Simple Solutions to Complex Problems –

ISOLgate /TYREgate / COLLISIONgate

A suite of Global Risk Management Decision Support Portals

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ABSTRACT

Incidents and accidents related to tyres and rims, isolation of energies, and equipment operation continue to occur within the mining industry. Brisbane based research team has developed an intuitive and innovative ***'Gate' Method*** and implemented the innovative approach to develop ***TYREgate: Tyres and Rims Risk Management Decision Support Tool.*** Successful application of the method on tyres and rims has led to development of ***ISOLgate: Isolation Risk Management Decision Support Tool.*** ISOLgate is modelled on the already proven TYREgate portal *(Kizil & Rasche 2008)*. Both TYREgate and ISOLgate establishment has been funded by the ***ACARP*** *(Australian Coal Association Research Program).* The project team has also developed two other innovative and unique approaches to enable ease of access to the system and its outputs known as ***'3 Click' Graph Searching Scheme*** and dynamically generated, downloadable topic specific ***'Checklists'.***

This paper introduces the intuitive **'GATE' Method,** its practical applications on 'TYREgate' and 'ISOLgate'. The paper will mainly focus on recently released ISOLgate and its key features and benefits including *'3 Click'* search scheme and popular *ISOLgate Checklists*. The project team has been awarded with a new funding to develop the 3rd Gate in the series; ***COLLISIONgate: a Vehicle Interaction Causal Factors Database and Risk Management Decision Making Tool.***

INTRODUCTION

To assist the mining industry in better prioritising its approach to Isolation, the joint MISHC/DEEDI ACARP (Australian Coal Association Research Program) funded project has developed **'ISOLgate: Isolation Risk Management Decision Support Portal'**.

ISOLgate provides the industry and its stakeholders including equipment manufacturers and service providers, with

- an objective up-to-date 'all in one' analysis and summary of accidents and incidents related to isolation,
- an overview of root and contributing causes (acts and conditions, design issues etc.) that must be addressed proactively to improve safety energy isolation procedures, and application in the field,
- Recommendations and risk controls, and ISOLgate Checklists assisting with workplace auditing process.

ISOLgate is modelled on the already proven **TYREgate: Tyres and Rims Risk Management Decision Support Tool** (http://www.mirmgate.com/tyregate). TYREgate and ISOLgate utilises a unique and innovative search methodology which allows managers, decision makers and other users with limited time to access dynamically generated, graphically displayed accident, incident and risk management data in 'near real time', using a **'3 Click'** approach.

ISOLgate is launched on May 3rd, 2010 and can be accessed at: http://www.mirmgate.com/isolgate. ISOLgate provides a further 'first call' portal for information and decision making support on this family of accidents and incidents.

INTUITIVE 'GATE' METHOD

Since the project team started working collaboratively in late 2007, they have aimed to establish a series of causal factors databases to address major mining risks to provide the mining industry with better and more objective decision making information:

TEAM VISION:

To provide industry stakeholders an intuitive real-time gateway tool to a series of integrated and near real-time causal factor databases of accident and incident data, and corresponding decision making information towards state of the art risk mitigation, risk management and business improvement – globally.

To achieve this objective, the project team has developed an innovative and unique '**Gate' Method** and implemented the Method on TYREgate during 2008-09 and then ISOLgate during 2009-2010. The illustration of the 'Gate' Method is given in Figure 1.

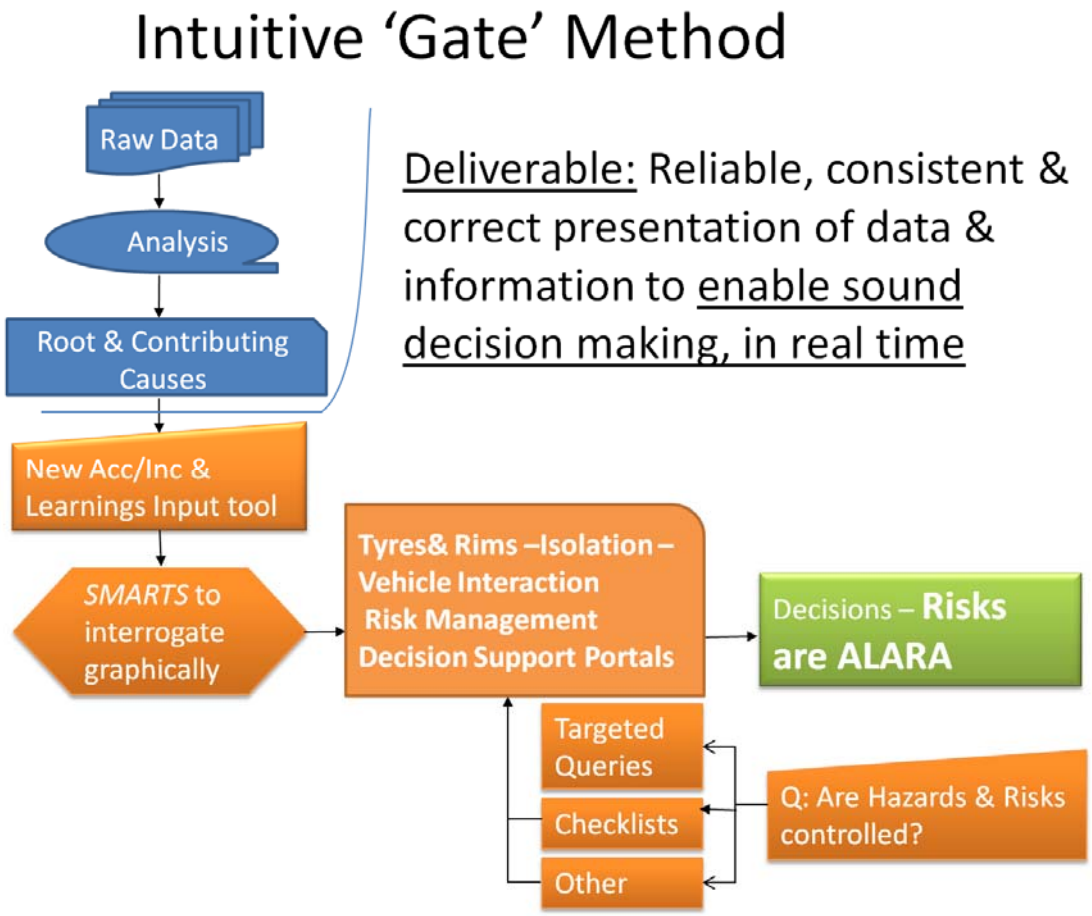


Figure 1. Intuitive 'Gate' Method (Kizil & Rasche, 2008-2010)

As such, ISOLgate builds on the very successful ACARP project C17032, ***'TYREgate: Tires and Rims Risk Management Decision Support Tool'*** *(Kizil & Rasche 2008)*. TYREgate provides industry with a detailed analysis of tyre and rim related accidents, as well as many recommendations towards safety and operational improvements.

A key point of TYREgate is that it forms the "pilot" for like projects towards creation of reliable databanks that will be of assistance across a range of design or safety projects.

Like the tyre and rim related accident and incident Causal Factors Database, *TYREgate*, the isolation incident and accident database and reporting portal, *ISOLgate*, is a ***'World First'*** searchable causal factors global database and provides the mining industry with a unique and complete source of information towards improvements.

TYREgate and ISOLgate form part of MIRMgate and accessible through MIRMgate home page.

TYREGATE / ISOLGATE DEVELOPMENT

TYREgate and ISOLgate is a collation of isolation related incident and accident data from the MIRMgate database and other publicly available sources such as Safety Alerts, Safety Bulletins or incident reports as these already provide detailed descriptions of the incidents or accidents, root causes and often risk mitigation steps. Each accident / incident is analysed by using the Incident Cause Analysis Method (ICAM).

ISOLgate Industry Consultation

Industry consultation was seen as a critical step in the ACARP funded 'ISOLgate: Isolation Risk Management Decision Support Portal' establishment. During the phase of the project, two workshops were held. Workshop 1 was largely aimed to bring together industry isolation experts and familiarise the expert team with the concept of ISOLgate – through a guided tour of the already established TYREgate. The aim of the 2nd ISOLgate Industry Workshop was to present the pilot ISOLgate and seek Industry isolation experts' feedback and input to review, fully develop and confirm common terminology (ISOLgate Taxonomy) and, ISOLgate design and functionality to enable publicly accessible, online, global Isolation Risk Management Portal that would meet the industry needs.

Unique '3 Click' Graphical Search

TYREgate and ISOLgate's main benefit is not only the collection of many accidents and incidents and their analysis by using the ICAM methodology, and its reporting ability, but rather a graphical interface allowing access to layers of information in 3 clicks:

'3 Click' method:

What are my major risk factors? *(Click 1)*
Where can I find the causes of these factors? *(Click 2)*
Why did these specific accidents occur? *(Click 3)*
How can I mitigate the risks at my own operation? *(ISOgate Checklists)*

Link to EMESRTgate - Earth Moving Equipment Safety and Round Table (EMESRT) Design Philosophies

While there are a number of documents available that provide sound advice on Isolation procedures, these may not provide the background on why, and for what reasons, in order of priority, certain actions are required. Also, this advice is often only aimed at the end user, eg the fitter, electrician, and may or may not address the true root and contributing causes such as issues with product design which lie outside the persons scope of influence.

ISOLgate has overcome this by directly linking to Earth Moving Equipment Safety and Round Table (EMERST) Design Philosophies through a common field in both databases – namely the EMERST Risk, thereby allowing equipment designers to go from the issue to the solution in a reliable way.

CONCLUSIONS

The authors firmly believe that ISOLgate and its ability to provide information and ongoing communication of its findings will assist in making the mining industry a safer place of work. ISOLgate delivers this through the adoption of recommendations by the industry, Original Equipment Manufacturers (OEMs), industry groups and mining companies' management.

The vision for TYREgate / ISOLgate is to be the model project towards the development of several other Causal Factors Databases in high risk areas including the Design Philosophy topic areas determined by the EMESRT (http://www.mirmgate.com/emesrt.asp) to assist the mining industry with decision making in the medium to longer term.

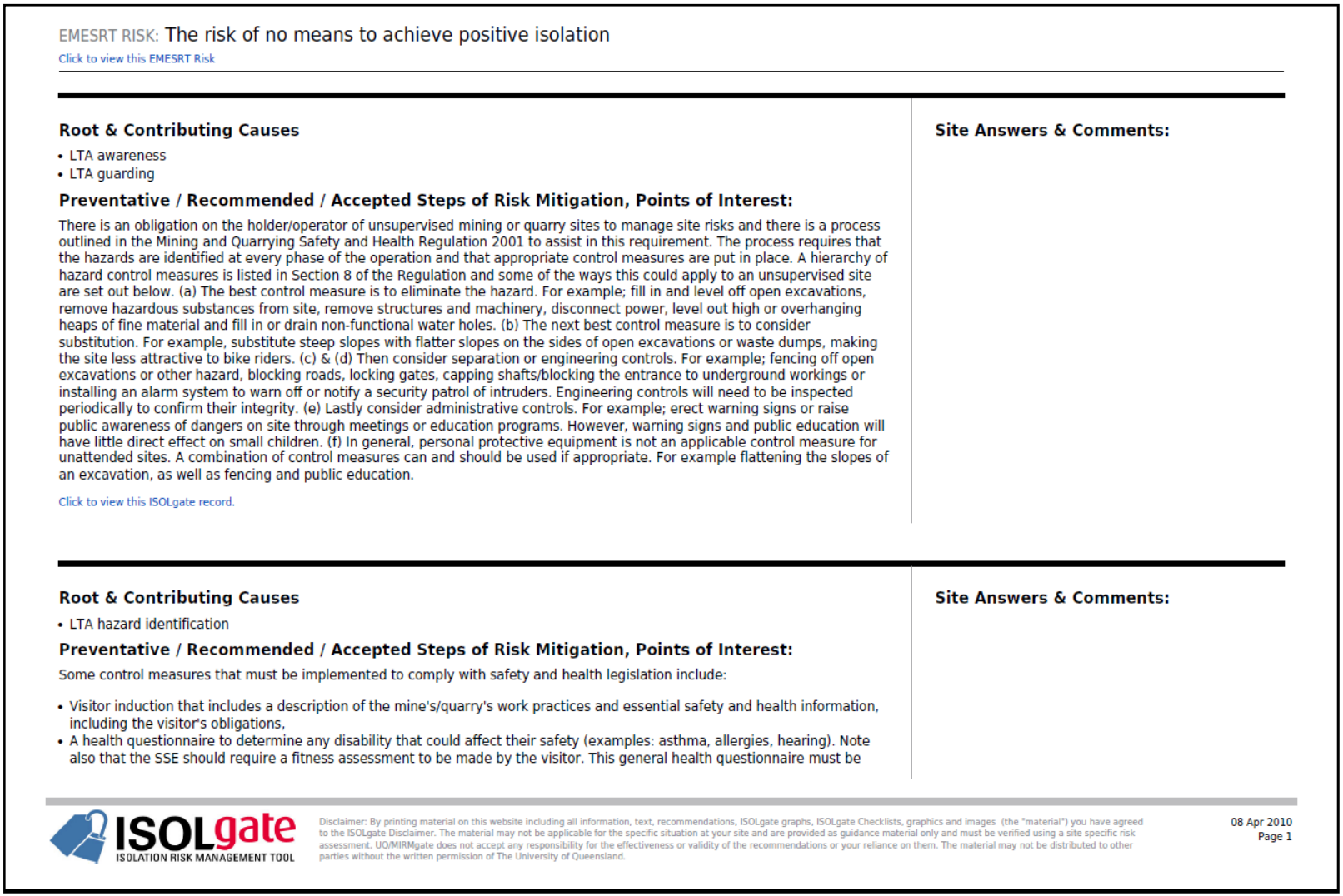
The TYREgate and ISOLgate research team has been awarded with new ACARP funding to establish **'COLLISIONgate – a Vehicle Interaction Causal Factors Database and Risk Management Decision Making Tool'** during 2010-2011. The COLLISIONgate will be the '3rd Gate' in the series of topic specific Gates development.

The development of TYREgate and ISOLgate has also led to a new ACARP funded **Phase One Study for a broader 'RISK'gate Resources System** that would provide priority hazard, event and control effectiveness analysis and risk controls for other critical mining hazards across a range of high risk areas.

Similar database approaches have already been adopted by other high risk industries such as the nuclear, aviation and the petrochemical sector, with considerable success. Unlike other high risk industries, the minerals industry currently does not have ready access to reliable incident, accident and risk control information to improve decisions made in OH&S. The 'Gates' will provide this 'missing link.

The authors would like to thank ACARP for providing funding to develop ISOLgate, our industry project monitors, Tony Egan and Jane Moss, for their continuing support and guidance, the ACARP project coordinator, Keith Smith, for his assistance and support, company representatives for their help with identifying company isolation experts and Health and Safety Specialists, and their support during the project's execution, the mining companies' isolation experts whom participated in Industry Consultation Workshop 1 & 2 for their invaluable input and feedback into the ISOLgate development process.

Figure 1. ISOLgate Home Page



EMESRT RISK: The risk of no means to achieve positive isolation

Click to view this EMESRT Risk

Root & Contributing Causes

- LTA awareness
- LTA guarding

Preventative / Recommended / Accepted Steps of Risk Mitigation, Points of Interest:

There is an obligation on the holder/operator of unsupervised mining or quarry sites to manage site risks and there is a process outlined in the Mining and Quarrying Safety and Health Regulation 2001 to assist in this requirement. The process requires that the hazards are identified at every phase of the operation and that appropriate control measures are put in place. A hierarchy of hazard control measures is listed in Section 8 of the Regulation and some of the ways this could apply to an unsupervised site are set out below. (a) The best control measure is to eliminate the hazard. For example; fill in and level off open excavations, remove hazardous substances from site, remove structures and machinery, disconnect power, level out high or overhanging heaps of fine material and fill in or drain non-functional water holes. (b) The next best control measure is to consider substitution. For example, substitute steep slopes with flatter slopes on the sides of open excavations or waste dumps, making the site less attractive to bike riders. (c) & (d) Then consider separation or engineering controls. For example; fencing off open excavations or other hazard, blocking roads, locking gates, capping shafts/blocking the entrance to underground workings or installing an alarm system to warn off or notify a security patrol of intruders. Engineering controls will need to be inspected periodically to confirm their integrity. (e) Lastly consider administrative controls. For example; erect warning signs or raise public awareness of dangers on site through meetings or education programs. However, warning signs and public education will have little direct effect on small children. (f) In general, personal protective equipment is not an applicable control measure for unattended sites. A combination of control measures can and should be used if appropriate. For example flattening the slopes of an excavation, as well as fencing and public education.

Click to view this ISOLgate record.

Site Answers & Comments:

Root & Contributing Causes

- LTA hazard identification

Preventative / Recommended / Accepted Steps of Risk Mitigation, Points of Interest:

Some control measures that must be implemented to comply with safety and health legislation include:

- Visitor induction that includes a description of the mine's/quarry's work practices and essential safety and health information, including the visitor's obligations,
- A health questionnaire to determine any disability that could affect their safety (examples: asthma, allergies, hearing). Note also that the SSE should require a fitness assessment to be made by the visitor. This general health questionnaire must be

Site Answers & Comments:

Figure 2. ISOLgate Checklist example