



BHP BILLITON

Queensland Nickel (QNI)'s Yabulu Extension Project

Townsville, QLD

QNI's Yabulu Refinery is a laterite nickel and cobalt processing plant, and this extension of its metal refining section will process an intermediate nickel product (mixed hydroxide precipitate - MHP) from the Ravensthorpe integrated mine and primary processing facility in Western Australia. While the production process is essentially be the same as the current process, equipment based on latest technology and Smart instrumentation will be installed throughout.

Construction will take approximately two and a half years and involve up to 600 workers. The project increases Yabulu's competitiveness and more than doubles its production from 33,000 tons pa of nickel to nearly 78,000 tons pa, and 3,500 tons of cobalt. The engineering, procurement and construction management services required for the project is a joint venture between Hatch Associates and Multiplex Engineering and is known as the Yabulu Extension Project Joint Venture (YEPJV). Endress + Hauser Australia is the Main Instrument Vendor (MIV) for a project comprising over 3000 loops, with about 7000 I/O tags.



MANTA CONTROLS

Advanced SAG Mill Control at Gold Fields St Ives

Kambalda, WA

The Gold Fields St Ives mine in Western Australia deployed an advanced multi-variable control system to control the Lefroy mill's centrepiece - its 11m-diameter semi-autogenous grinding (SAG) mill. A key indicator of the success of this deployment is that the new control system runs continuously, using a unique process control algorithm called the 'Manta Cube'. An innovative alternative to the traditional expert system, it accurately monitors and responds to the dynamic

behaviour and multi-variable nature of the SAG mill and its associated processing circuit. The Manta Cube is made up of four distinct parts: 'the Cube', which determines the SAG mill operating mode; the Cube 'expert decision matrix', which determines what is required to return the SAG mill to the required operating band; the Cube 'engine', which handles the core multi-variable control and decoupling techniques; and the Cube 'optimiser', which optimises the key control objectives, such as SAG mill output. *This project is covered in detail on page 10.*



MULTISKILLED RESOURCES AUSTRALIA

Antienne Coal Unloader

Hunter Valley, NSW

WITH a capacity of 4000 tph over conveyors up to 5.5km long, the new unloader off the Main Northern Rail line supplies Macquarie Generation's Bayswater and Liddel Power stations, which together supply power to about 40 per cent of the State. Coal is automatically unloaded into a dump hopper fitted with vibrating feeders at the Antienne station off the Main Northern Rail Line, from where a 220m initial conveyor carries it up to the 5.5km main conveyor to the power stations. The high-speed integrated safety network - extending across a

site spanning 6.5km - incorporates compact safety PLC technology to achieve integrated global and local control. The safety system can respond with high speed and precision to site emergencies with a total site-wide shutdown of machinery, or provide an equally swift response to local issues arising on remote sections of the long-haul conveyors. This feature is vital both to protecting personnel and to minimising equipment damage in the event of a failure or hazard arising.



QUEENSLAND MAGNESIA

Retrofitting QMAG's drives

Rockhampton, QLD

Queensland Magnesia's (QMAG) Rockhampton plant had been experiencing poor electricity supply conditions in the form of frequent voltage fluctuations. Even a 2-second voltage dip would cause their air blowers, which are critical in the operation of the plant's gas-fired shaft kilns, to trip. If one of these blowers were to stop, the whole plant would shut down. An eight-hour restart procedure could follow, resulting in a considerable loss of production. It would happen whenever QMAG had a dip, ever since the plant was built, probably a couple of

times a month. QMAG decided to install new and replace existing variable speed drives on the shaft kiln air supply lines. Some of the drives were 14 and 15 years old. The replacement drives had to have good ride-through characteristics on voltage dips. The voltage dip ride-through feature on the drives allows the user's machinery to continue operating without tripping during supply dips and 'brown-outs' on one, two or all three phases. Since the installation, QMAG still get brown-outs that cause the lights to go out for two or three seconds, but the drives do not even slow down. For periods longer than that the drives begin to slow down gradually, but have never tripped again.

