

BESS Commissioning and Maintenance

MEGAVAR

PARTNERS IN POWER

About Megavar

A battery energy storage system (BESS) is a grid-connected battery, its power conversion and battery management systems and the high voltage plant that connects it to the network. Megavar commissions and maintains the HV balance of plant on BESS projects from 5 MW to 500 MW: switchgear, transformers, protection, SCADA, earthing and AEMO hold point testing, delivered by engineers who have energised substations for twenty years.

What We Do

BESS commissioning from pre-commissioning review to AEMO R1 and R2 hold point testing and energisation, and annual HV maintenance and condition testing of the battery energy storage system balance of plant.

Where We Work

From offices in Hobart, Launceston, Adelaide, Newcastle and Gladstone, deploying to BESS projects in every state and territory, metropolitan and remote.

Why It Matters

A BESS earns nothing until the NSP and AEMO sign off, and a missed hold point costs weeks. Independent engineers who know the NER, the GPS and the plant get the system to market on time and keep it there.

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



BESS Commissioning

Pre-Commissioning Review

Design Review
Single line diagrams, protection schematics, SCADA architecture, BMS configuration and thermal design checked against the connection agreement and Generator Performance Standards.

FAT Data Review
PCS inverter, transformer, switchgear and battery module factory acceptance records reviewed for deviations before site installation.

Commissioning Plans and ITPs
Commissioning plans, inspection and test plans and hold point schedules aligned with NSP and AEMO requirements.

Standards Applied
National Electricity Rules, AEMO connection procedures, NSP standards, AS 2067, IEC 61850 and DNP3.

Component Testing

HV Switchgear
Primary injection, contact resistance, insulation resistance, SF6 checks and functional operation with the CPC 100, CIBANO 500 and DLRO.

Transformers
Turns ratio, winding resistance, tan delta, SFRA, dissolved gas analysis and vector group with TESTRANO 600 and FRANEO 800.

Protection Relays
Secondary injection with the CMC 356 and CMC 500: settings, trip times and scheme logic for overcurrent, earth fault, differential, distance and anti-islanding protection.

CTs, Earthing and DC
CT ratio, polarity, burden and magnetisation curves; earth grid resistance, step and touch potentials; battery chargers, DC distribution and UPS.

System Integration Testing

BESS SCADA
End-to-end point-to-point verification of DNP3, IEC 61850 and Modbus, alarm propagation and remote control between the EMS, site SCADA and the NSP and AEMO control rooms.

BMS and PCS Integration
BMS communication with PCS and SCADA; state of charge reporting, cell balancing, thermal alerts and emergency shutdown sequences.

Performance Testing
Charge and discharge cycling, ramp rate, reactive capability, frequency response and grid-forming to grid-following mode switching.

Fire Systems
Enclosure fire detection and suppression functional tests, integrated with BMS shutdown and SCADA annunciation.

Grid Compliance and Energisation

Hold Point Testing
AEMO R1 and R2 hold point tests for active power control, reactive capability, voltage control, frequency response and fault ride-through, with the procedures and documentation the NSP and AEMO require.

Energisation
On-site engineering for HV and transformer energisation and the first charge and discharge cycles.

Performance Verification
Post-energisation monitoring and tuning of contracted capacity, round-trip efficiency and response time.

BESS Maintenance and Testing

Switchgear and Protection

Circuit Breakers
Timing, contact resistance, insulation resistance and operation count; gas pressure, moisture and SO2 checks on SF6 switchgear.

Protection Relay Testing
Settings, trip times and scheme logic verified with the CMC 356, including intertripping, breaker failure, busbar and differential schemes, and a settings audit against the approved schedule.

Instrument Transformers
Ratio, polarity and burden testing with the CT Analyser.

Arc Flash Protection
Light sensor and trip time testing where arc flash detection relays are installed.

Transformers and Oil

Electrical Testing
Turns ratio, winding resistance, insulation resistance, tan delta, SFRA and excitation current.

Oil Analysis
Dissolved gas analysis, BDV, moisture, acidity, IFT and furans, interpreted by Duval Triangle and Key Gas methods to AS 1767 and IEC 60422.

Tap Changers and Cooling
Dynamic resistance, transition timing, motor current and compartment oil sampling; fan and pump operation and cooling control logic.

SCADA, Earthing and Auxiliaries

SCADA and Communications
Control, status, analogue and alarm points verified between site SCADA, the EMS and the NSP and AEMO control rooms, with redundancy and failover tests.

Earthing
Earth resistance, step and touch potentials and bonding continuity with the AEMC 6471 and Red Phase injection set.

DC and Fire Systems
Battery charger, DC distribution, changeover and UPS verification; fire detection functional tests and enclosure cooling checks.

Condition Monitoring and Reporting

Trending
DGA, insulation, contact resistance and relay drift tracked across campaigns to catch developing faults before an outage.

Thermal Imaging
FLIR E75 surveys of switchgear, connections and transformers under load.

Digital Records
Field data captured on tablets, giving owners searchable maintenance records and asset condition histories.

Maintenance Cycle
Annual HV plant maintenance as standard, with first-year DGA baselines and relay testing to NSP requirements.

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 fleet: CMC 356 and CMC 500, CPC 100, CIBANO 500, CT Analyser, TESTRANO 600 and FRANEO 800, with Megger MIT and DLRO, FLIR E75 and AEMC testers, calibrated to NATA-traceable standards.

Next Step
Read more about BESS commissioning and maintenance 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
Grid-scale and distributed BESS projects, wind and solar connections, network augmentation 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

Commissioned and Maintained by One Team
The engineers maintaining a BESS often commissioned it, so its protection philosophy is already known.

Independent
Technology-agnostic across all BESS makes, with no OEM relationship.

Hold Points Delivered
R1 and R2 procedures, execution and the documentation AEMO and the NSP need.

Records That Survive Audit
Digital field records, condition trends and sign-offs, in 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

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