

POWER NETWORKS

Grid Connections and Planning

We help clients progress complex grid connections efficiently towards connection approval and commissioning.

Overview

Connecting to the grid involves complex technical, regulatory and network requirements that can have significant implications for project cost, timing and performance. Our power systems specialists help developers and asset owners identify risks early, resolve technical challenges and make informed decisions throughout the connection process.

Supporting your grid connection journey

Connection requirements and technical challenges evolve as projects progress. We provide specialist engineering support at every stage, helping clients manage risks and keep projects moving.

01 | Connection enquiry & strategy

02 | Connection application

03 | Generator performance standards & negotiation

04 | Registration & compliance (R1)

05 | Testing & model validation (R2)



Key capabilities

GRID CONNECTION STRATEGY & NETWORK PLANNING

- Connection strategy and options
- Feasibility studies
- Transmission and distribution network planning
- Wide-area and Full Impact Assessment studies
- System strength, network constraint and congestion studies
- Independent technical review and advisory

CONNECTION APPLICATIONS & GPS

- R0 connection application studies
- Generator Performance Standards (GPS) studies
- PSS/E, PSCAD and PowerFactory static, dynamic and transient studies
- Dynamic model development, validation and tuning
- GPS negotiations and technical support with AEMO and Network Service Providers (NSPs)

REGISTRATION, COMMISSIONING & COMPLIANCE

- R1 registration studies and compliance support
- R2 model validation studies and hold-point testing
- Generator compliance assessment and monitoring
- Due diligence for system operators and NSPs

GENERATOR TESTING & MODEL VALIDATION

- Governor and Automatic Voltage Regulator (AVR) testing
- Frequency response, stability, deadband and step-response testing
- Power System Stabiliser and excitation limiter testing
- Simulation/test-result comparison, model tuning and validation
- Custom model development and source code for excitation and governor systems

Our Experience

Inverter-based Resources

WIND | SOLAR | BESS

Synchronous Generation

HYDRO | GAS | THERMAL

Large loads

MINING | OIL & GAS | DATA CENTRES

Quorn Park Hybrid Solar Farm

Quorn Park combines an 80 MW solar farm and 20 MW BESS behind a single point of connection. As an early hybrid connection, it brought emerging technical complexities to the connection process. PSC supported the project through R0 and R1, developing the GPS and undertaking connection studies and model development to help secure a compliant 5.3.10 letter and registration approval.

Clarke Creek Wind Farm

Connecting to Powerlink's 275 kV network, Clarke Creek presented system strength challenges that required the incorporation of a synchronous condenser. PSC developed the GPS, worked with Goldwind and equipment manufacturers on model development, and supported the project through the connection process to a 5.3.4 letter and offer to connect.

Waratah Super Battery

With 850 MW of capacity and 288 inverters, the Waratah Super Battery required rigorous grid connection and commissioning to demonstrate compliance with NEM and NSP requirements. PSC delivered R2 model validation studies and hold-point testing. When a major transformer issue interrupted final hold-point testing, the remaining program was completed under a reduced plant configuration. The battery has since achieved full commercial operation.

Appin and Tower Power Station

EDL was upgrading the generation and control systems at Appin and Tower Power Stations and needed models developed and benchmarked across PSS/E, PSCAD and PowerFactory. PSC's scope extended from R0 and R1 submissions through to R2 testing and post-commissioning validation of the AVR and governor upgrades.

Renewable Integration Planning in Victoria

AEMO wanted to understand how proposed renewable generation connections could affect the Victorian transmission network. PSC carried out high-level planning studies to assess potential network congestion and to determine whether planned augmentations identified through the Victorian Annual Planning Report and National Transmission Network Development Plan would be sufficient to accommodate future connections or whether additional solutions may be required.

Snowy Hydro Generator Testing & Compliance

PSC has a long-term partnership with Snowy Hydro, providing power system studies, generator compliance testing, and modelling services across its hydro generation assets, covering more than 20 generators across 8 stations.

The work spans R1 and R2 commissioning support, excitation (AVR) and governor testing, dynamic model development and validation (PSS/E and PSCAD), and NER compliance testing, supporting ongoing compliance and reliable operation across its portfolio.

EIPC Generator Compliance in New Zealand

New Zealand generators require testing to demonstrate compliance with the Electricity Industry Participation Code (EIPC). PSC's experience includes governor compliance testing for all nine hydropower stations on the Waikato River and geothermal stations, as well as AVR and governor testing at South Island hydro stations using Genassure.

Genassure

PSC's in-house generator performance testing system

Genassure combines automated testing with high-speed, high-precision data acquisition to independently verify generator performance and compare modelled behaviour with real-time operation.



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