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Volt-Var and Control Power Systems Capability Statement ABN: 34 622 622 664

Data Centre, Synchronous Generators (Hydro,
Gas), Solar, BESS, Wind, SVC, STATCOM

Power System Modelling Capabilities

Grid Connections Project Management

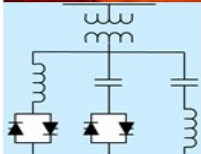
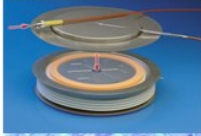
Due Diligence and & Project Owner's Engineering



Who We Are

Volt-Var and Control Power Systems provides integrated technical and renewable connection, modelling, and planning advisory services for power system and infrastructure projects, including:

- ❖ Data Centre Power Systems Connection Studies and Redflag Reports
- ❖ Grid Connection, Power System Modelling, and Testing (R0, R1, R2)
- ❖ Grid Connection Project Management
- ❖ Network Planning Support
- ❖ SVC / STATCOM Projects
- ❖ Power Quality Assessment, Investigation, and Measurement
- ❖ Owner's Engineering Services
- ❖ Specialist Engineering Training in Power Quality, SVC/STATCOMs, and Voltage & Reactive Power Control and Optimisation



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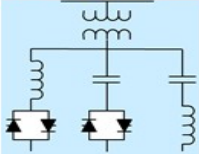
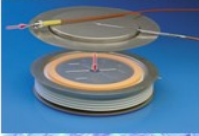




Why Volt-Var and Control Power Systems

We are experts in our field, providing clarity to complexity by combining deep energy sector expertise with a practical, outcome-driven methodology that delivers results meeting NSP and AEMO requirements.

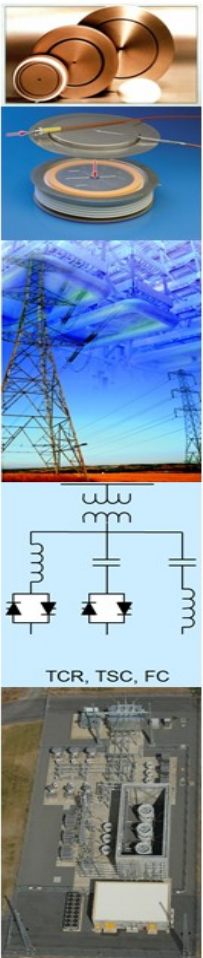
- ❖ Develop - Connection strategy, regulatory engagement, and feasibility planning
- ❖ Execute - Technical design, modelling, and implementation
- ❖ Verify - Validation, hold point testing, and compliance reviews



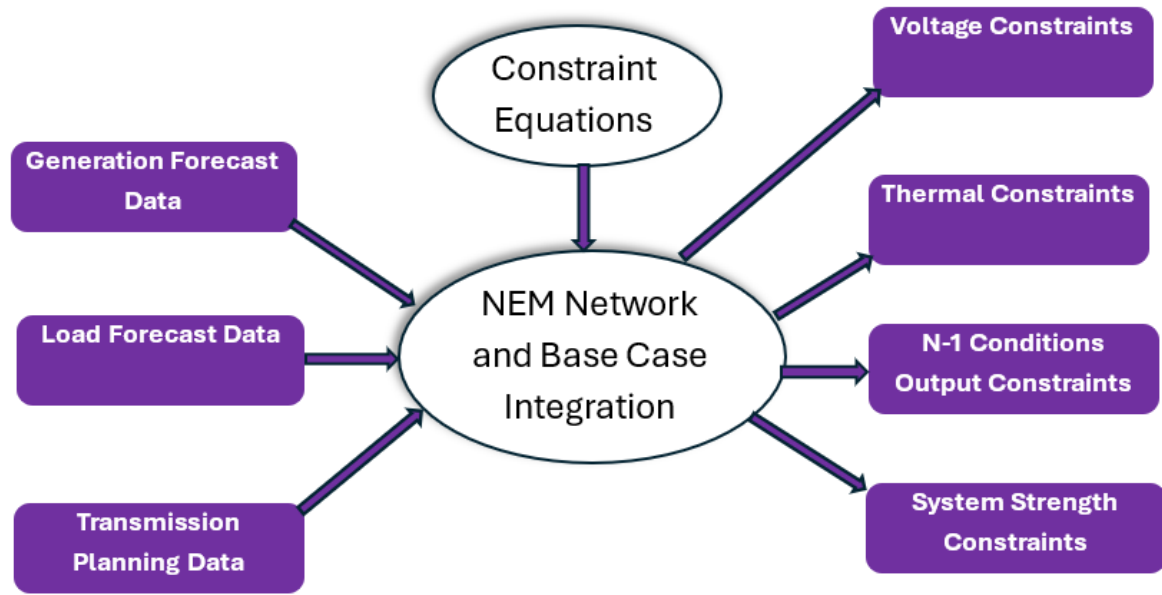
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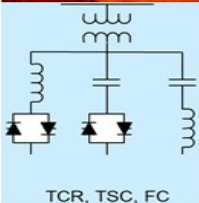
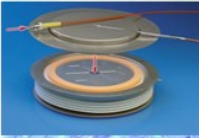
Forecast Curtailment Congestion Risk Services



We analyse and integrate forecast, planning, and network data to identify the key drivers of curtailment and congestion risk across the NEM. By mapping constraint equations and system conditions, we provide clear insights into voltage, thermal, N-1, and system strength limitations - enabling our clients to anticipate their impact on generation dispatch and network per



Knowledge and Experience



Our team combines technological expertise with regulatory experience to shorten project delivery times and ensure efficient execution.

Regulatory Engagement

In depth Knowledge of:

- ❖ NER requirements
- ❖ TNSP's & AEMO requirements
- ❖ Connection application support
- ❖ Early stakeholder engagement
- ❖ Strategic connection advice

Advanced Technical Capability

Our highly trained team bring in-depth knowledge in:

- ❖ Owners engineering high risk, high value, complex projects
- ❖ HV / MV substations & renewable design integration
- ❖ Advanced modelling capabilities
- ❖ Inverter technologies
- ❖ Power quality Assessment

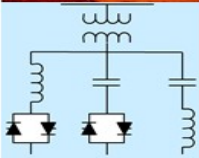
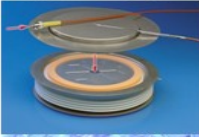
High-Performance Simulation Expertise

High efficiency custom automation script:

- ❖ Supports parallel processing
- ❖ Optimised for high-performance computing environments
- ❖ Extensive experience tuning models across multiple OEMs
- ❖ Advanced proficiency with a variety of modelling platforms



Knowledge and Experience



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Our team bring a deep understanding of control algorithms and model block structures across a broad range of wind, solar, BESS, and synchronous generation technologies. Our proven expertise in model tuning enables optimised project outcomes , enhancing system strength, stability, and compliance with NSP and AEMO performance requirements.

Vestas



TESLA



HITACHI
ABB

Ingeteam

50 YEARS ELECTRIFYING
A SUSTAINABLE FUTURE

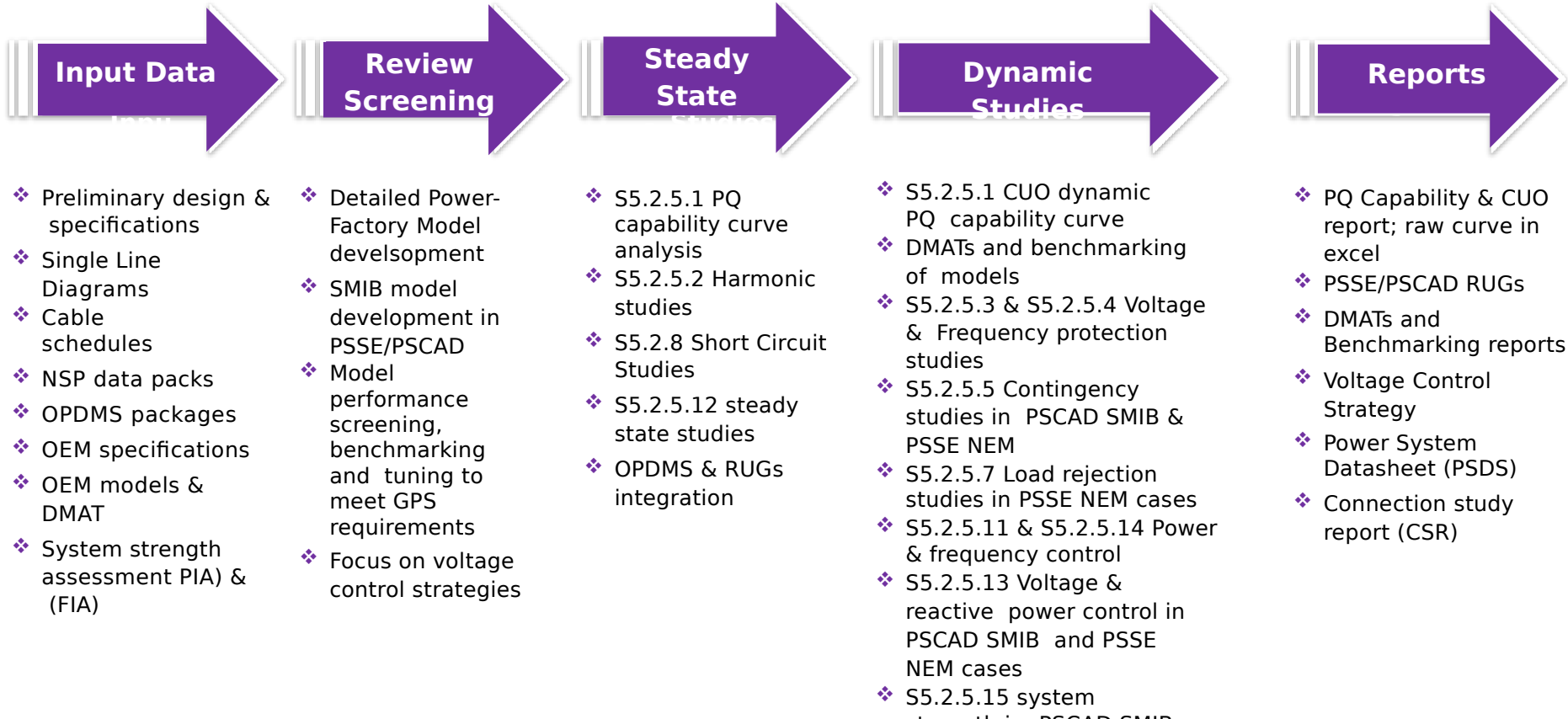


GE VERNOVA

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Generator Connection Service (R0, R1)

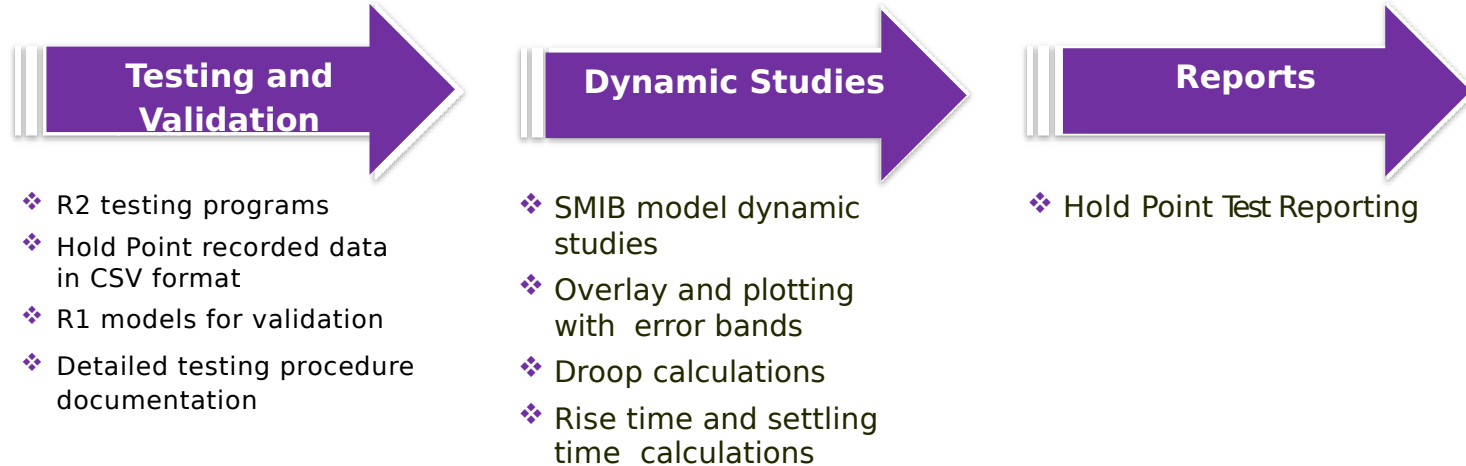
With deep experience in process optimisation, our team consistently delivers validated, high-quality outcomes on schedule, meeting the expectations of Clients, NSPs, and AEMO.



Power System Model Validation Services (R2)

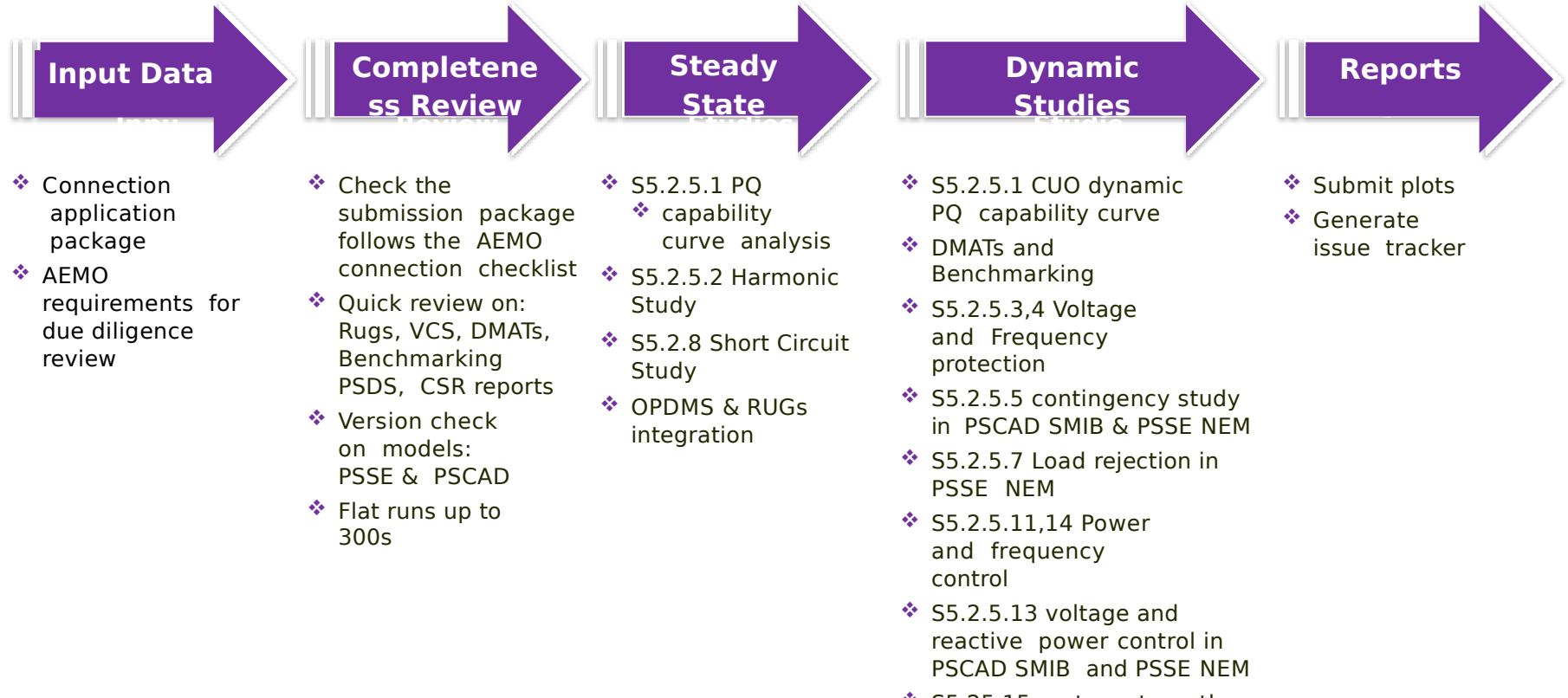
We leverage deep power-system modelling expertise to deliver high-quality model validation and Hold Point reports.

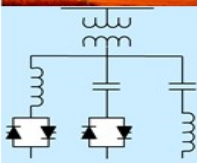
Our disciplined approach ensures models are accepted by NSPs and AEMO in the shortest possible timeframe — without compromise on technical accuracy or compliance standards.



Network Connection Application Due Diligence

Through disciplined process optimisation and rigorous due diligence, we deliver superior-quality outcomes within agreed timeframes, fostering confidence among Network Service Providers and AEMO stakeholders.





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Grid Connection Project Management Capabilities



Grid Connection Project Development

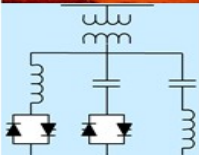
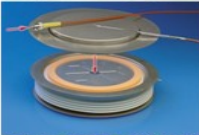
We offer specialist capability in managing the Grid Connection Development, supporting Project Owners and Developers across all stages of the connection process. From early engagement, connection enquiry to connection offers, we deliver practical, compliant, and commercially focused outcomes:

Grid Connection Application Processing

- ❖ Early Engagement on technical connection options
- ❖ Management of Grid Customer Meetings between Network Owners and Developer
- ❖ Coordination of Generator Performance Studies with NSPs and AEMO

Technical Coordination

- ❖ Management of Technical Correspondence
- ❖ Coordination of Project Reporting and Agreements
- Support for New Client Connection Agreements



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Engineer & Training Services

We provide trusted technical assurance and capability uplift across the full project lifecycle – from concept design and network integration to operations readiness and compliance. Our specialists combine deep engineering oversight with targeted training programs that build confidence, competence, and consistency across NSPs, developers, and delivery partners.

Owner's Engineering & Assurance

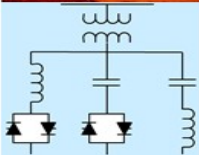
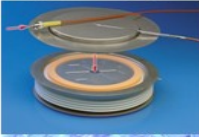
- ❖ High-risk, high-value project oversight Design assurance and verification
- ❖ Interface management across EPC, OEM, and network scopes
- ❖ Independent engineering review for financiers and owners
- ❖ Integration readiness and operations assurance

Training and Technical Uplift

- ❖ Specialist training in harmonics, voltage control, reactive power management, and STATCOM/SVC technologies and projects
- ❖ Capability building for Network Service Providers and developers in power system modelling and compliance assessment

Digital Substation and Network Strategy

- ❖ Advisory support for TNSPs on digital substation strategy and cost-optimised design
- ❖ Integration of digital engineering principles with HV substation asset strategies



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Team Biographies

Dr Tuan Vu : Executive Director | Power Systems Planning & Modelling

Tuan Vu is the Practice Lead / Principal Consultant for Power System Modelling, bringing over 29 years of experience across Australia's electricity supply industry with a career anchored in transmission network planning, HV/EHV substation design, and power system analysis. Tuan is a recognised industry leader in integrating both synchronous and inverter-based generation into the National Electricity Market (NEM).

Tuan's expertise spans the full lifecycle of connection and system modelling - covering power system harmonics, system strength, transient stability, and control interaction studies. He has led Generator Performance Standard (GPS) investigations, harmonic compliance studies, and commissioning strategies for major renewable energy, gas peaking, and hybrid projects throughout Queensland, New South Wales, and Victoria.

Tuan has contributed extensively to Renewable Energy Zone (REZ) development and integration, supporting Powerlink, and VicGrid in planning and technical readiness. Most recently, Tuan established and led VicGrid's planning and modelling functions during their transition from AEMO, providing strategic guidance on offshore wind integration and REZ transmission design. Tuan combines practical engineering depth with system-wide insight, helping project developers and network operator clients build robust models, validate performance, and achieve compliance confidence for both synchronous and inverter-based resources. (Key Expertise: System Strength & Stability, REZ Integration, GPS Studies, HV/EHV Substation Design, Harmonic Modelling, Renewable Grid Integration, SCADA & Secondary Systems)

Tuan is supported by Dr. Alan Lee and Dr Brian Tan



Team Biographies

Dr Alan Lee - Technical Director| Principal Consultant (Power Systems)

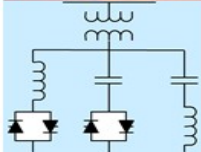
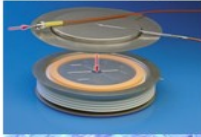
Alan Lee is a highly experienced Senior Technical Leader with over 15 years of expertise in power systems engineering and renewable energy integration across Australia and internationally. Holding a Ph.D. in Electrical and Electronic Engineering from Aarhus University, Alan brings deep knowledge of advanced control theory and power system dynamics, particularly for wind, solar, BESS, and synchronous machine projects.

Alan has led the delivery of complex grid connection studies and Generator Performance Standard (GPS) packages for major utility-scale projects, including gas peaking plants, synchronous condensers, hybrid solar-BESS systems, and large wind farms. His expertise spans control system design, model tuning, harmonic and power quality assessment, and compliance with the National Electricity Rules (NER). Recognised for his technical leadership, Alan provides technical direction and negotiation support to developers, OEMs, and Network Service Providers, ensuring successful project outcomes and streamlined AEMO and NSP approvals. (Key Tools: PSS®E, PSCAD, PowerFactory, MATLAB/Simulink, RTDS, Python)

Dr Brian Tan — Technical Director| Principal Consultant (Power Systems)

Brian Tan is a Senior Power System Engineer with more than 10 years of experience in power system modelling, renewable integration, and network planning across Australia and the Asia-Pacific. With a Ph.D. in Electrical Power Systems from the National University of Singapore, Brian brings a strong technical foundation in load flow analysis, dynamic studies, and grid compliance under the National Electricity Rules.

Brian has delivered detailed connection studies and control strategies for large -scale renewable and hybrid assets including solar, wind, battery energy storage, and gas peaking plants. His experience spans developing PSCAD and PSS®E models, preparing complete GPS packages, conducting NEM studies, and implementing automation for compliance testing and reporting. Brian's deep analytical capability, combined with practical delivery experience, ensures robust, standards-compliant outcomes for complex generation projects. Brian is a Certified Advanced User of PSS®E and PSCAD and has completed AEMO's Network Connections Training. (Key Tools: PSS®E, PSCAD, PowerFactory, MATLAB/Simulink, Python)



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Dr Tuan Vu – Practice Lead Power Systems Planning & Modelling



Dr Tuan Vu

Executive Director / Managing Director

Volt-Var and Control Power Systems

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Education, Licenses & Certifications

- PhD Power System Harmonics, UoW
- Master of System Engineering, QUT
- Grad Certificate Electricity Supply, QUT
- Bachelor of Electrical Engineering, UQ
- FIEAust - Fellow Institution of Engineers Australia
- RPEQ, CPEng, APEC Engineer, IntPE(Aus)

Memberships & Committees

- Member of IEC Standards Working Groups (TC57-WG10, TC38-GW37 and TC38-WG47)
- Member of Standards Australia (EL-013, EL-050 and EL-011)
- Member of CIGRE B4 and B4.92, B4.94

Dr. Tuan Vu is a highly experienced Power System Engineer with over 29 years of expertise in the electricity supply industry and energy consulting in Australia and internationally. He has extensive experience in HV and EHV Substation Design, National Electricity Market Connections, Power System Planning, Modelling, Design Studies and Analysis. He specialises in high voltage substation design, SVC and STATCOMs projects, power system harmonics, secondary systems, SCADA, and system integration of large and complex high voltage projects. He successfully led multi-disciplined design and commissioning specialists and delivered high-voltage capital projects worth over \$230M.

Relevant Experience

VicGrid Project Director Transmission Planning & Modelling. Lead a team of Power Systems (PSSE, PSCAD) and Economic Modelling (PLEXOS) Advise VicGrid, DEECA and VIC SEC on Energy Transition, Onshore and Off-shore Wind and Renewable Energy Zone Development in Victoria Central West Orana / New England REZ Harmonic Planning, WAMPAC Strategy, Asset Management and Maintenance Strategies for HV Plant Western Sydney Airport (WSA) Protection Coordination Studies.

Anglo-American Mining Company (AAMC) 66kV GIS Switching Station Establishment at Moranbah mines;

TransAlta Mt Keith and Leinster 132kV Extension, Solar and Battery Energy Storage System (BESS);

Reviewed and Advised on Mt. Emerald Wind Farm (180.45MW) Generator Performance Standards (GPS) reports.

Reviewed and advised on GPS, Full Impact Assessment (FIA), reports and System Strength Remediation schemes for various renewable connections overseas and in Australia, e.g. Dam Nai Vietnam (Phase I and II Windfarms – total 45MW), Bac Lieu Vietnam (Phase I Windfarm 99MW), Blue Grass Solar Farm, Haughton Solar Farm;

Conducted harmonic performance assessment for Boyne Island, including an investigation into equipment failures at Boyne Island.

Reviewed and advised on Mt Emerald Windfarm Frequency Sweep report; harmonic allocation to Mt Emerald Windfarm.

Audited the System Integrity Protection Schemes (SIPS), including under-voltage and under-frequency load shedding schemes, across Powerlink's transmission network.

Reviewed and advised on the North Queensland Wide Area Monitoring Protection And Control (WAMPAC) System Strength Mitigation schemes to accommodate a high penetration of Inverter-Based Resources (IBR) in North Queensland.

Investigated and advised on the applications and impact assessment for wide-area protection and control schemes (WAMPAC), system integrity protection schemes (SIPS), special protection schemes (SPS), emergency frequency control schemes (EFCS), or remedial action schemes (RAS).

Core skills & capabilities

Specialist technical skills in Power System Planning and Energy Modelling, including harmonics, Volt Var Optimisation, Power System Strength Assessment, Power System Fault Investigation and Expert Witness report, SVC and STATCOM projects, Testing and Commissioning, Substation Design Integration, SCADA, HV/EHV Secondary Systems, Asset Management and Digital Asset Strategies.

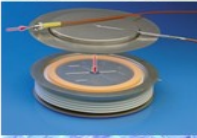


Project Experience



Voith (Snowy 2.0 - Due Diligence)

We were engaged to conduct due diligence on model parameter tuning and developed solutions to address GPS requirements for Voith Generators.



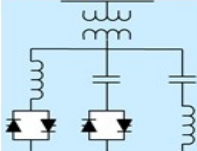
Generator Connection - Solar Farm (300+ MW) & BESS (50 MW)

Our team was engaged to develop power system models and control strategies for the integrated solar farm and BESS. We performed grid connection studies and GPS assessments using PSS®E and PSCAD, ensuring full compliance with the NER.



Generator Connection - Gas Generators (300 MW)

We were engaged to develop power system models and tune controls for gas turbines and multiple 3-winding transformers. Our scope included designing voltage control strategies for complex network configurations and operational scenarios, conducting GPS simulations, and contributing to the preparation of the full GPS package.



Confidential Project 397 MW Gas Generators (GE LM2500), QLD

Our team was engaged to develop functional requirements for FCAS and the plant operational controller, while ensuring the gas turbine's primary function of controlling voltage and frequency at its 11-13 kV terminals was preserved. We prepared the complete GPS connection package for the 5.4.3A application. We also led negotiations with OEMs and NSPs on plant performance requirements.

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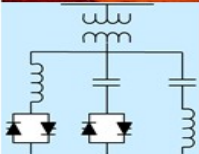
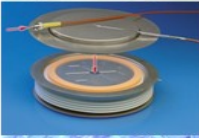


Confidential Project 70MVA Synchronous Condenser, NEM

Our team was engaged to develop and tune a PSCAD model and submit it to the NSP and AEMO for FIA and system strength assessments. We reviewed technical specifications to ensure compliance with connection and performance requirements.



Project Experience



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Harmonic Assessment, Filter Design and TNSP Due Diligence

Our team has undertaken harmonic assessments and harmonic filter design for multiple clients across QLD, VIC, and NSW.

We have also delivered harmonic due diligence studies on behalf of a TNSP.

Generator Connection - 190 MVA BESS Hybrid with 250 MW Solar Farm, NSW

Solar and BESS plants arranged in DCA/DNA architecture, connecting to one of the most complex areas of the NSW network.

Delivered the full GPS connection studies package (R0 and R1), reviewed performance and documentation, and negotiated performance outcomes to secure 5.3.4A and 5.3.10 letters.

Generator Connection - Solar Farm (~100 MW), QLD

We reviewed SMA inverter projects and settings across the NEM, optimising plant configuration.

We resolved long-standing model issues pending since the R0 stage. We delivered the full GPS R1 submission, achieving excellent client feedback.

Generator Connection - Wind Farm (1,300 MW), VIC

Our team was engaged as the technical lead to assess comprehensive GPS solutions for one of the largest wind farm projects in the NEM. We delivered high-quality and timely feasibility study grid packages, earning strong client recognition.

Generator Connection - Wind Farm (400 MW), NSW

We performed model parameter tuning, prepared the complete GPS package under tight deadlines and received highly positive client feedback on responsiveness and quality.

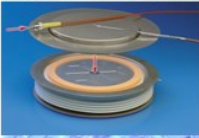


Project Experience



Generator Connection - Wind Farm (140 MW), NSW

We were engaged to conduct model parameter tuning and developed solutions to address GPS requirements.



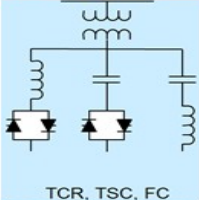
Generator Connection - Solar Farm (300+ MW) & BESS (50 MW)

Our team was engaged to develop power system models and control strategies for the integrated solar farm and BESS. We performed grid connection studies and GPS assessments using PSS®E and PSCAD, ensuring full compliance with the NER.



SVC and STATCOM Projects, QLD and VIC

We were engaged to conduct model parameter tuning and developed solutions to address GPS requirements.



Generator Connection - Wind Farm (390 MW (South) WF + 580 MW (North) WF) & BESS (400 MW, 4 Hrs - Grid Forming)

Led multidisciplinary teams of local and international consultants to undertake Generator Performance Standards (GPS) studies, OEM model evaluation, validation, and performance assessments.



Generator Connection - Synchronous Gas Turbines (100 MW), (30 MW) and (20 MW)

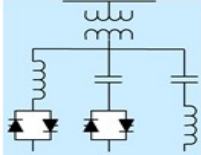
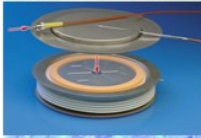
Our team was engaged to perform grid connection studies and GPS assessments using PSS®E and PSCAD, ensuring full compliance with the NER.



Project Experience

1 GW Data Center Connection in NSW

Engaged to deliver power system studies for a data centre development, including OEM model evaluation, performance assessment, and resolution of dynamic modelling issues to achieve compliance with grid connection requirements and applicable Generator Performance Standards (GPS).



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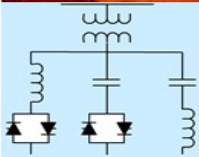
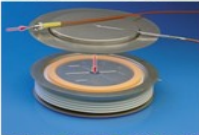


Client Feedback

“Quick and high-quality responses to questions and requests.”

“Speedy simulations and replotting of results when needed.”

“Most efficient team to get the job done by the target date.”



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