CDMS ELECTRICAL ENGINEERING
TRUSTED SPECIALISTS
FOR 20+ YEARS

COMPANY CAPABILITY STATEMENT

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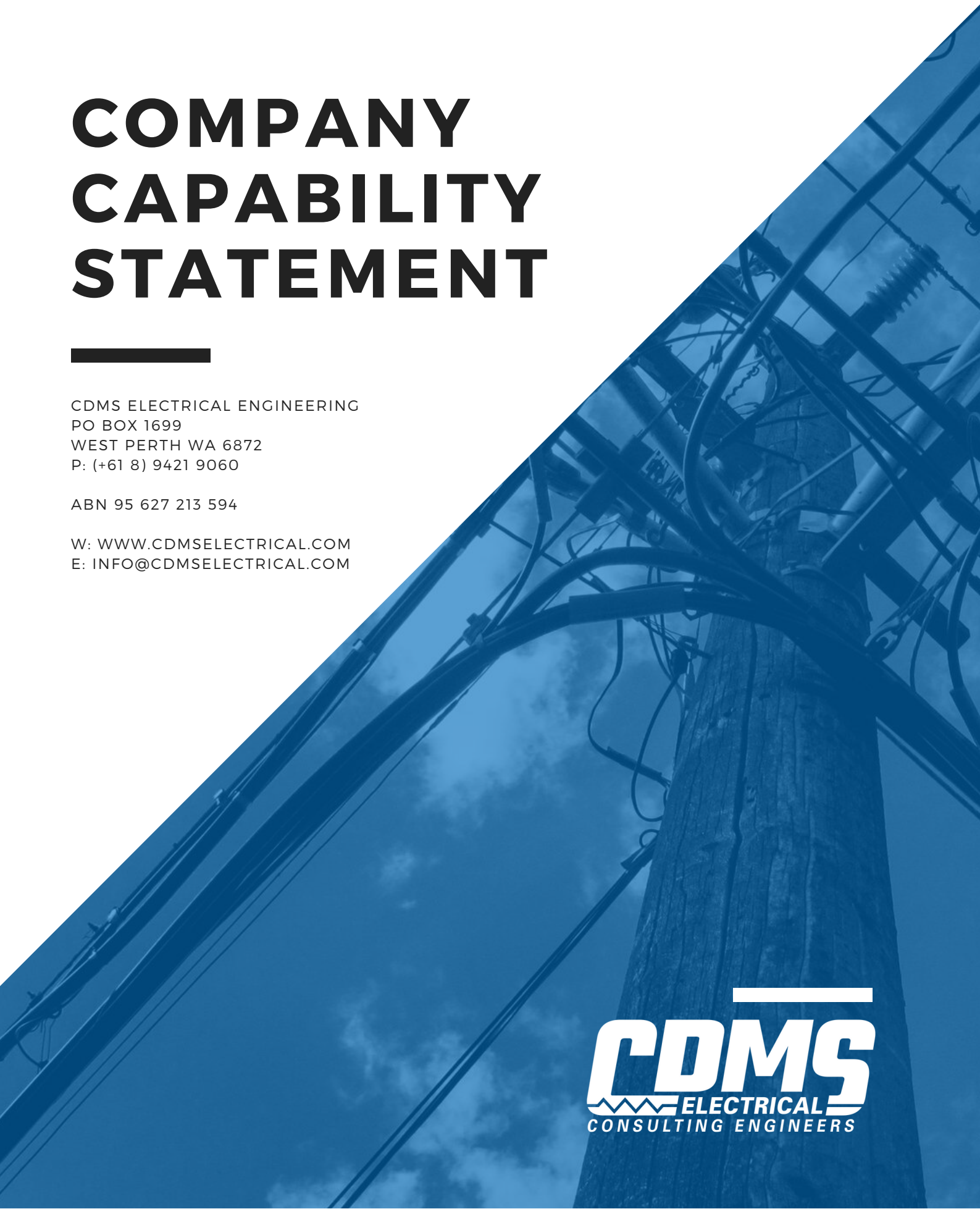
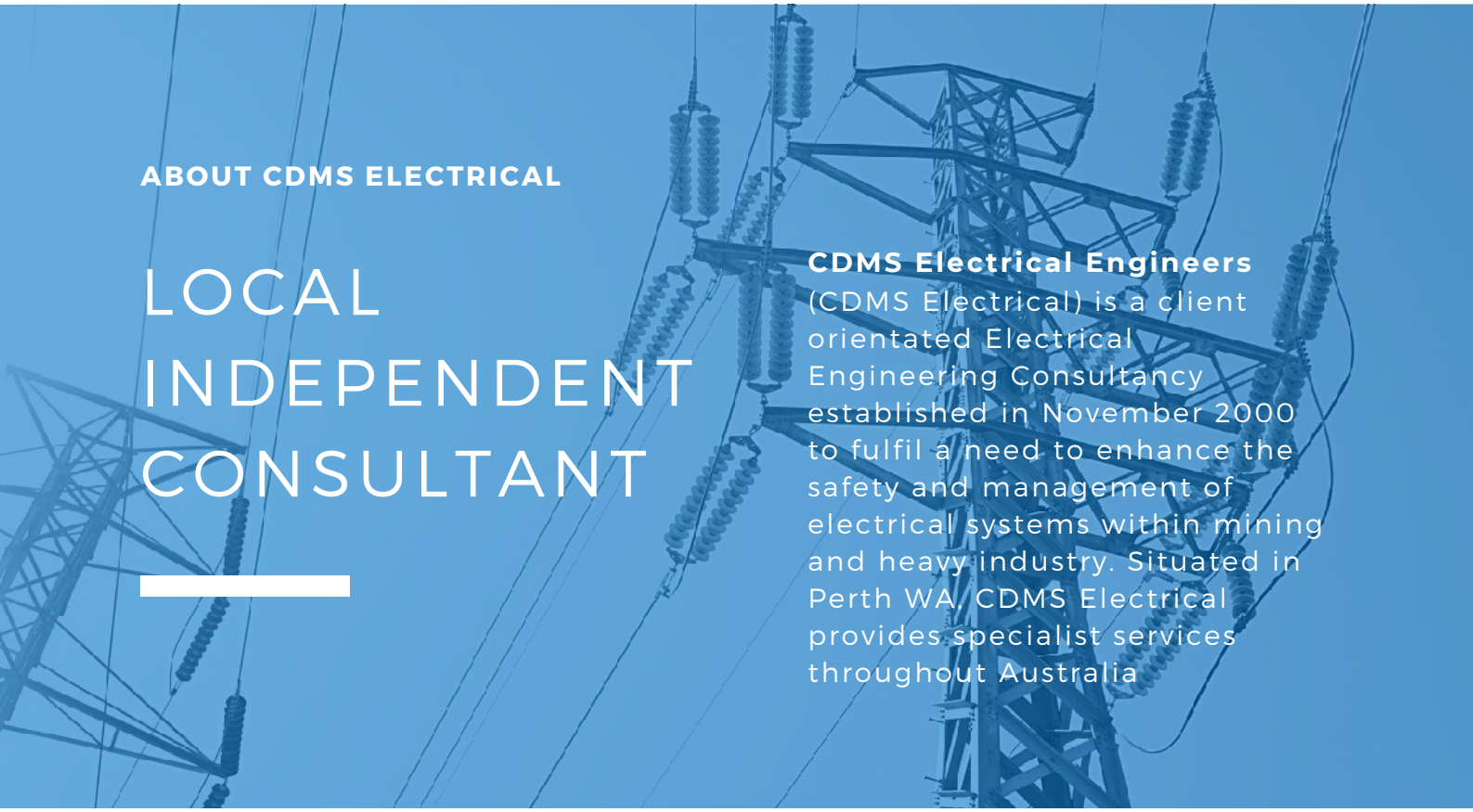


CDMS ELECTRICAL CONSULTING ENGINEERS



ABOUT CDMS ELECTRICAL

LOCAL INDEPENDENT CONSULTANT

CDMS Electrical Engineers (CDMS Electrical) is a client orientated Electrical Engineering Consultancy established in November 2000 to fulfil a need to enhance the safety and management of electrical systems within mining and heavy industry. Situated in Perth WA, CDMS Electrical provides specialist services throughout Australia

CDMS Electrical Engineers (previously known as "TCT Engineering") was established in Belmont, NSW in 2000 as a consulting firm to fulfil a need to enhance the safety and management of electrical systems within mining and heavy industries.

As the company developed it has become regarded as a leading power system engineering and design specialist with vast experience across a variety of fields. CDMS Electrical takes pride in the ability to successfully implement engineering projects that fulfil our clients' needs and compliance requirements. CDMS Electrical provides personal and professional services, and understands that our clients' success is our success.

CDMS Electrical will take a concept, and provide total design, safety, compliance and management for projects of all sizes, ensuring auditing, reporting, quality control, contract management and contract administration is provided from feasibility to final delivery. Our highly qualified and dedicated team take satisfaction in providing quality electrical engineering and project management services to our clients, adding value whilst maintaining a technical edge.

ABOUT CDMS ELECTRICAL

OUR SPECIALIST SERVICES

What differentiates CDMS from other firms is our unique combination of specialised services combined with a 20 year proven track record of delivering successful projects to our clients.

- POWER SYSTEM ENGINEERING AND DESIGN
- ELECTRICAL PROCEDURES COMPLIANCE
- POWER SYSTEM MODELLING
- ELECTRICAL AUDITS AND REVIEWS
- FUNCTIONAL SAFETY
- ELECTRICAL DESIGN
- ELECTRICAL PROJECT MANAGEMENT
- ELECTRICAL DRAFTING
- AUTOMATION AND CONTROL ENGINEERING
- OHS MANAGEMENT
- BUILDING SERVICES
- COMMISSIONING
- EARTH INJECTION TESTING

- CLIENT FOCUSED
- 20+ YEARS EXPERIENCE
- ENERGY & CONSTRUCTION SPECIALISTS
- CLIENT COLLABORATION
- 2,000+ JOBS COMPLETED
- LOCALLY OWNED & OPERATED
- INDEPENDENT
- EXCELLENT TRACK RECORD
- SERVICE & QUALITY FOCUSED
- GREAT TEAM & DRIVEN CULTURE
- QUICK QUOTE TURN AROUND

OUR CORE VALUES

RESPECT
Respect is a core value underlying all our relationships between work colleagues, our clients and key suppliers.

CUSTOMER FOCUS
We are dedicated to supporting our clients. We provide services that are of high quality, responsive and customer focused.

CONTINUOUS IMPROVEMENT
We aim to continuously improve our performance and always look for innovative solutions.

INTEGRITY
We commit to delivering solutions to our clients through service which is honest, reliable, trustworthy and accurate.

SAFETY, ENVIRONMENTAL & QUALITY
We prioritize safety in design and are environmentally aware to ensure that engineering solutions meet the requirements of all stakeholders.

COLLABORATION
We believe the best solutions come from working together with both colleagues and clients.

ABOUT CDMS ELECTRICAL

KEY ATTRIBUTES

Delivering quality engineering services since 2000.

Dynamic and innovative niche consultancy.

Dedicated team providing customised service.

Specialist in electrical, automation & control engineering services.

Unique solutions finder.

Continuous Improvement. Committed to advancement.

We work as a dedicated team and as a result, projects are planned, managed and completed in a timely, on-budget manner with few surprises. As a single point of contact for engineering deliverables, we offer total responsibility and efficiency in controlling costs at every phase.

Our CDMS Electrical Team's core experience has been built on the energy, construction, mining, heavy and light industries so with over 20 years of experience you can be assured that we understand your specific needs. Whether it be power generation, networking or system audits, we can look after the full scope of your electrical service needs.

SERVICES

AREAS OF EXPERTISE

What differentiates CDMS Electrical Engineering from other firms is our unique combination of services. By integrating the skills and experience of our engineering staff, our teams bring greater efficiencies and service know-how to all client projects.

Power Systems Engineering & Design

Electrical Procedures & Compliance

Power System Modelling

Electrical Audits & Reviews

Electrical Project Management

Electrical Drafting

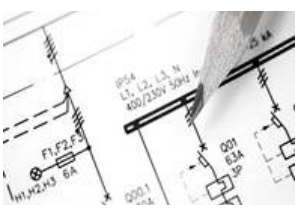
Automation & Control Engineering

OH&S Management Legislative

Compliance & Support

Building Services

Commissioning


Electrical Design

SERVICES

- PRESSURE EQUIPMENT DESIGN
- FUEL HANDLING & STORAGE
- TANKS, THICKENERS & CLARIFIERS
- STEEL STRUCTURAL DESIGN
- LIFTING DESIGN
- CIVIL DESIGN
- PRODUCT DEVELOPMENT
- SPECIALIST SERVICES
- PIPING & PUMPING
- BULK MATERIALS HANDLING
- MAINTENANCE
- MAJOR PROJECTS
- DESIGN, VERIFICATION & REGISTRATION
- SPECIALIST DESIGN
- ELECTRICAL & POWER
- INSTRUMENTATION & CONTROL SYSTEMS

CDMS ELECTRICAL CONSULTING ENGINEERS

SERVICES

POWER SYSTEM ENGINEERING

Including:

- High / low voltage systems
- Power reticulation
- Power systems modelling (arc flash fault level analysis, protection grading, load flow studies)
- Arc flash studies and mitigation
- Protection grading, settings and calibration, optimisation and fault operation analysis
- Variable Speed Drives (VVVF, VSD)
- Switchboards and motor control centres
- Switchboard and reticulation
- Earthing systems design (power and lightning)
- Earth grid and systems design and testing
- Lightning protection
- Earth grid touch potentials testing
- Metering and monitoring
- Power Factor Correction
- Functional safety, we are experienced and AS 61508, AS 62061, AS 4024. FS Eng (TÜV Rheinland)
- Solar integration and coordination
- Generator integration and coordination
- Power generation including synchronisation

EXAMPLE OF PREVIOUS WORK

Job Name: *Central Thermal Plant*
Client: *Frasers Property*
Location: *Sydney, NSW*
Type: *Electrical Design*

CDMS was approached to assist with the electrical design for the high voltage infrastructure of the Central Thermal Plant Stage 2 works. The objective of the project was to implement interface design for the diesel generator, in order to serve as a blackout generator for providing supply to essential equipment and synchronise back to mains on supply return. Moreover, CDMS used Power Tools for Windows to model the HV network and provide protection, load flow and arc flash analysis of the site.

SERVICES

ELECTRICAL PROCEDURES+ COMPLIANCE

Including:

- Occupational Health and Safety Management Systems
- Electrical Safety Management Systems (ESMS)
- Electrical Engineering Control Plan (EECP)
- Electrical training and assessment systems
- Contractor Management Systems
- Electrical procedures (electrical workers site access, live electrical testing, PLC procedures and control system procedures)
- General procedures (penetration permits, electrical hand tools and site access)
- Approval forms (PLC change forms and site access forms)
- Risk Assessments

EXAMPLE OF PREVIOUS WORK

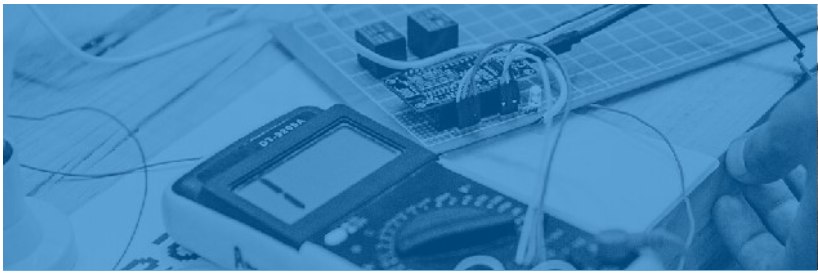
Job Name: *Hanson Quarry*
Client: *Hanson Heidelberg Cement Group*
Location: *NSW*
Type: *Compliance*

CDMS Electrical Engineers became the Electrical Engineers in charge for a number of Hanson Quarry Sites.

CDMS was approached by Hanson Heidelberg Cement Group to provide services such as compliance audits, design upgrades, ISMP development, implementation and training.

SERVICES

POWER SYSTEM MODELLING



Including:

- Load flow
- Fault levels
- Protection grading
- Arc flash
- Harmonics
- Flicker analysis

EXAMPLE OF PREVIOUS WORK

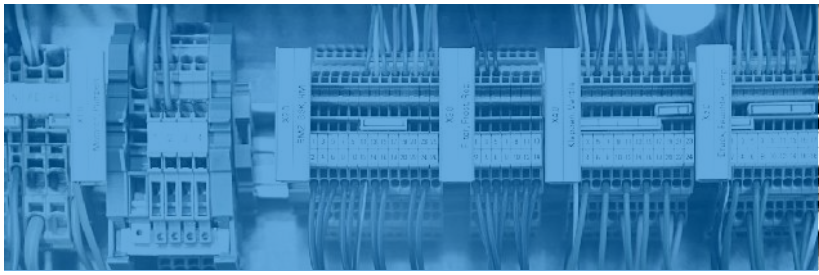
Job Name: *Arc Flash Management*
Client: *Gosford City Council*
Location: *NSW*
Type: *High Voltage Sites Arc Flash Management*

CDMS was engaged by Gosford City Council to review their management of Arc Flash Hazards at their electrical installation throughout the LGA. Arc Flash Management Studies were carried out for all high voltage sites and key 415V high energy installations.

The objective of the project was to conduct the necessary incident energy calculations to determine the best hierarchical controls to manage the risks. A management system including a practical approach to manage arc flash hazards along with a combination of controls with PPE was introduced. The project was successfully delivered by conducting arc flash studies based on IEEE 1584 and NF- PA70E ART 130 and providing a workable set of improvements to mitigate arc flash risk to acceptable levels.

SERVICES

ELECTRICAL AUDITS & REVIEWS



Including:

- Electrical safety management documentation and implementation
- High and low voltage audits
- AS 3000 wiring rules
- AS 3007 electrical installations for surface mines
- AS 1768 lightning protection
- AS 4024 guarding
- AS 1755 conveyor systems
- Functional safety audits
- NSW / QLD mining compliance documentation

EXAMPLE OF PREVIOUS WORK

Job Name: *Electrical Audits*
Client: *Confidential*
Location: *NSW*
Type: *Creating Reports based on electrical & Functional Safety Audits*

CDMS was approached by a number of clients to complete the electrical audits which covered:

- AS3000/AS3007 Electrical Audit Report
- HV Electrical Compliance Initiatives Report
- Functional Safety Audits

SERVICES

FUNCTIONAL SAFETY

Including:

- Determination of Safety Integrity Levels (SILs)
- Verification of safety related systems against the functional safety requirements/SILs
- Design of electrical safety-related systems
- Development of functional safety management plans
- Functional safety audits as per standards AS 61508, AS 62061 and AS IEC 61511

EXAMPLE OF PREVIOUS WORK

Job Name: *HMAS Stirling Fuel Farm*
Client: *Decmil*
Location: *WA*
Type: *Various*

CDMS Electrical Engineers was engaged to work on a large Australian Naval Refilling Base Tank and Pipe Replacement project.

The project objectives included replacement and installation of new pipe work and new tanks to replace the existing end-of-life infrastructure.

It also included functional safety audits against API 2350, static earthing, earthing of pipes and tanks, audit of control systems as well as relay logic modifications. CDMS worked with multiple disciplines and groups to complete the project. Challenges overcome included incomplete onsite electrical drawings and assessment of hazardous areas and their inclusion in the design.

SERVICES

ELECTRICAL PROJECT MANAGEMENT

Including:

- Project definition creation
- Project risk assessments
- Electrical feasibility studies
- Equipment schedule & CAPEX applications
- Control, planning, execution
- Engineering specifications
- Verification of specifications
- Reporting/cost control
- Commissioning & handover experience includes:
  - Inspection Test Plans (ITP's)
  - Commissioning programs
  - Process verification
  - Design criteria validation
  - Performance review
  - Handover

EXAMPLE OF PREVIOUS WORK

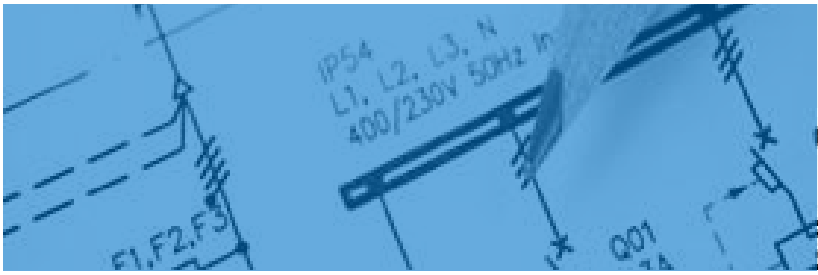
Job Name: *Batemans Bay Bridge Electrical Upgrade*
Client: *Roads & Maritime Service*
Location: *NSW*
Type: *Project Management*

CDMS and Kenshaw Electrical were engaged by the Roads and Maritime Service to upgrade the electrical and control systems on the Batemans Bay Bridge to achieve safe and reliable operation for road, pedestrian and water traffic.

CDMS project managed the Kenshaw Electrical Installation site works and the CDMS Control & Automation works, to ensure the project progressed to the construction time frames, as well as meeting all required safety, reporting and contractual requirements of the works.

SERVICES

ELECTRICAL DRAFTING



Including:

- Single Line Diagrams (SLD)
- Detailed electrical design
- Electrical schematics
- Protection schematics
- Interlocking schematics
- Cable schedules
- Layout drawings
- Termination diagrams
- Instrument loop diagrams
- Spreadsheets for I/O lists
- Tracing
- AutoCAD drawings
- Printing A4 to A0

EXAMPLE OF PREVIOUS WORK

Job Name: *Main PLC*
Client: *Flyash Australia*
Location: *Eraring Power Station*
Type: *Electrical Design & Control Drawings*

CDMS was engaged by Flyash Australia to do electrical design and drafting for the upgrade of the Eraring site to replace the original installed 240V hard wired controls with 24VDC PLC Controls.

Electrical drawings were designed and drafted to allow the manufacture and supply of the main PLC panel as well as a remote DeviceNet control panel. Drawings included full control schematics, termination drawings, cable schedules and panel layouts.

SERVICES

AUTOMATION & CONTROL ENGINEERING

Including:

- Design, optimisation, commissioning and call out support
- Functional specifications
- Programmable Logic Controllers (PLC's)
- SCADA Systems, including server setup
- Telemetry
- Instrumentation
- Networking
- Industrial programming

EXAMPLE OF PREVIOUS WORK

Job Name: *Swansea Bridge*
Client: *Roads & Maritime Service*
Location: *NSW*
Type: *Automation Upgrade*

CDMS was engaged by the Roads and Maritime Service to upgrade their existing automation systems for safe and reliable operation of the Swansea Bridge.

The objective of the project was to simplify the operator desk layout and automation interlocking to avoid ongoing traffic incidents and delays.

A SCADA system was added to monitor operations. CDMS held discussions with the operators and completed detailed desktop acceptance testing and commissioning to ensure a smooth upgrade process.

The challenges faced included investigating existing automation systems and delivering a workable automation and operator interface system without compromising the ongoing operation of the bridge.

SERVICES

OH&S MANAGEMENT

Including:

- Occupational Health and Safety Management System
- Electrical Safety Management System
- Contractor Management Systems
- Compliance audits and system reviews
- Training assessment

EXAMPLE OF PREVIOUS WORK

Job Name: *Site Compliance Audit*
Client: *Hebden Quarry*
Location: *NSW*
Type: *Compliance Audit*

CDMS was engaged to carry out a quarry compliance audit to Australian Standards AS3000 and AS3007. This included the office, weighbridge, amenities, workshop and mining areas including portable mining equipment.

The objective of the project was to provide Hebden Quarries with a detailed report of the findings including a list of practical recommendations. A maintenance management system was also provided for the site.

SERVICES

BUILDING SERVICES

Including:

- Negotiating with Supply Authority and creating power supply strategies
- General and special-purpose power
- Installing energy-efficient lighting systems and controls
- Setting up electrical, communications systems infrastructure and cabling design for consumer mains and submains
- Setting up master antennas and installing televisions
- Installing back-up systems, standby generators and uninterruptable power supply
- Renewable power system design (as well as integration with existing grids)
- Setting up communications systems and data systems
- Designing and installing Public Address (PA) systems and other audio-visual systems
- Main switchboard metering

EXAMPLE OF PREVIOUS WORK

Job Name: *Heavy Vehicle Workshop*
Client: *Whitehaven Coal*
Location: *Maules Creek*
Type: *Electrical Design*

CDMS was engaged by Whitehaven Coal to create the electrical design for the LV Power Distribution and lighting at the new HV Workshop building complex.

CDMS developed max demand load schedules for the installed equipment, cable sizing design (including... sizing and fault loop impedance calculations), conduit run design, cable schedules, lighting design, light and power layout drawings, single line drawings, distribution board design, and installation scope of works.

CDMS also provided sizing/capacity design for the 22kV/433V supply transformer and backup 415V generator, as well as design for the main switchboard.

SERVICES

COMMISSION-ING

Including:

- Onsite assistance with commissioning and testing
- Development of test sheets for electrical staff
- Earth injection testing
- Control system commissioning
- Fault finding
- Generator testing
- Assistance with witness testing protection

EXAMPLE OF PREVIOUS WORK

Job Name: *Heavy Vehicle Workshop*
Client: *Whitehaven Coal*
Location: *Rocglen Site*
Type: *Electrical Design*

CDMS was engaged by Whitehaven Coal to do the electrical design, programming and commissioning of a coal crushing and truck loading platform at the Rocglen site.

Commissioning was performed with the site electrical installer.

It included point to point checks, impedance and continuity checks, adjustments/settings of all devices (CB's, TOL, E/L, VSD's, pressure transmitters, level transmitters etc.), I/O checks to the PLC and drives, safety & protection device interlocking checks for each device, bump testing of motors, dry testing of each drive and drive sequencing, wet testing of all drives and sequencing, as well as ongoing adjustments and fine tuning of the plant after production start-up.

SERVICES

ELECTRICAL DESIGN

Including:

- High / Low Voltage Systems
- Variable Speed Drives (VVVF, VSD)
- PLC field wiring

EXAMPLE OF PREVIOUS WORK

Job Name: *Karuah Plant Upgrade*
Client: *Hunter Quarries*
Location: *NSW*
Type: *Electrical Design*

CDMS Electrical Engineers was engaged by Hunter Quarries to provide the electrical design to upgrade their crushing and screening plant at Karuah to produce a bigger range of weights and sizes in their blue metal rock products.

CDMS implemented a detailed engineering design by considering the current site electrical infrastructure; performing a detailed risk assessment; developing integration requirements for a new switchboard with basic functionality specifications; reviewing and adapting plant's control functionality; developing SCADA/PLC/HMI control and logic sequencing; providing documented configuration files and onsite control system commissioning. The challenges overcame included the scope change and new plant to have a control system similar to the existing plant to reduce operator error.

SERVICES

EARTH RESISTANCE & INJECTION TESTING

Including:

- Availability of the test gear and the technical expertise to test the earthing installation.
- Earth resistivity testing is used to measure the resistivity of the earth (soil) that an earth grid is to be installed (buried).
- Low level currents are injected into the ground replicating a real fault current (at a much lower level) and by measuring the effects, the results can be scaled to predict the actual voltage rise levels for the actual fault levels.
- It is very important at the design stage to have accurate information as this has a direct effect on the earth grid and its design. The combined earth grid resistance is calculated using the measured earth resistance and details of the bonded earth stakes and buried copper arrangement.
- Off frequency low current injection testing is used for design verification and to confirm compliance of touch / step potentials generated during fault conditions in power system.

EXAMPLE OF PREVIOUS WORK

Job Name: *WesTrac Tomago*
Client: *Stowe Australia*
Location: *NSW*
Type: *Generator Earthing System Design*

CDMS was engaged by Stowe Australia Pty Ltd to design an earth grid for two new back-up generators and an associated 415V / 11kV step up transformer.

The project consisted of resistivity measurements utilising the Wenner array method.

Using the results from this test, the combined HV and LV earthing system was designed along with a CAD drafted earthing layout and connection diagram.

On completion of the installation, CDMS conducted further injection testing to verify the design in accordance with the relevant standards.

SERVICES

EXAMPLES OF PREVIOUS PROJECTS

Job Name: *Werris Creek Coal Mine*
Client: *Whitehaven Coal*
Location: *NSW, Australia*
Type: *Crushing Plant/Truck Load-out*

CDMS was Whitehaven Coal Group's electrical engineering service provider of choice in developing their mine sites across NSW.

For the Werris Creek Coal Crushing Plant and truck load-out, CDMS provided a complete electrical package from the power, control & automation system concept design right through to final commissioning. Coal is brought to the crushing plant, crushed and transferred by conveyors to the truck loading bin, before being loaded into trucks and transported to the train load-out.

Job Name: *Hexham Bridge*
Client: *Roads & Maritime Services*
Location: *NSW, Australia*
Type: *South Bound Automation Upgrade*

The Hexham Bridge is located at the junction of the Pacific Highway and the New England Highway and joins the two roads across the Hunter River.

As a result of ongoing reliability issues and operating difficulties, CDMS Electrical Engineers was engaged by Roads and Maritime Services to provide electrical design and drawings for the automation upgrade of the bridge. This included electrical drawings and implementation of a PLC control system as per an approved functional specification. A touch screen type operator interface was configured to work in conjunction with the PLC program.

SERVICES

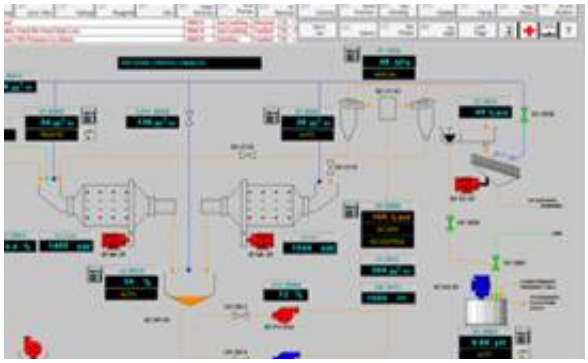
EXAMPLES OF PREVIOUS PROJECTS

Job Name: *Curragh Coal Mine*
Client: *Wesfarmers Energy*
Location: *NSW, Australia*
Type: *Bucket Wheel Reclaimer Upgrade*

CDMS Electrical Engineers was involved in several upgrades at Curragh Coal Mine.

The upgrade involved incorporating both power systems and automation & control, for the train load-out, stacking and reclaiming areas, HV infrastructure and dragline rebuild/overhaul at the mining site

Job Name: *Tritton Copper Mine*
Client: *Tritton Resources Limited*
Location: *NSW, Australia*
Type: *Wonderware SCADA Upgrade*



CDMS was engaged by Tritton Copper mine to resolve a problem with their existing Wonderware SCADA installation that others, in the past, had failed to rectify.

New servers were specified, installed and fully configured to manage communications from all the PLC's onsite while ensuring the continuity of SCADA services to allow uninterrupted copper production. As a result, communication speeds improved from an extremely slow 10 – 15 seconds to a acceptably fast 100 ms to 500 msper update.

CDMS also specified the necessary hardware and software improvements to allow for a timely upgrade program.

SERVICES

EXAMPLES OF PREVIOUS PROJECTS

Job Name: *RTAC SEL Relay*
Client: *Confidential*
Location: *NSW, Australia*
Type: *Control Desk Automation Upgrade*

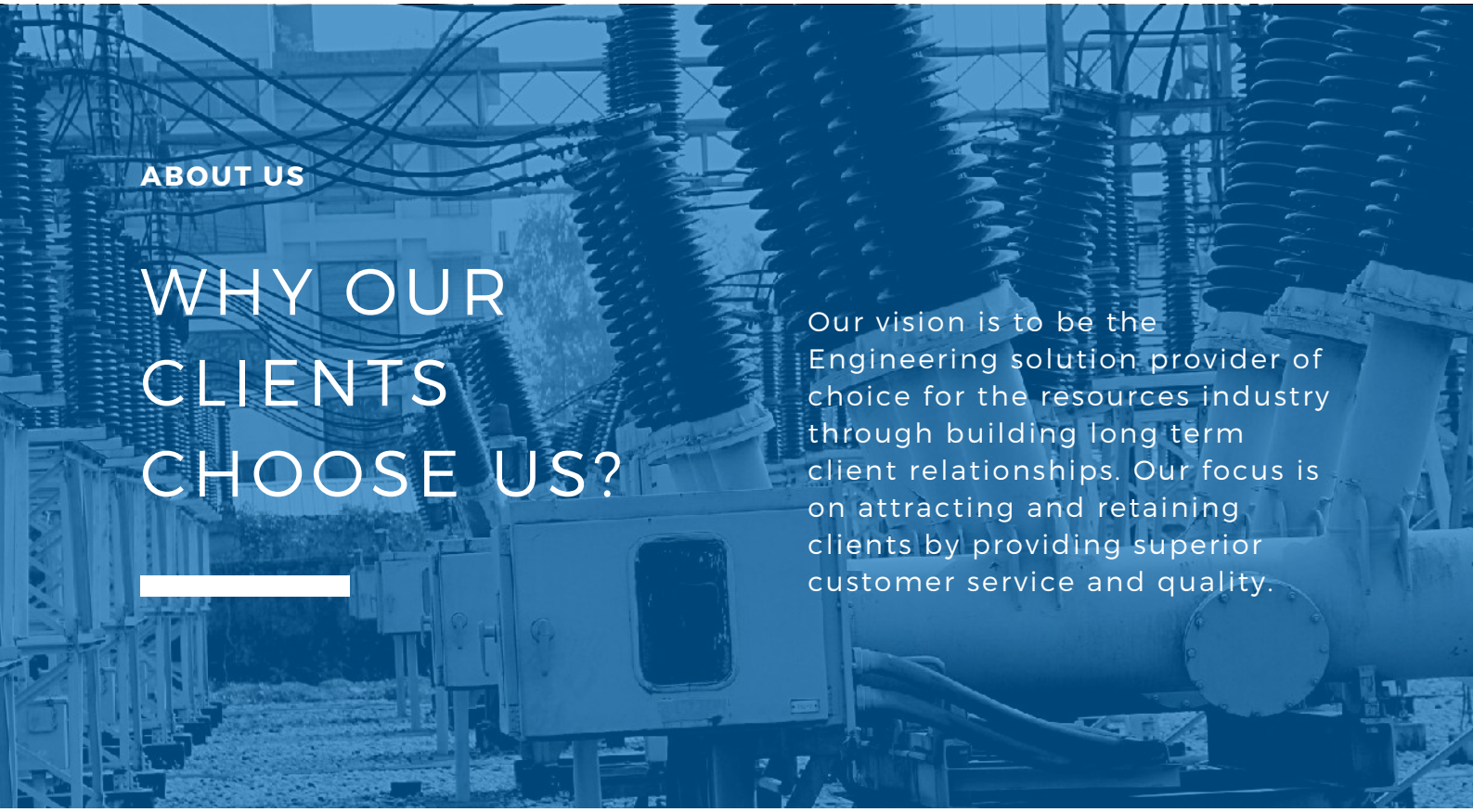
CDMS Electrical Engineers programmed and commissioned an RTAC SEL Relay (SEL 3530) which serially connects existing customer site SEL relays together with Wonderware (or other SCADA systems).

The RTAC relay enables data to be collected for use in SCADA while also allowing for a Quickset connection to the relay to integrate it and make setting changes. While the Quickset connection is in use, the RTAC suspends the SCADA data and reinstates it after use or after a timeout. Once an RTAC is installed it also allows for automated monitoring and security of relay settings on a regular basis.

Job Name: *Hanson Quarry - Brandy Hill*
Client: *Hanson Heidelberg Cement Group*
Location: *NSW, Australia*
Type: *Electrical Procedures & Compliance*

CDMS Electrical Engineers became the Electrical Engineers in charge for a number of Hanson Quarry sites, being responsible for electrical requirements of each site.

The services provided included compliance audits, design upgrades, ISMP development, implementation and training.



ABOUT US

WHY OUR CLIENTS CHOOSE US?

Our vision is to be the Engineering solution provider of choice for the resources industry through building long term client relationships. Our focus is on attracting and retaining clients by providing superior customer service and quality.

1. We share their prioritising of safety and the environment
2. We respect, cooperate and build lasting relationships
3. They prefer our commitment to client satisfaction
4. We deliver quick turnaround times
5. They trust our professional expertise
6. Our multi-disciplinary expertise provides full project delivery
7. We provide value engineering to give economic results
8. We understand the client's needs and objectives
9. They rely on our accuracy and efficiency
10. We engineer solutions that minimise business risks
11. Our services are supported by personalised practical solutions
12. We add value to their projects through technical innovation

METS ENGINEERING
PROCESS + INNOVATION

PROCESS & METALLURGY

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