



# HV System Design

## Our services

Megavar specialises in high voltage design, testing, commissioning and asset maintenance for our clients. Our experienced engineers and designers will work closely with you to deliver quality outcomes across your power generation, transmission and distribution assets.

At Megavar we pride ourselves on being able to tailor services to meet client needs. We can deliver full end to end services and specific work packages or simply provide services at an hourly rate.

## Our people

Our engineers have proven power system design experience, and are able to provide the full range of design services to our customers. We are able to mobilise at short notice, as many of our people are multi-skilled across design, testing, commissioning and project management.

## Primary design

Megavar offers the full suite of primary design services for switchyard layouts, footing and foundations, switchyard gantries, circuit breakers, transformers, capacitor banks, strung and tubular bus, equipment clearances, lighting, noise studies and AC/DC system integration. Our specialist engineers are highly skilled in:

- Primary design layer
- Calculations of short circuit forces on equipment and structures
- Arc flash design and assessment
- Insulation coordination
- Lightning protection
- GPATS analysis
- Electric and Magnetic Fields (EMF)
- Earthing systems.

## Earthing design

Earthing systems are an essential element of the electricity network, ensuring appropriate equipment response and safety for asset operators and the general public. Earthing system response can extend beyond an asset owner's boundary fence, and requires a unique and highly skilled design approach.

We design earthing systems in strict adherence to Australian and international standards, using the powerful earthing and grounding system software CDEGS™.





## Insulation coordination and lightning protection

Megavar offers a complete end to end product suite in lightning protection including design of insulation coordination and direct lightning strike systems. Our skilled engineers have extensive experience in HV, EHV and power generation/ switchyard sites and transmission line assessment for lightning backflashover, and a proven track record in designing for compliance with standards.

Our insulation coordination and lightning protection designs are analysed using industry recognised software such as SES Shield and EMTP-RV in the frequency domain spectrum. Our solutions quantify residual risk of exposure to lightning surges.

## Distribution design and installation

Megavar provides the full range of design services for distribution design, substation and associated HV infrastructure projects, including: building/ enclosure design, equipment specification, protection studies and settings, fire protection systems, oil containment, earthing studies and all other requirements in line with Australian standards and industry best practice.

We provide engineering certification and documentation for regulatory compliance including OH&S, testing, maintenance and operational plans and switching/ isolation procedures.

## Secondary design

Megavar engineers design, integrate and configure system protection, automation and control settings. We offer detailed device layout designs for site optimisation and system expansions, and detailed design and as-built drawings for construction projects in brownfield and greenfield environments.

With any high voltage installation, it is critical to prove the entire system fit for purpose with rigorous functional and relay protection testing. Megavar performs comprehensive testing for all types and vintages of protection and control apparatus to ensure that trips, alarms and controls function as designed.

## SCADA design

Designing, integrating, implementing, testing and commissioning a SCADA (Supervisory Control and Data Acquisition) system, DMS (Distribution Management System), TMS (Transmission Management System) or EMS (Energy Management System) can be a complex challenge.

Megavar SCADA engineers are highly experienced in field and operational environments. We understand primary energy assets, protection automation and control systems, supporting communications and security infrastructure. Megavar can design, integrate, implement, test and commission SCADA systems to meet your requirements.

We provide solutions to monitor, control and automate systems in the field using RTUs (Remote Terminal Units), IEDs (Intelligent Electronic Devices), PLCs (Programmable Logic Controllers) and other field devices, as well as solutions to monitor, control, automate and report from a central control room master.

## Overhead powerline and fibre optic design

Megavar has significant capabilities and skills in this area. We are able to audit existing power lines, design new power lines and produce all relevant design documentation in whatever format is required by our clients. This could include:

- plans of existing power lines (heights, sags, locations)
- designs for new power or fibre optic cables
- work plans for upgrades to existing infrastructure
- work plans for new installations detailing construction types, sag tables, attachment heights and stringing tensions
- powerline elevations, plans and printouts
- schedules of existing infrastructure and new cables
- equipment schedules.

Please contact us to discuss your requirements and how we can assist your business.

