



Design Services

PSD Energy employs a comprehensive in-house design team of qualified chartered engineers, design engineers and project engineers to carry out and certify detailed electrical design. The team is supported by experienced drafters to execute design services to any form of specification. Capabilities include detailed HV substation design; civil, mechanical, electrical - primary and secondary / SCADA designs to any required design standards or client specification.

Primary Design

- > Design drafting of substation arrangements, sections and details (AS2067)
- > Tubular and strung busbar design including: sag, expansions, tension, short circuit, seismic, wind loading calculations (AS3865, IEC865; AS1170)
- > Conductor, busbar and bolted connection current rating calculations (AS1531, IEEE738; AS62271)
- > Power cable sizing calculations (IEC60287 & CYMCAP Software)
- > AS3000 design and cable sizing calculations
- > Insulation co-ordination assessment and studies (EMTP-RV Software & IEC60071)

- > EMF assessment and studies (CDEGS Software)
- > Earth grid design and assessments (CDEGS Software & IEEE80)
- > Specifications for substation primary plant
- > Lighting design (AGI32 3D modelling)
- > Lightning protection (AS1768)
- > Air conditioning sizing (Camel Software)
- > Detailed bill of quantities and material SEL-2440 DPAC
- > Legacy SEL-2030 / SEL-2032

Structural Design

- > Design Drafting of steel work arrangements and support structures
- > Structural load calculations including

structural member sizing, deflection, seismic and wind loading calculations (AS1170)

- > Detailing of lattice structures for gantries and terminal towers

Civil Design

- > Design drafting of substation civil arrangements, sections and details
- > Bulk earthworks design (AutoCAD Civil 3D)
- > Equipment foundation design
- > Drainage design
- > Design of conduit and duct systems
- > Roads, pavement and fencing design
- > Substation building architecture and structural design

Software and Design Package Proficiency

- > Bentley MicroStation V8i & MicroStation AECOSim
- > AutoCAD & AutoCAD Civil 3D
- > DIgSILENT PowerFactory power system software
- > CYMCAP cable ampacity calculation
- > CDEGS earthing software
- > AGI32 lighting software
- > EMTP-RV power system transient modelling software
- > Camel air conditioning loading software
- > Manufacturer proprietary device configuration software

Secondary and Protection Design

Writing and reviewing of relevant client specifications, including:

- > Project scope of works
- > Design standards and manuals
- > Functional design specifications (FDS)

Complete IEC 61850 expertise including technology integration and consulting services including:

- > Successful integration using alternative relay manufacturers
- > IEC 61850 system configuration
- > GOOSE and MMS design and testing
- > Ethernet communications network design, documentation and testing
- > Integration between protection relays and SCADA equipment
- > Systems are designed to meet redundancy and fault clearing time performance required by the National Electricity Rules
- > Built-in design features to ensure future maintenance, modifications and

upgrades are not obstructed

- > SCADA master station communications via legacy protocols
- > Standards development and documentation

Load flows and fault calculations

- > Project scope of works
- > Design standards and manuals
- > Functional design specifications (FDS)

Protection coordination and grading studies

- > Comprehensive protection setting philosophy and calculation reports
- > Development of relay setting files

Secondary, control and protection designs

- > Preliminary and concept design including single line diagrams, communications network architectures, control building layouts, selection of protection and control relays, and protection and control philosophy documentation
- > Detailed design drawings and documentation including protection and control panel layouts, schematics, wiring diagrams, cable and termination schedules, and interfacing to new and existing plant and equipment
- > As-built drawing updates incorporating all onsite amendments

Development of training and operating manuals for protection and control systems

Fault investigation, analysis and remedial works

SCADA Design

Complete design and integration of Substation SCADA and communications services

Design and Programming Services

Ethernet networking design for industrial and substation applications

HMI design services

- > Siemens WinCC
- > GE iFix
- > Citec
- > Clear SCADA
- > IA SCADA
- > Tailored / Custom developed

Industrial / Substation communication design

- > IEC61850
- > Profibus
- > DNP
- > Modbus
- > IEC 103
- > Tailored / Custom developed

Industrial / Substation Data acquisition and control

- > Allen-Bradley PLCs
- > Siemens PLCs
- > Siemens SICAM PAS RTU
- > GE D20 / D200 RTUs
- > Invensys Foxboro C50 / SCD5200 RTUs
- > SEL-3530 RTAC



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