

# ACARP MATTERS

## RESEARCH EXCELLENCE AWARDS 2007

The value of safety and health research to the Australian coal industry was acknowledged on Thursday, 15th November with five safety and health projects winning the 2007 ACARP Research Excellence Awards.

At Augustine's in Brisbane, ACARP Board Member, Julie Beeby presented awards to:

- Patrick Glynn, CSIRO Exploration & Mining
- Jim Joy, Gul Kizil and Sue Leveritt, Sustainable Minerals Institute
- Tony Egan, Xstrata Coal
- Robin Burgess-Limerick, Burgess-Limerick & Associates
- Ray Davis, SIMTARS
- Larelle Fabbro, Central Queensland University.

On behalf of his co-chairman, Jon Davis, Rio Tinto and the ACARP Research Committee, Bruce Robertson, Anglo Coal detailed the achievement of the award winners.

Bruce said the outcomes of these safety and health research projects had wide ranging impacts across the Australian coal industry and illustrated ACARP's role in fostering innovation and a sustainable future for the industry.

"These awards, selected by ACARP's technical committees on a biennial basis, are targeted to projects that are unique, truly benefit the industry and are led by diligent achievers focused on practical outcomes," he said.

"This year's winners have achieved remarkable success within the science and social science disciplines."

## VEHICLE COLLISIONS ON MINE SITES CONTINUE TO OCCUR.

**ACARP Funding:** \$657,280 over 7 years

**Researcher:** Patrick Glynn - CSIRO Exploration & Mining

**Supporting Mines:** Blackwater

Operators of large mining trucks will soon be able to monitor the approach of light vehicles using a radar warning system which is in the commercialisation phase.

This innovative system has overcome the numerous blind spots for truck operators and can handle data from the 13 doppler radar antennae in real time. The radars are to be linked to the existing truck-mounted video cameras, which will clearly show operators what triggered the alarm. The system can be set to only provide a warning when a light vehicle is detected entering the safe braking distance of the haul truck.

While there are now commercial Radio Frequency Identification (RFID) systems that can be used to track and locate mobile equipment, they are not failsafe and radar is

seen as the technology of the future. Caterpillar now offers a radar warning system for its new trucks. However the CSIRO system is seen to be well in advance on what truck manufacturers have on offer.

CSIRO Exploration & Mining researcher Patrick Glynn has worked with a number of coal producers in trialling the radar warning system. The key breakthroughs he achieved include developing a technique that can effectively filter large quantities of data in real time and linking the radar to the onboard cameras.

"Patrick has shown persistence, excellence and an understanding of the practical needs of a hard working industry," Bruce Robertson said.



ACARP Award Recipients with Research Committee Chairmen.

IN THE EVENT OF A MINE EMERGENCY, SELF RESCUE NECESSITATES THE AVAILABILITY OF A SUITABLE VEHICLE CLOSE TO THE WORKING FACE THAT CAN SEE THROUGH THE SMOKE AND DUST, PROVIDE OXYGEN AND AID IN THEIR ESCAPE.

**ACARP Funding:** \$831,270 over 5 years

**Researcher:** Ray Davis, SIMTARS

**Supporting Mines:** Crinum & Awaba

The miners who escaped the Moura Number 2 explosion in Queensland in 1994 did so because they had access to a mine vehicle. It is likely that the vehicle was not approved for use in the environment the miners found themselves post-explosion. Simtars Principal Engineer Ray Davis and his team have worked hard to develop an approved package of equipment that can be retrofitted to existing mine vehicles to provide a safe means of escape.

Bruce Robertson said the exciting and innovative part of this research had been trialling a flameproof diesel vehicle in elevated methane environments to determine the real, rather than perceived, impact of running a diesel in an explosive atmosphere.

"The research has shown that a flameproof personnel transport vehicle can be safely operated in an explosive atmosphere while still maintaining complete control of the vehicle," he said.

"Hard work and diligence is helping the team to commercialise an effective safety package, thereby solving a real industry concern."

BLUE-GREEN ALGAL BLOOMS CAN PRODUCE TOXINS THAT HAVE SERIOUS HEALTH IMPLICATIONS IF INGESTED OR INHALED. THESE BLOOMS OR THE TOXINS PRODUCED OCCUR ON BOWEN BASIN MINE SITES.

**ACARP Funding:** \$190,300

**Researcher:** Larelle Fabbro - Central Queensland University

**Supporting Mines:** Norwich Park, Peak Downs, Saraji, Hay Point. Also work at German Creek, South Walker, Kestrel Coal, Hail Creek and Moura.

Methodologies for managing blue-green algae blooms in an industrial environment have been produced from Larelle Fabbro's research project.

Most global research in this area has focused on drinking water. This team has investigated the occurrence and consequence of blooms in water on coal mine sites.

Larelle's expertise has been recognised by the World Health Organisation, which has invited her to contribute to the literature on occupational exposures to toxic cyanobacteria (blue-green algae). Her site work has focused on what can be done to eliminate the conditions required for these toxins to develop in mine water and to translate the scientific data into human health risks and management options.

Bruce Robertson said the recent introduction of floating plants at Norwich Park mine in Queensland that drew molybdenum from the water represented a major step forward in reducing the risk of a toxic bloom developing on mine water storage.

"Hard work and a strong focus on the problem at hand has led to success and will soon produce a quick test for the recognition of the problem before it becomes dangerous," he said.

"This is a health project with likely international consequences."

Larelle has recently started ACARP project C16033 *Improved Morphometric and Genetic Tools for the Better Identification and Management of Blue-green Algae*. ACARP is providing funding of \$308,320 for this important work.



## EQUIPMENT DESIGN FAILINGS CAUSE ACCIDENTS ON MOBILE MINING EQUIPMENT.

**ACARP Funding:** \$153,600

**Researcher:** Jim Joy, Gul Kizil, Sue Leveritt – Sustainable Minerals Institute and Tony Egan, Xstrata Coal

**Supporting Mines:** Anglo Coal, Xstrata, Rio Tinto, BMA, Phelps Dodge, Newmont

The collaboration of six major mining companies around design problems with large mining equipment has resulted in equipment manufacturers being presented with a list of common problems and risks such as machine access that need to be addressed.

Most mining trucks arrive at their Australian dealers to be retrofitted with additional equipment specified by the purchasing mining company. Each retrofit is different even within the same company.

Bruce Robertson said the industry had informed equipment manufacturers that simply adhering to the standard was

not an excuse for not resolving the risks at the design and manufacturing stage.

“Jim and his team have shown great strength and competence in bringing this senior industry technical group together with a common desire to reduce the risk associated with operating mobile mining equipment. His leadership and facilitation has been a key to the success of the program,” he said.

Tony Egan helped pull together the all important industry participation, championing the project during the formative stages.

This project is a terrific example of the advantage and power of industry collaboration and has led to the establishment of the Earth Moving Equipment Safety Round Table.

The Sustainable Minerals Institute is about to become fully self-funded.

## THERE CONTINUES TO BE A LARGE NUMBER OF INJURIES ASSOCIATED WITH OPERATING UNDERGROUND MINING EQUIPMENT.

**ACARP Funding:** \$234,000

**Researcher:** Robin Burgess-Limerick - Burgess-Limerick & Associates

**Supporting Mines:** Fourteen underground operations in NSW and Qld

Shortfalls inherent in the ergonomic design of underground mining equipment have been shared across the coal industry and with manufacturers as a result of Robin Burgess-Limerick's research.

This project stemmed from an evaluation in 2005 of injury data from Xstrata Coal NSW underground operations. This investigation highlighted the prevalence of injuries associated with development equipment, particularly continuous miners shuttle cars, load haul dump vehicles, and personnel transport. As a result of this research, Xstrata NSW has adopted a number of redesign initiatives.

The project involved a systematic identification of the hazards associated with underground equipment and a collation of controls currently in place at 14 mines. This process was supported by an analysis of injury data held by Coal Services, and visits to other sites, manufacturers,

government agencies and international research organisations to identify potential controls for outstanding injury risks. In this phase of the work, the researcher spent six months at the National Institute for Occupational Safety and Health NIOSH, US, as a National Academy of Sciences Senior Research Associate.

Bruce Robertson said in addition to presentations at industry conferences, and publications in scientific journals, the results of the project were disseminated through a one-day seminar attended by 100 representatives from mines and manufacturers.

“A central component of the project was the development of a generic tool, and associated training materials, to assist mines in systematically assessing and controlling the injury risks associated with underground equipment,” he said.

“Robin has helped the Australian coal industry get onto the front foot and make the changes that were needed rather than awaiting the OEMs. Within this project he has worked hard to get the message across. The publications and courses that flow from his work are exemplarily.”

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