

Voltex Power Engineers

We manage electrical risk and improve plant reliability through design, protection, commissioning, auditing, maintenance and asset management.

Head Office

Level 19 AMP Place
10 Eagle St
Brisbane QLD 4000
AUSTRALIA
t: +61 7 3303 0197
e: info@voltex.com.au
www.voltex.com.au

Locations

Brisbane
Sydney
Melbourne
Perth
Darwin
Santiago



Licence No: 72239



Renewable Energy
GC4 Grid Connection

VOLTEX
power engineers

HV Electrical Engineering Consultants

As trusted HV Electrical Engineering Consultants, **Voltex Power Engineers** (VPE) provide expertise in HV Power Systems and earthing design, equipment specifications and technical manuals, and power systems studies and analyses.

Voltex assist clients with HV installation testing and commissioning, including protection schemes, substation automation systems, and all aspects of renewable energy project grid connections.

HV Renewable Energy

Voltex Power Engineers' GC4 program provides a total solution for Scheduled and Semi-Scheduled Intending or Market Participants in the Australian National Energy Market (NEM).

AEMO Grid Connection (GC4)

The Australian Energy Market Operator (AEMO) manages the wholesale NEM which includes generation, transmission and large industrial energy users, in accordance with the National Electricity Rules.

The NEM infrastructure comprises state and private assets managed by industry participants and spans Australia's eastern and south-eastern coasts through interconnection of the states of Queensland, New South Wales and the Australian Capital Territory, Victoria, Tasmania and South Australia as five regional market jurisdictions. Retailers purchase electricity from the NEM and on-sell it to consumers.

Generator Performance Standards (GPS)

NEM Grid Connection Applications require the proponent to provide a "GPS R1" model in accordance with the AEMO Dynamic Model Acceptance Test Guideline. This includes more than 200 individual simulations to confirm the design meets the assessment and testing process AEMO undertakes before accepting plant models at the R1 (pre-connection) stage.

Once the application is accepted, then construction may commence, and subsequently, testing on-site for GPS R2 model validation in line with AEMO's "GPS Compliance Assessment and R2 Model Validation Test Plan Template". This is the critical requirement for the energisation of the new plant. Unlike modelling and simulation of an existing plant, where the model is adjusted to match the performance of the plant under a verification process, the GPS R2 verification requires that the plant must match the approved (R1 model) performance, and if there are discrepancies, the plant must be modified before connection to the grid will be authorised. Failure to do so could result in reduced output limits or rejection of the connection application.

Network Service Providers (NSPs)

Network Service Providers (NSPs) engage in the activities of owning, controlling or operating a transmission (TNSP) or distribution (DNSP) system and are registered with AEMO. The Grid Connection process for any Intending Market Generator requires a deep understanding of the six (6) key phases, and of the requirements of AEMO and the Applicant's chosen NSP. AEMO advice is that an indicative timeframe for the entire process may require a duration from 2 months to 24 months. Early engagement with the chosen NSP is considered critical. The different NSPs participating in the various regions of the NEM establish their own compliance requirements and additional studies, often including different software modelling from AEMO.

System Strength Impact Assessment

Since the emergence of a growing political and environmental trend for renewables, the industry in Australia has recognised the potential impacts of increased generation from non-synchronous systems on the grid. To assess and if necessary, counter these impacts, AEMO has developed System Strength Impact Assessment requirements. Such updates to the Application requirements require ongoing familiarity with the process and all stakeholders.

National Energy Rules (NER)

As part of the registration process, applicants must nominate the markets and categories they wish to register for. Applicants must also familiarise themselves with the rules and procedures for those markets. A number of new applicants, both domestic and international, have struggled with the processes, and experienced issues including commercially unacceptable delays, reduction in planned output to meet compliance requirements, and even legal proceedings with counterparts.

Quality is critical

Quality, consistent, RPEQ endorsed connection package is critical for efficient Due Diligence, R1 and Commissioning.

Rework is expensive

Rework often "resets" timing, can lose access to resources experienced with your project results in lost time and money."

Voltex Power Engineers GC4 program provides market participants with engineering, consultation and guidance throughout all of these processes for renewable generators wishing to make an application to connect to the grid. Mitigate your risks with our Principals' combined 100 years of engineering industry knowledge and experience.

