



# Due diligence for Iberdrola Australia's proposed 136.8 MVA gas turbines


## Overview

*As South Australia's sole electricity distributor, SAPN has the mission-critical role of building and maintaining the infrastructure to deliver power to over 900,000 homes and businesses. As new generating systems are submitted for connection to the grid, SAPN must conform to all rules and requirements to always ensure the ongoing secure and stable operation of the power system.*

The proposed Bolivar Power Station (BPS) generating system owned by Iberdrola Australia SAGT Pty Ltd (Iberdrola Australia) contains 4 x TM2500 GE gas turbines. The BPS site is located at the end of a 1.6 km long 66 kV single circuit feeder from Parafield Gardens West Substation. BPS is comprised of 4 x 34.222 MVA generators and the agreed capacity at the connection point is 127.5 MW at 5°C.

Iberdrola Australia evaluated the technical compliance of BPS in accordance with National Electricity Rules (NER). The technical assessments included transient stability, load flow, power quality and short circuit studies to demonstrate plant compliance with the relevant NER access standards proposed.

SA Power Networks (SAPN) is the Network Service Provider (NSP) for the BPS connection and was the client for the due diligence of the above assessment by Iberdrola Australia.

<b>Client</b>	South Australia Power Networks	 <b>SA Power Networks</b>
<b>Country</b>	Australia	
<b>Year</b>	2021-2022	

## Challenge

As part of the AEMO – Australian Energy Market Operator - connection process, an independent due diligence assessment of Iberdrola Australia's connection package was required before the connection package could be submitted to AEMO for approval, and ultimately for it to be connected to the grid.

## Project solution

The due diligence was done, on behalf of SAPN, on the following connection package supplied by Iberdrola Australia:

- The power system design and settings datasheets
- The voltage control strategy (VCS)
- The generator protection report
- The PSS/E models, RUG and DMAT
- The PSCAD models, RUG and DMAT
- The PSS/E vs PSCAD benchmarking report
- The connection studies technical report
- The Generator Performance Standard (GPS) template for consistency with the connection study report and simulated test
- Results

The tasks for the due diligence assessment included:

- SMIB and NEM case setup
- NER Clause – S5.2.5.1 Reactive power capability
- NER Clause – S5.2.5.2 Quality of Electricity Generated
- NER Clause – S5.2.5.3 Generating unit response to frequency disturbance
- NER Clause – S5.2.5.4 Generating unit response to voltage disturbances
- NER Clause – S5.2.5.5 Generating system response to disturbances following contingency events
- NER Clause – S5.2.5.7 Partial load rejection
- NER Clause – S5.2.5.8 Protection of generating systems from power system disturbances
- NER Clause – S5.2.5.11 Frequency control
- NER Clause – S5.2.5.12 Impact on network capability
- NER Clause – S5.2.5.13 Voltage and reactive power control
- NER Clause – S5.2.5.14 Active power control
- NER Clause – S5.2.8 Fault Current
- PSCAD Model and Benchmarking Assessment
- Reporting



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## PSC advantage

PSC has extensive experience performing grid connection studies for connections to the NEM. PSC's experience includes working for developers, generator owner/operators, NSPs and AEMO in the development of the connection application (including the GPS) and supporting the project through the GPS negotiation phase, generator registration (R1) and generator PA12534 PSC Proposal for SAPN Penfield BESS Due Diligence commissioning (R2) phase. PSC also works with several NSPs and AEMO to perform due diligence on new and modified generator applications.

"As a network service provider, we ensure all generation connections are safely integrated into SA's distribution network to maintain power system security and stability, and compliance to all relevant rules and regulations is of critical importance for SAPN. This requires comprehensive due diligence on the connection packages prepared by potential generation developers and consultants. It's our experience that PSC has the right people with the experience and capabilities to support our team with the analysis required in a proficient and consistent manner."

*~ Sinisa Culibrk, Senior Network Project Manager, SA Power Networks*



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