



ACARP matters because it
incrementally improves DMC efficiency

In Australian coal preparation plants, around 80 per cent of the coal is processed through dense medium cyclones (DMCs). Incremental improvement in DMC efficiency can have enormous benefits across the industry and so ACARP has funded major projects towards this end.

Industry target

- Improve DMC efficiency
- Improve measuring and testing techniques in order to control and improve DMC performance
- Increase plant yield
- Reduce unplanned shutdowns.

Industry investment

- ACARP: \$5.153 million plus support from New Acland mine
- More than 29 projects.

Results

- Ongoing assessment of the DMC circuit operation at New Acland mine by CSIRO and JKMRC over more than five years. This unique collaborative approach between two leading research groups and a coal operator has enabled plant personnel to immediately determine how a DMC or pair of DMCs in a module is performing with a level of detail never achieved before.
- Evaluation of what is required to produce the next generation of coal preparation plant.
- An audio technique has been developed for detecting and monitoring the size of clay balls in DMCs. Clay balls occur with some specific clays and can cause significant downtime if not attended to before the balls grow large enough to block the cyclone nozzle. An operating technique of stopping the DMC feed on a time basis has been successfully employed but causes excessive production losses. The audio technique has solved this issue and is commercially available from CSIRO at ANSTO.
- Development of instruments and techniques for more accurate control of plant processes, including screen motion analysers, and EIS techniques to measure online medium specific gravity cyclone differentials (currently being commercialised by Ludowici Australia, now FLSmidth).
- Improvements to DMCs (different feed designs, optimising feed pressures, modelling).
- Production of a new DMC Handbook for Process Engineers which replaces the Dutch State Mines manual which was written in the 1950s when the largest DMCs were only 350 millimetres in diameter (they are now up to 1450 millimetres in diameter). This is one of a series of handbooks and best practice guidelines that ACARP has produced to lift beneficiation performance.
- ACARP's research is well ahead of existing coal preparation plant practice and a wealth of implementable research options are available and ready to be taken up by industry.



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Return on investment

- Insights into DMC operation which will lead to the near-term availability of a new generation plant that will be more efficient and reliable (longer operating hours) and require fewer operators
- Improved plant efficiency leading to increased yield
- Better instrumentation control and measuring, resulting in better auditing to improve efficiency
- Increase in usable coal / reduction in coal sent to reject
- Reduction in maintenance costs
- Reduction in unplanned plant downtime.