Inete Case Study:

Dragline International Relocation & Rebuild

The Project:

Inete was awarded the Engineers Australia Queensland Division 2007 Small Business Ventures / Projects award for its work carried out on this project.

The Dragline is a Marion 8200 which was procured by the client from West Virginia USA to be relocated to Blackwater Mine in Central Queensland. It is the second machine of this size to be introduced to the Blackwater mining pits. This is the second time this machine had been relocated. Originally moved once in the USA, it has for the second time been cut up and this time shipped across the Pacific Ocean to the port of Mackay for transport across the great dividing range to Blackwater mine site.

While the physical mechanical steel structure of the dragline was reused, electrically the machine has been completely redesigned and is all new. All aspects of the machine have been upgraded or enhanced including the MG-Sets, main DC Motors, PLC gear, SCADA and Power Control Room (PCR). The new electrical design replaced the older style hardwired relay logic to a fully automated and enunciated control system.

Inete was engaged directly to provide complete electrical project management. The electrical budget was AUD$20M of the overall project budget AUD$92M for the procurement, relocation and reassembly. The electrical project involved a total redesign of the dragline's entire on-board electrical and control systems employing state-of-the art technology, equipment, protections, communications, data acquisition and software control.

Project Overview

Project
Dragline Electrical Redesign, Relocation & Reassembly.

Location
Blackwater Mine near Blackwater in Central Queensland.

Infrastructure

- Three (3) x 3315 kW (4445 HP) Synchronous Motors;
- Seven (7) FE 824 M Hoist motors;
- Four (4) FE 824 M Drag Motors;
- Two (2) FE 824 M Propel Motors;
- Six (6) FE 820 M Swing Motors.

Project Scope
Complete electrical project management including:

- Scope of Works, tendering, assessment & awarding;
- Budgeting, cost control and forecasting;
- Scheduling of equipment procurement, delivery & reassembly;
- Managing procurement;
- Witness factory acceptance testing of major equipment;
- Develop & manage Commissioning Plan, complete with contingency, redundancy and test registry;
- Execute software and operational commissioning of machine on construction pad, complete boom raise and machine walk off;
- On-going technical support, in pit commissioning and tunning;
- Comprehensive machine hand over and continued technical support;
- Machine electrical supply: auxiliary electrical equipment—transportable substation 19 / 15 / 4 MVA 66 / 22 / 6.6 kV, 5 km of 70 mm^2 Type 450.22 trailing cable and 22 kV couplers.

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Dragline International Relocation & Electrical Redesign:

Dragline Off Cab Side Aerial Shot

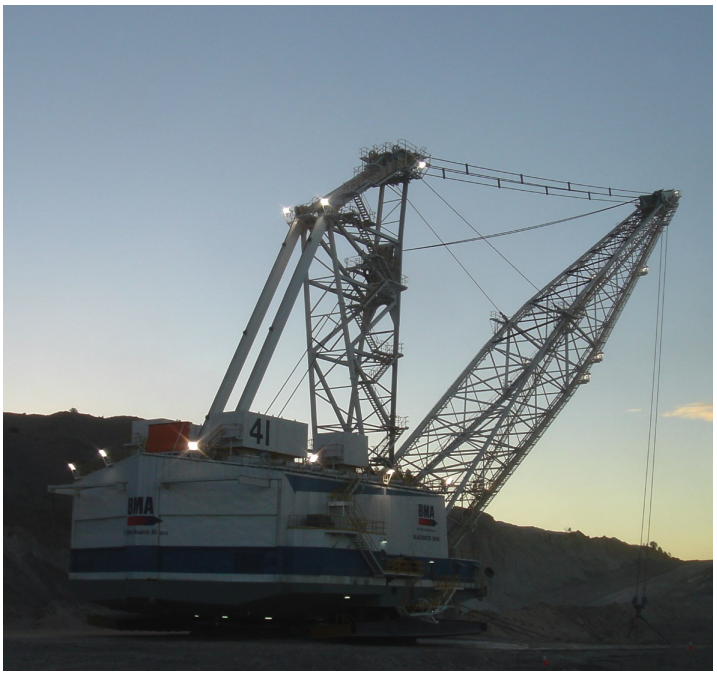
Dragline 41 Front Aerial Shot

Shutdown Works:

The engineering task was to completely design / redesign the on-board electrical distribution, AC-DC power delivery to the mechanical machinery, control systems, automation and provide SCADA on and off board. This was all to be compliant with Australian Standards and local Acts and Regulations governing such installations, while also readying the machine for any further future automation and expandability.

Inete's engagement with the client required us to act as the Principal's Representative. This role included the scoping of all electrical work on the machine, budgeting and cost control, tendering procurement, assessment and awarding, scheduling of procurement, inspecting and witness testing of major electrical manufactured equipment, resource management, manage electrical trade works of the reassembly of the machine, development and execute commissioning planning, contingency and control, manage the commissioning team, complete software design (PLC and SCADA) and development and associated bench testing. Then once commissioning was completed on the reassembly pad there was further commissioning and support undertaken in the process of walking the machine to the pit for digging. For several months the machine was monitored for operational refinements and fine tunning.

Inete was responsible for the compliance to Australia Standards, Queensland Coal Mining Act & Regulations and Blackwater Mine Regulations, this was made even more pronounced by the fact the original electrics were 60 Hz (USA) powered and controlled. Electrical safety on the machine, was at the fore front of the design, during reassembly and commissioning, all of which were the responsibility of Inete, and formed a key input to the acceptance of the machine to mine site operations and hand over.



Key design enhancements included a central programmable logic controller (PLC), the installation of more powerful DC motors and generators, comprehensive and configurable annunciation and data acquisition system, and an electrical distribution system designed to improve protection, performance, reduce costs and enhance safety.

Project Close Out:

Despite delays caused by the late delivery of the machine to Australia in March 2006 - due to the effects of Hurricane Katrina in the U.S.A - the electrical fit-out was completed on time and on budget in December 2006. Electrical staff were on-site for a further few months to assist in testing while the mechanical contract was being completed and to provide site support during the handover, training and initial operational tuning period.

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