipment to minimise the risk to Health and Safety.



EMESRTgate  
EARTH MOVING EQUIPMENT SAFETY ROUND TABLE

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EMESRT is a round table enterprise run through the University of Queensland to help promote best practice earth moving safety initiatives.  
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## EMESRT



The Earth Moving Equipment Safety Round Table (EMESRT) was formally established in 2006 by six global mining companies to establish a process of engagement between Original Equipment Manufacturers (OEMs) and mining customers. Member companies in 2009 are [Anglo American](#), [Barrick](#), [BHP Billiton](#), [Vale](#), [Newcrest](#), [Newmont](#) and [Xstrata](#).

## EMESRT Vision

A global industry free of fatalities, injuries and occupational illnesses associated with operating and maintaining exploration and mining equipment

## EMESRT Purpose

Accelerate development and adoption of leading practice designs to minimise the risk to Health and Safety through a process of Original Equipment Manufacturers (OEM), contractors and user engagement

## EMESRT Design Philosophies

Fifteen priority topics for Surface earth moving equipment have been identified by the EMESRT Surface Group, where incorporation of human factors issues early in the

## EMESRT Keywords

access being control controls  
design designed **due** during  
energy equipment exposure  
illness including **injury** intended  
isolation lack machine minimise  
noise **not** operator other  
outcome points rim **risk** seat  
should systems

## Quick Search



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[Surface » Equipment Access & Egress](#)

Design Philosophy:

## Equipment Access & Egress

Objectives & Outcomes

Risks

Mitigation Examples

### Risks to be Mitigated



Risk of collisions due to persons and small vehicles being positioned on the operator's blind side  
(15 resources)



Risk of collisions due to operator vision from the cabin being restricted by machine access and other structures  
(30 resources)



Risk of slips trips and falls during access to service points and work platforms due to lack of fall from height protection, slippery surfaces, accumulation of dirt or other material or poorly lit at night  
(12 resources)



Risk of sprains and strains due to ergonomically difficult body positions when accessing equipment

EMESRT Keywords

**access** accumulation being collisions driver's due equipment ground level m machine minimise operator other persons platforms points risk service side



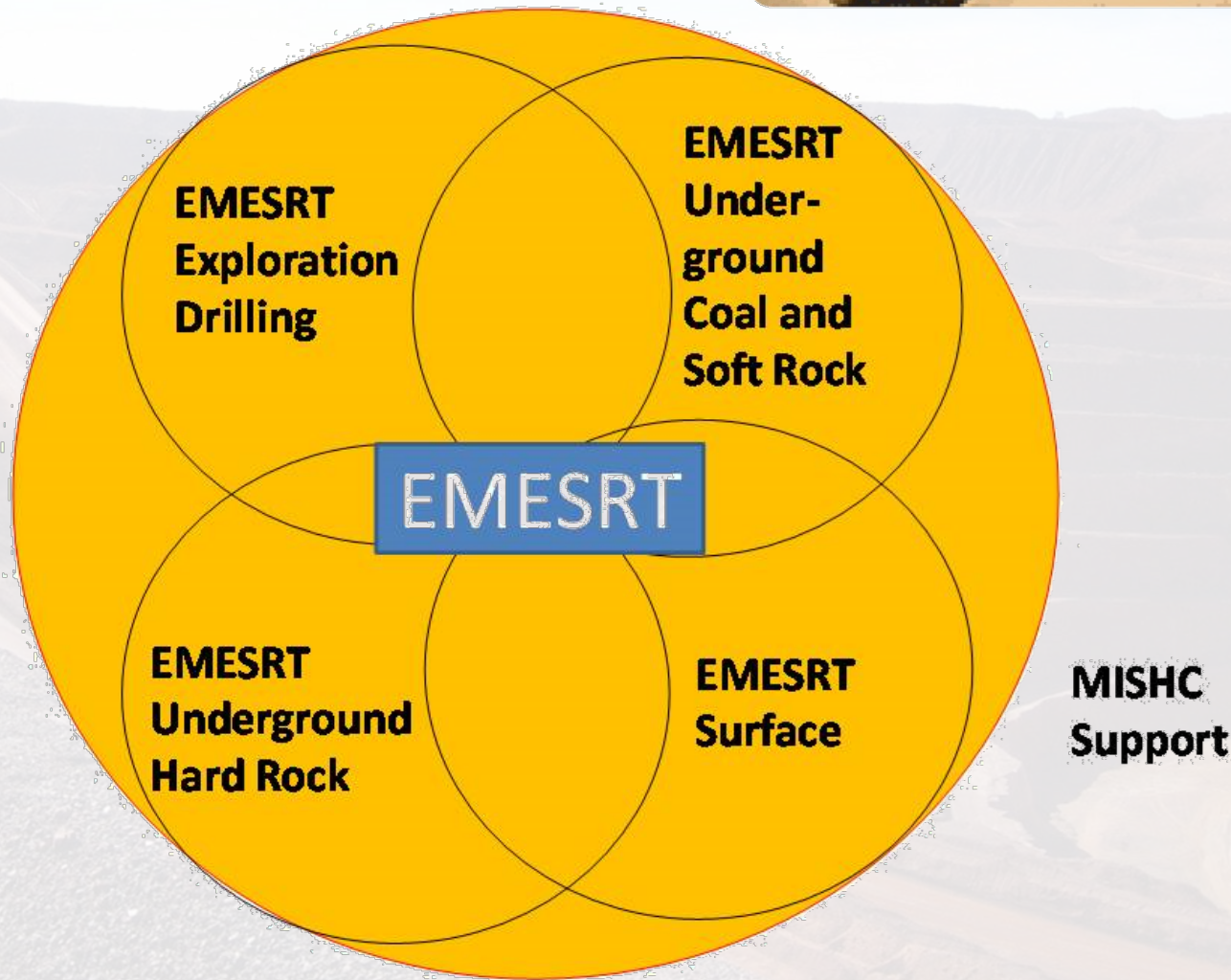
# EMESRT in 2009



- Expanded scope
- Membership changes
- EMESRT structure



# Expanded scope







EMESRT



2009





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# Current mode of operation



- Member companies pay annual fee for services provided by MISHC
- EMESRT Advisory Group provides guidance & strategic advice
- 4 EMESRT Technical groups undertake activities according to separate work plans



# Advisory Group Role



- Keeping / managing EMESRT to the Vision, Purpose, Scope
- Avoiding duplication to ensure alignment of all groups to OEMs
- Identifying leverage opportunities for all groups
- Establishing the image and marketing strategy
- Defining membership and seeking membership if required
- Ensuring consistency in the image (e.g. DP content)
- Strategic/governance/ financial/ resource prioritisation
- Overseeing re: MISHC resources





# Technical group activities



- Planning for engagement with OEMs specific to each group
- Developing EMESRT DPs about each group's specific equipment issues



# Measures of success



- OEM response to DPs & OMAT
- Consideration of DPs in review of Standards
- Interest from other stakeholders
- Reference to EMESRT resources by regulatory bodies





# Spreading the word



- EMESRT member company reps promote EMESRT at public forums internationally
- Next EMESRT presentations
  - Qld Mining Industry Health & Safety Conference (Townsville, Australia, Aug09)
  - Truck Shovel Users Group (TSUG) meeting (Fort McMurray, Canada, Sep09)
  - Longwall 2009 (Hunter Valley, Australia, Oct09)





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## EMESRT

### Earth Moving Equipment Safety Round Table



2008 UPDATE: EMESRT is expanding its focus to include surface, underground and exploration mining equipment.

[Click here](#) to read more and access the EMESRT Gateway to information related to EMESRT Design Philosophies.



Click [here](#) to download the 2008 EMESRT CD.

## Causal Factors Database

### TYREgate: Tyres & Rims Risk Management Decision Support Tool



2008 UPDATE: TYREgate team has been awarded with a new ACARP grant to establish "TYREgate Isolation Risk Management Decision Support Tool" expanding TYREgate's innovative methodology to analyse, report and present "isolation" related accident and incidents.

[Click here](#) to access the Causal Factors Database - Tyres & Rims Risk Management Decision Support Tool





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