

ACARP MATTERS

DRAGLINE PRODUCTIVITY IMPROVEMENTS CONTINUE TO IMPROVE MINING COMPANY BOTTOM LINES

The Australian coal mining industry has gained at least a 10% improvement in dragline productivity since “bottom line” research and development, initiated with the assistance of ACARP, commenced in the 1990s.

This equates to a value of around \$2 million per dragline per year or \$150 million a year for the Australian coal mining industry as a whole, and at least one dragline in Australia has improved by 100%.

At the forefront of this commercially-focused research is Graham Lumley, who recognised the value of expanding on earlier research which focused on physical modelling and targeting it at a new commercial level. Graham says while the introduction of Tritronics dragline monitors in the late 1980s revolutionised the ability to collect data on dragline performance, it took some years for the data's value to be fully appreciated. His desire to further explore the data led to the first ACARP-sponsored dragline productivity project.

Since his initial ACARP-sponsored dragline productivity project in 1994, Graham has built a business - Ground Breaking Innovations (GBI) - which works with coal mining groups on ways to achieve optimum productivity with their large equipment. He has also led another four ACARP dragline and shovel productivity projects.

“The old adage of ‘how can you improve something if you can't measure it’ sums up the case for utilising data in productivity (or capacity utilisation) research,” he said.

The original project compared data from Australia's first 14 Tritronics dragline monitors and demonstrated that there was tremendous potential for its use.

“We found that there was a great deal of variability between different draglines' performance and most notably that there was a major opportunity for improvement in dragline buckets and rigging,” he said.

This led to further ACARP projects which explored various aspects of dragline buckets and rigging; and subsequently shovel dippers.

Graham said that while there was some initial resistance from mining companies regarding the value of data in general, most coal companies now conducted regular benchmarking of their draglines, shovels, excavators, front end loaders, trucks and drills.



Managing Director Ground Breaking Innovations Pty Ltd Graham Lumley (left) and Professor of Management, Department of Business, University of the Sunshine Coast Professor Andy Hede (right), inspect dragline operators' performance at the Meandu Coal Mine. GBI and USC collaborated on the ACARP-VTS project and are currently investigating reductions in operator performance over time.

Managing Director Ground Breaking Innovations Pty Ltd Graham Lumley (left) points out bucket performance characteristics of a new dragline bucket design at the Go4 Mining Pty Ltd test facility to Operations Manager Ground Breaking Innovations Pty Ltd Africa and South America Trevor Trott (right).



OPERATOR PERFORMANCE A FOCUS OF RECENT RESEARCH

This growing interest from mining companies has led to GBI taking its research to new levels. In 2005 Graham expanded his focus on the performance of dragline operators with another ACARP-sponsored project.

"Data was telling us that there were substantial differences between operators," he said. "Using the Vienna Test System of psychomotor testing, we have developed the means to make a prediction of an operator's dragline performance which is as good as any job performance prediction in any industry. It is now possible to predict, with a good degree of confidence, how good a person will be at operating a dragline before they ever touch the controls."

GBI is currently utilising these research findings to develop a best practice dragline operator recruitment and training process for use in the coal industry to ensure the right people are selected for the job and that they are trained effectively.

Another key finding of this latest ACARP project is that dragline operators lose productivity at an average rate of 0.75% per year of age. In many industries people get better with age. The project found the dragline operators lost about 0.35% of their gross motor skills per year of age, so it can be concluded that there is at least 0.4% per year of age being lost due to unknown reasons and possibly much more. Understanding and addressing these reasons is the focus of the latest ACARP project in which GBI is involved.

"We have a theory that motivation is a major factor so we are aiming to prove, or disprove, that the level of operator motivation relates to a performance over time," Graham said

THE INDUSTRY VIEW

Rio Tinto Coal Australia (RTCA) Manager Dragline Improvement Ben Metcalfe is a great supporter of ACARP's dragline productivity projects.

"Our Mount Thorley operations introduced scale bucket model testing in 1997 after ACARP pioneered the concept 12 years ago," he said. "In 2008 all RTCA sites have used scale bucket model testing as the best way to select optimum bucket shape and size for their particular spoil characteristics. Most recently all of the RTCA sites were part of the VTS programme. This VTS development has been piloted at Blair Athol Coal and will form a key lever in developing an operator proficiency programme for RTCA."

Graham says he has the highest regard for ACARP and its focus on funding coal mining industry-endorsed projects.

"ACARP has evolved into a really well run program of work. One of its advantages is that it attracts and supports some of the smartest minds to work on developing industry improvements," he said.

ACARP

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