ACARP MATTERS

2009 ACARP Research Excellence Award Recipients

Rob Neale said that ACARP provided a unique environment for the coal industry to come together to solve problems.

"It is not about research for research's sake; it is about finding scientific excellence – defining the problem and solving it," he said.

"These awards are very significant in that they serve to highlight the excellent work that is done throughout the whole program. Tonight there will be six awards that highlight different aspects of this excellence."

Research into subsidence impact forecasts; a smart, wireless condition monitoring system; predicting blast overpressure enhancement conditions; and fugitive emission estimates in open cut mines were recognised; in addition to individual professional contributions to the industry.

ACARP

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2009 ACARP RESEARCH EXCELLENCE AWARDS

The strength and diversity of Australian coal research was highlighted at the 2009 ACARP Research Excellence Awards which were presented at an official ceremony at Augustine's restaurant, Brisbane, in November.

ACR Board Chairman, Rob Neale (New Hope Coal) and Research Committee Co-Chairman, Bruce Robertson (Anglo Coal) presented awards to:
- **Arthur Waddington and Don Kay, Mine Subsidence Engineering Consultants;**
- **Mingfei Luo, Vipac;**
- **Alan Richards, Terrock; Nigel Holmes, Homes Air Sciences; and Bruce Foster, Rio Tinto;**
- **Abouna Saghafi, CSIRO Energy Technology;**
- **Bruce Firth, CSIRO Energy Technology; and**
- **Bruce Robertson, Anglo Coal.**

TAKING THE GUESS WORK OUT OF MINE SUBSIDENCE PREDICTIONS
Researchers: Arthur Waddington and Don Kay, Mine Subsidence Engineering Consultants
ACARP Funding: $125,000
Commenced: April 2003
Completed: March 2009

The Australian coal industry is now able to develop mining subsidence impact models that indicate the probability of particular levels of damage occurring based on the known features of the building structures and predicted mine subsidence parameters.

The development of a comprehensive subsidence impact database, which contains records of subsidence to 1752 building structures in the Southern and Newcastle coalfields of New South Wales, has enabled researchers to develop objective criteria to assess subsidence impacts on domestic dwellings. Through this work researchers recognised that the methods of subsidence impact assessment used in the past, which were based upon the NCB methods from the UK, were imprecise and overly conservative.

Industry Monitor and BHP Billiton Illawarra Coal Manager Environment Gary Brassington said this new prediction methodology was a great improvement on traditional methodologies and would quickly be seen as the industry standard and methodology of choice when undertaking detailed assessments of mining proposals in populated areas.

Bruce Robertson said: "the team's attention to detail and professional approach has earned them well deserved respect, and has helped a number of operations access additional blocks of coal which, if denied, may have led to mine closure."

NEW CM SYSTEM REDUCES UNSCHEDULED MAINTENANCE
Researcher: Mingfei Luo, Vipac
Funding: $143,800
Commenced: October 2006
Completed: August 2008

A smart wireless condition monitoring system trialled at Xstrata Coal's Ravensworth Operations in New South Wales will reduce unscheduled maintenance and significantly reduce maintenance costs. This system for variable speed machinery extends condition-based maintenance of constant speed rotating machines, such as dangerous mechanical systems and chemical processes, and those in inaccessible areas and areas where wiring is problematic.

This cheap system will replace existing offline and online condition monitoring systems. Field testing on Dragline 1570 at Ravensworth Operations in May and June 2008 proved that the smart sensor system was working properly. Industry Monitor and Xstrata Coal Manager of Engineering System and Support Tony Egan said the engineers at Ravensworth had been having difficulty understanding a potential vibration problem with a large, variable speed dragline gearbox. "They found the system very helpful in understanding the problem due to its ease of installation, exception-based reporting and the ease of remotely

comparing like gearboxes online," he said.

Bruce Robertson presented the award to Mingfei Luo for scientific and technical excellence. "Mingfei's project exemplifies how a professional scientist can drive an innovation from a good idea to a real answer to the problem of determining the health of remote equipment," he said.

USING STATE-OF-THE-ART TECHNOLOGY TO PREDICT OVERPRESSURE CONDITIONS
Researchers: Alan Richards, Terrock; Nigel Holmes, Holmes Air Sciences; Bruce Foster, Rio Tinto
Funding: $282,000
Commenced: January 2006
Completed: April 2009

An advanced atmospheric modelling system is helping blasting engineers in the Hunter Valley to reasonably predict blast overpressure enhancement conditions and avoid blasting at times when breaches of overpressure limits are likely to occur.

Blast overpressure is an air pressure wave created by blasting. It is the source of the audible blasting noise and can cause windows to rattle. To minimise community disturbance, regulatory limits must be observed for blast overpressure at private residences. At times atmospheric conditions can enhance blast overpressure and cause unexpectedly high overpressure readings, sometimes resulting in a breach of overpressure limits. Until recently, prediction of overpressure enhancement has been extremely difficult and quite inaccurate.

In response to the need to more reliably predict blast overpressure in the Hunter Valley, the local open cut mines formed a joint venture to construct and manage a meteorological monitoring facility that detects conditions that will cause overpressure enhancement. The joint venture also provides the infrastructure support required to run the model to facilitate prediction of overpressure enhancement.

Coal & Allied HSE Process Improvement Bruce Foster said the MM5 modelling and the SODAR/RASS facility provided Hunter Valley miners with the necessary tools to achieve world's best practice in prediction of blast overpressure enhancement. "Advances like these help ensure the ongoing coexistence of mining and rural communities," he said.
In presenting the award for technical excellence and collaboration to Alan Richards, Nigel Holmes and Bruce Foster, Bruce Robertson said: "This is a perfect example of where collaboration across the coal industry is both essential and beneficial."

IMPROVING FUGITIVE EMISSION ESTIMATES IN OPEN CUT COAL MINES
Researchers: Abouna Saghafi, CSIRO Energy Technology
Funding: $268,000
Commenced: May 2006
Completed: June 2008

Estimating fugitive seam gas emissions from open cut coal mines has become much easier thanks to the development of an improved modelling methodology which has been accepted by the Federal Department of Climate Change in its National Greenhouse and Energy Report (Measurement) Technical Guidelines 2008.

A conceptual model for fugitive greenhouse gas emission estimation that approached Tier 3 levels of accuracy was developed in a previous ACARP project. The model was evaluated at mines between 2006 and 2008, enabling researchers to produce:
- A working model of seam gas emissions from open cut mines;
- An approach to planning the borehole drilling program by partitioning the mine lease into a limited number of gas zones where the coal seams and strata layout and the hydrology suggest similar gas behaviour; and
- An approach to gas content measurement of borehole core samples that measures the mix of carbon dioxide and methane.

Bruce said Abouna had responded brilliantly to the changing needs of industry and the community as he developed the science around the quantification of fugitive emissions. "He has excelled in a new and difficult area and produced a work of practical value to all," he said.

BRUCE FIRTH

CSIRO Energy Technology Research Group Manager Bruce Firth was presented with an excellence award for his contribution to the field of coal preparation.

ACR Board Chairman, Rob Neale, said Bruce had always adopted a professional and considered approach to the science around coal processing but, more than this, he was passionate about finding answers.

"The key to much of his scientific success has been the effort he has invested internally to ensure coal remains on the CSIRO hot list (if you will pardon the pun). CSIRO continues to contribute significant internal funding into the leading edge science being undertaken by Bruce and his team," he said.

"His energy and persistence have ensured the coal industry continues to enjoy substantial CSIRO co-contributions and real success."

Bruce obtained his PhD from Sydney University in 1975 and has worked in research and development in mineral and coal processing at Imperial College, BHP and BP. He joined CSIRO in 1991. He was the previous chairman of the Australian Coal Preparation Society.

BRUCE ROBERTSON

Anglo Coal, Regional Manager, Underground Technical Services, Bruce Robertson was presented with an excellence award for his leadership and guidance to ACARP.

Rob Neale said Bruce had been instrumental to the establishment, growth and professional development of ACARP.

"In life there are those who make it happen, those who watch it happen, and those who wonder what happened. Bruce Robertson is definitely one of those who make it happen," he said.

"Bruce laid out the original ACARP process in 1992 when the industry resumed the program from the Federal Government, and he has continued to provide great vision and leadership over the past 18 years.

"Well done Bruce! Your long-term involvement and understanding of the technical challenges of coal mining have helped make ACARP the excellent program it is today."