

High-Voltage System Design

MEGAVAR

PARTNERS IN POWER

About Megavar

High voltage substation design is the primary, secondary, protection design and SCADA engineering that takes a substation or connection asset from concept to as-built. Megavar designs high-voltage systems from concept through to as-built: primary layout and plant, secondary protection and control, SCADA and communications, and the earthing, EMF and lightning protection modelling underneath them. Founded in 2003 and Australian owned, we work from five offices and deliver across five states. Because we also test and commission what we design, our drawings are produced by engineers who will be on site when the scheme is proven.

What We Do

Primary, secondary and SCADA design for substations and connection assets, with earthing, EMF and lightning protection modelling in CDEGS.

Where We Work

From offices in Hobart, Launceston, Adelaide, Newcastle and Gladstone, delivering across Tasmania, South Australia, Victoria, New South Wales and Queensland.

Why It Matters

A design that cannot be commissioned is not finished. Ours are drawn by engineers who energise substations, so buildability and testability are designed in rather than discovered on site.

Megavar at a Glance

Established
2003. Australian owned and privately held.

People
57 engineers, technicians and support staff.

Offices
Hobart, Launceston, Adelaide, Newcastle and Gladstone.

Coverage
Tasmania, South Australia, Victoria, New South Wales and Queensland.

ABN
88 104 344 765



Primary Design

Substation Arrangement

General Arrangements
Substation general arrangements, sections and details to AS 2067, with bills of quantities and materials.

Switch and Control Rooms
Switch room and control room arrangements for the substation environment.

Oil Bunding and Blast Walls
To AS 2067, AS 1140, AS 3735, AS 3600 and AS 3700.

Busbars
Tubular and strung busbar design for short circuit and load level, sag, tension and expansion.

Structures and Foundations

Plant Support Structures
Structures and foundations for weight, short circuit, seismic, wind, snow and ice loading.

Standards Applied
AS 3865, AS 1170, AS 4100, AS 4680, AS 2312, AS 4312 and AS 3995.

Lightning Protection
Layout development in SES Shield (CDEGS) to AS 1768 and IEEE 998.

Lighting
Lighting design and fitting specification.

Cables and Plant

HV Cable Sizing
To IEC 60287, AS 1429, AS 1125, AS 1931, IEC 60986 and IEC 60502.

LV System Design
Low voltage system design to AS 3000, with cable sizing to AS 3008.

Plant Specifications
To AS 62271, AS 60076, AS 60214, AS 60044, AS 60137 and IEC 61462.

Insulation Coordination
To AS 1824 and IEC 60071.

Modelling and Assessment

Earth Grid Design
MALT, MALZ and HIFREQ in CDEGS to AS 2067, ENA EG-0 and EG-1, AS 3835, AS 4853 and IEEE 80.

EMF Modelling
HIFREQ in CDEGS, assessed against NHMRC guidelines and site-specific requirements.

Power System Studies
Fault level, load flow, protection coordination and arc flash studies across all voltage levels.

Secondary, Protection and SCADA Design

Specifications and Studies

Client Specifications
Scope of works, design standards and manuals, and functional design specifications.

Protection Coordination
Grading studies, setting philosophy and calculation reports.

Relay Settings
Development of relay setting files.

Fault Investigations
Post-event analysis and remediation design.

Protection and Control Design

Concept Design
Single line diagrams, communications architectures, control building layouts, relay selection and control philosophy.

Detailed Design
Panel layouts, schematics, wiring diagrams, and cable and termination schedules.

Interfacing
Interfaces with new and existing plant and equipment.

As-Built and Manuals
As-built updates from redline markups, and protection and control operating manuals.

SCADA and Communications

Substation SCADA
Complete design and integration, including substation Ethernet network design.

IEC 61850
System configuration, GOOSE and MMS design, and multi-vendor relay integration.

HMI Platforms
Citect, ClearSCADA and IA SCADA.

RTUs
GE D20, D200 and D25; Foxboro C50 and SCD5200; Siemens Sicam PAS; SEL RTAC and Axion.

Software

Drafting
Bentley MicroStation and AutoCAD.

Power Systems
DIgSILENT PowerFactory, ETAP and PTW.

Earthing and EMF
CDEGS, including MALT, MALZ, HIFREQ and SES Shield.

Credentials and Commitment

Accreditations and Licences

Certified Management Systems
ISO 9001, ISO 14001 and ISO 45001, certified since 2015.

Certified Scope
Planning, design and delivery of high voltage electrical and engineering projects, including project management, engineering consultancy and equipment rental.

Electrical Contractor Licences
Held in every Australian state: NSW 284109C, VIC 21203, QLD 73595, SA PGE 267537, WA EC010840 and TAS 947267.

Insurance
Professional indemnity $10 million, public and products liability $20 million, cyber liability $1 million.

Test Instrumentation
An owned Omicron and Megger fleet including CMC 356 and CMC 500 relay test sets, CPC 100 primary test set, CIBANO 500 circuit breaker analyser, TESTRANO 600 and FRANEO 800 transformer test systems, MPD 600 partial discharge system and MIT and DLRO testers, calibrated to NATA-traceable standards.

Next Step
Read more about high voltage system design on megavar.com.au
Request a quote
1300 730 499 | service@megavar.com.au

Clients and Sectors

Networks
Transgrid, ElectraNet, TasNetworks, Essential Energy, Evoenergy, Powercor, AusNet, Western Power, Zinfra and Jemena.

Principal Contractors
Downer, Ventia, RJE, Enerven, CPP, ACLE, RBD and Worley.

Renewable Generators and OEMs
Acciona, Vestas and Goldwind.

Industry
Alcoa Portland.

Sectors
Network augmentation, wind, solar and battery storage connections, and heavy industry.

Other Megavar Capability Statements
One is available for every Megavar service line. Ask your Megavar contact or email service@megavar.com.au.

Why Megavar

Design and Testing in One Business
The people testing the system understand how it was designed.

Independent
No plant to defend and no construction programme to protect.

Designed to Be Commissioned
Drawn with the test plan in mind, so energisation holds no surprises.

Records That Survive Audit
Results, calculations, sign-offs and defect registers, as one pack.

Our Principles

Integrity
When Megavar does it, you know it has been done right.

Responsiveness
When clients need us most, we will be there every time.

Teamwork
Only together can we achieve great outcomes.

Accountability
We hold each other to high standards, and fix what we get wrong.

Safety
Looking out for each other gets us home safe.

Speak to our team today

megavar.com.au

MEGAVAR

service@megavar.com.au

1300 730 499