

## Capability Statement 2007

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### Introduction

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Macquarie Engineers is a Newcastle based engineering consultancy, established in 1997, providing high-quality and customer-focused electrical, instrumentation and control engineering services to industry.

Macquarie Engineers specialise in the application of modern technology to new and existing industrial plants. Our experience ranges from extensive capital works to operational and maintenance support involving investigations and engineering to enhance existing plant operations, performance and reliability.

Our engineers have an average of more than 20 years experience in industrial electrical control. We are committed to understanding our customers' requirements and working with them to achieve project goals.

Macquarie Engineers is committed to safety and is proud to have had no lost time injuries in its 10 year history.

#### Principal Contacts:

Stuart Murdoch

Mobile: 0419 811 217

Email: [murdoch@maceng.com.au](mailto:murdoch@maceng.com.au)

Justin Ford

Mobile: 0419 811 227

Email: [ford@maceng.com.au](mailto:ford@maceng.com.au)

George Carraro

Mobile: 0419 811 287

Email: [carraro@maceng.com.au](mailto:carraro@maceng.com.au)

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Macquarie Engineers Pty Ltd

Unit 17 / 5-7 Channel Rd

Mayfield West NSW 2304

Postal:

P.O. Box 205

Mayfield NSW 2304

Phone: (02) 4967 6701

Fax: (02) 4967 6717

ABN: 92 078 996 773

Email: [mail@maceng.com.au](mailto:mail@maceng.com.au)

Web: [www.maceng.com.au](http://www.maceng.com.au)

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## Professional Services

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Professional services provided by Macquarie Engineers include:

- Project Management
- Conceptual design and feasibility studies
- Project definition and technical specifications
- Safety systems and statutory compliance
- Power distribution
- Switchboard & Motor Control Centre design
- PLC and SCADA system design and implementation
- Custom software development
- SQL database applications
- Instrumentation design
- Process control analysis and optimisation
- Down time outage minimisation strategies
- Commissioning services
- Data collection and monitoring.
- Fault finding, failure analysis & audit
- Research & Development

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## Industrial Applications

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Macquarie Engineers has extensive experience in a wide variety of industrial applications:

- Alarm systems
- Anti-collision
- Conveyor control
- Conveyor tension control
- Coal reclaimer automation
- Control room design
- Dragline bucket load monitoring
- Fume extraction/dedusting systems
- Furnace heating systems
- Hoist drives
- Large AC & DC motors and drives
- Pump & compressor control
- Rolling mills automation
- Roller tables
- Tracking systems
- Weighing systems
- Automated grinding machines
- Bar reelers & peelers
- Common bus drives
- Coal receipt & handling
- Coal stacker design
- Chemical plant instrumentation
- Drive speed precision control
- Fire systems monitoring
- Grain bulk handling and processing
- Hot metal shears & coilers
- Menu / schedule batching systems
- Positioning control
- Remote radio control
- Ship Loading
- Water treatment plants
- Wire drawing machines

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## Projects

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### Coal Reclaimers Electrical Upgrade 2004 - 2007

**Project Brief** This project covered the complete electrical rewire from the ground up, upgrade and automation of 4 coal reclaimers.

**Scope** Macquarie Engineers was involved in technical design, specifications, implementation and down-time minimisation planning, software development, on-site engineering, commissioning and post-implementation performance optimisation.

### Coal Reclaimers Rate Optimisation 2006 - 2007

**Project Brief** This project was aimed at optimising the reclaim rate of three coal reclaimers without major capital expenditure. The project scope involved investigation and analysis of existing shipping streams and reclaiming rates and methods to highlight areas of process control improvements.

**Scope** Macquarie Engineers was involved in software engineering, cost, implementation timing and benefits. Implementation was then undertaken with process control improvements targeted at reclaimer increased bin capacity utilisation, bin level loss reduction, reclaimer turn around time reduction, feeder control optimisation and shipping bins level monitoring improvements.

### Bar Processing Facility 2006-2007

**Project Brief** This project covered the semi-automation & safety upgrade of several bar processing machines.

**Scope** Macquarie Engineers was responsible for the design, installation specification, software development, and commissioning.

**Coal Terminal Water Management System 2006-2007**

**Project Brief** This project covered the PLC and SCADA upgrade of the water management facilities of a coal terminal. Facilities include coal stockpile spray pumps, water handling pumps and associated ponds, tanks and instrumentation.

**Scope** Macquarie Engineers was involved in the design, procurement, installation, software development and commissioning of the system.

**Diesel Engine Motor Starting Research And Development 2006-**

**Project Brief** This project covered the development of an diesel starting system to allow the removal of batteries as a power source

**Scope** Macquarie Engineers was involved in conceptual design, prototyping, testing and successful implementation of the system.

**Asphalt Plant Automation Upgrade 2005-2006**

**Project Brief** This project covered replacement of the existing SCADA and PLC with a recipe based solution and addition of a grinding plant.

**Scope** Macquarie Engineers was involved in all facets of the project including downtime minimisation strategies and the supply and installation of the new MCC / PLC cabinets as well as software engineering of the SCADA/PLC systems. The Company provided both on site and off site commissioning and provides remote dial-in support.

**RAAF Fuel Farm Upgrade 2005-2006**

**Project Brief** This project involved the upgrade of the fuel farm pumping, safety & instrumentation.

**Scope** Macquarie Engineers was sub-contracted to carry out PLC, Safety PLC, and SCADA equipment design, supply together with the associated software development & system testing.

**Ammonia Gas Weighing & Filling System 2006-2007**

**Project Brief** This project covered the implementation of an ammonia gas filling system designed to handle the supervised filling of more than 7000 ammonia gas cylinders.

**Scope** Macquarie Engineers was involved in the use of a SQL database, Visual Basic operator interface, PLC controlled system to test, log, retrieve and control the accurate filling of the cylinders.

**Coal Mine Open Cut Dragline Production Monitoring 2004-2006**

**Project Brief** This project covered a SCADA replacement and PLC software upgrade of dragline performance monitoring and in flight bucket weighing systems.

**Scope** Macquarie Engineers was involved in upgrade investigations, SCADA and PLC software development and implementation of dragline boom stress monitoring and bucket weighing system using hoist motor load torque and dragline three dimensional bucket positioning to determine accurate bucket weight loads up to 120T per bucket lift.

**Blast Furnace Reline - Charging System and Furnace Top Automation 2002-2004**

**Project Brief** This project covered the replacement and automation of the furnace top and associated electrical systems, as well as automation of the raw materials charging system during a blast furnace reline.

**Scope** Macquarie Engineers was involved in all electrical facets of the development and implementation of the furnace top automation and raw materials charging system.

Macquarie Engineers assisted in electrical estimating for the project prior to project authorisation, then carried out detailed design of charging system motor control centres and Charging PLC. It also developed the charging system functional description in close co-operation with the customer. Software implementation included the PLC automation software and configuration of control room graphics and PLC interface including system graphics, menus, recipes and reports. Macquarie Engineers had key involvement in the commissioning and ramp up phases of the plant.

**Fire Systems Remote Monitoring And Control 2002-2003**

**Project Brief** This project covered the use of Citect to provide operators with feedback of fire zone statuses across a large networked fire system.

**Scope** Macquarie Engineers was involved in the graphics development and software engineering.

**Conveyor Take-Up Winches Tension Control 2002-2003**

**Project Brief** This project covered the installation of four take-up winch automatic tension control systems on coal conveyors up to 2500m long.

**Scope** Macquarie Engineers was involved in design, specification, commissioning, software development, AC variable speed drive configuration and commissioning.

**Coal Wagon Unloading Automation 2001-2002**

**Project Brief** This project covered the conversion of around 1000 manual coal unloading wagons and 5 dump stations to electric automatic unloading.

**Scope** Macquarie Engineers was involved in investigations, option selection, wagon and dump station prototype trials, detailed design and final installation and commissioning.

**Wire Drawing, Galvanising and Wire Product Line 1998-2001**

**Project Brief** This project covered the implementation of wire drawing, galvanising and wire manufacturing production lines.

**Scope** Macquarie Engineers was involved in the implementation of the wire drawing facility. This involved the design, installation and commissioning over 100 AC and DC variable speed drives and the associated tension and spooling control.

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## Clients

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Some of our valued clients include:

- Advitech
- Bechtel
- Boral
- Department of Primary Industries
- Hunter Water
- Onesteel
- Pacific National
- Smorgon Steel
- Tomago Aluminium
- Worley Parsons
- Australian Customs Service
- BHP Billiton
- Delta Manganese
- Graincorp
- Indratel
- Orica
- Port Waratah Coal Services
- Stowe
- Sun Rice
- Xstrata