



Specialist Consultants
to the Electricity Industry

PSC NEWS

Helping our clients power the world



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Territory Generation ROC Project

Territory Generation is the major electricity producer in the Northern Territory of Australia and is responsible for the generation of electricity to power homes, industry and businesses in Northern Territory cities and towns.

It owns and operates power stations near Darwin (2), Katherine, Tennant Creek, Alice Springs, Yulara, Owen Springs and Kings Canyon. Territory Generation is currently in the process of completing a major project to achieve remote operations of all power stations across the Territory from a new single Remote Operations Centre (ROC).

Andrew Dunn is PSC's GM Major Projects and has extensive experience in the project management for the design and construction of high availability, high security data centres and control centres. Andrew is pleased to be working in the Project Director role for Territory Generation in Darwin for the establishment of this new facility.

Andrew, as the Project Director, is working in conjunction with Territory Generation and the vendor on all aspects of this project including design, contract management, business process change, installation, testing and commissioning. A significant project milestone was achieved in February when both the Proof of Concept (PoC) with Owen Springs Power Station and the graphics system Factory Acceptance Test (FAT) were successfully completed. Andrew is enjoying the challenge of this role and is leading a significant contribution to the successful delivery of this project.

PSC would also like to congratulate Andrew as he celebrated 40 years of full-time work

as a professional engineer in February 2017. Andrew started on the 1st February 1977 as a graduate electrical engineer with the State Electricity Commission of Victoria, Australia. Between 1977 and 1994 he worked in transmission design, construction and maintenance for high voltage electricity networks. From 1995 Andrew has specialised in the design, upgrade, operation and management of electricity and gas SCADA systems and Energy Management Systems. Well done Andrew.



Andrew Dunn (right) and Graham Wallace (TGEN Generation Controller) at TGEN HQ in the ROC during the Proof of Concept testing with Owen Springs, 1500km away

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PSC North America year in review

As PSC North America enters into the 10th year of operation after incorporation in the US and Canada, we reflect back on 2016 to thank our new customers and recognize the growing community of our longtime clients.

Customer feedback has been resoundingly positive, from the always-encouraging "PSC is great to work with" down to specific praise of our technical skills, including "PSC has improved the configuration and usability of our data modelling tools." In 2016, five new North American clients were added to the PSC family. What makes these new customers particularly interesting is that three of them are technology companies who have chosen to combine PSC's specialty consulting with their technology solutions to meet customer/market requirements. We are very pleased that 17 of our existing customers repeated business with PSC in 2016.

Due to increasing demand from our clients, the PSC team developed an EMS/DMS technical specification to assist clients with planning, vendor selection, and project implementation. Our clients also engaged PSC to conduct market research in the area of ADMS and Software as a Service. The PSC electricity markets team was active this year working with a technology partner to implement a cloud based, distribution feeder optimization solution using price based dispatch for both unconstrained and constrained modes of operation.

Working with our clients, we were able to achieve some impressive successes. In 2016, our operational technology specialists were engaged in a number of exciting projects. Along with our clients and partners we provided consulting services in the following project activities:

- EMS upgrade planning, program management, and integration
- EMS product comparison and recommendations
- HVDC integration into the EMS
- Energy storage integration with the EMS/DMS including energy scheduling and MESA based controls
- Multi jurisdiction EMS rationalization of models, displays, and operating procedures improving consistency and lower cost of operation
- DMS product testing, DMS application testing, and DMS requirements development
- EMS production support including database, displays, application updates, patch management

- Gas SCADA project management, integration, and technical support
- Grid Edge control system technical analysis

Our Power Networks team experienced growth with addition of three new team members and an office opening in Vancouver, B.C. The team contributed to a number of high profile activities for our customers including:

- FERC order 1000 studies
- Transmission line design review of competing designs
- Industrial Microgrid design and business case development
- Interconnection studies
- Network base case development

The HVDC business continues to be in high demand. The team assisted with many critical HVDC projects including:

- HVDC operations and maintenance support
- Owner's engineering on-site work for controls upgrade and added HVDC functionality
- Buy side due diligence for a potential HVDC asset purchase
- Technical support for HVDC project development including design, vendor submission review, and permitting
- HVDC expert witness on behalf of a consumer advocate

As we look forward to 2017, we are encouraged by our clients' continued vote of confidence with contract extensions, renewals and new contracts.

To our clients and partners,

Thank you for a very successful 2016 and we look forward to helping you power the world in 2017.

Sincerely,

Alex Boyd, President and CEO of PSC North America



Record Breaking DistribuTECH 2017

All About Sustainable Innovation

As new, capital-light entrants to the electricity market begin to offer customers increasingly attractive DER solutions, traditional players in the electric power transmission and distribution space are faced with the challenge of adapting to the shift in capital by providing new services for both traditional customers and these new market entrants.

For utilities, that means understanding the impact of the shifting marketplace on their business and on their customers, and having the foresight to prepare their business to ensure that customers always have access to safe, reliable, and affordable power.

Integration and management of Distributed Energy Resources (DER) remained a prominent topic at DistribuTECH 2017 in San Diego, California, where host utility SDG&E reported rapid growth in solar generation as well as battery storage development, such as the 37.5MW Escondido battery storage project being delivered by AES, which is billed as the largest of its kind in the world.

Utilities were eager for guidance and support around the integration and management of DER. PSC's experience with DER projects was a hot topic. Our work integrating battery storage with SCADA, to our involvement in market optimization for a DER pilot project built on an intelligent cloud, were of particular interest.

Amidst the enthusiasm around DER, PSC ran into many utilities interested in learning how to best leverage their existing technology, as well as seeking a sound framework and vision for the future of their Energy Management Systems, Distribution Management Systems, and Outage Management Systems.

PSC spoke with a number of utilities. For some, the business need was to get the most out of their current system, such as enhancing their

in-house system modeling capabilities. Utilities preparing to upgrade their system were concerned about balancing their needs for reliable strategic advice with streamlined support of their legacy systems during implementation.

DistribuTECH 2017 set all new records for attendance, with more than 13,500 visitors from 77 countries joining the conversation at the San Diego Convention Center. One notable difference was the high level of attendance by skilled professionals seeking new employment opportunities. PSC spoke with a number of industry veterans and technical experts interested in exploring alternative career paths.

DistribuTECH continues to provide a dynamic atmosphere for industry professionals and thought leaders to connect and contribute to the future of the grid. We look forward to seeing our business partners and industry peers in San Antonio, TX, for DistribuTECH 2018!



PSC Canada's new office



Pictured left to right "Anupama Konara, Marc Brunet-Watson, Roul Martin, Algon Meikle"

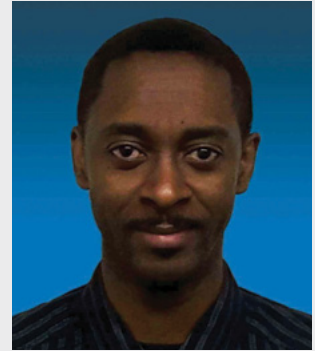
PSC's Vancouver, B.C. office is officially operational! The Vancouver office serves as the full-time home to PSC's Canada based system studies specialists. The Power Networks team continues to grow in North America, as our clients express confidence in PSC's ability to provide excellent support with system studies and system planning.



PSC WELCOMES NEW STAFF

ALGON MEIKLE

Algon Meikle is a veteran system studies engineer with more than 20 years of experience in the electrical power industry. Algon is highly skilled with using Power System Analysis software to conduct critical grid assessment studies and develop solutions to ensure grid stability and economic viability. He has assessed the integration requirements for distributed energy resource projects including solar PV systems. Algon is an expert developer of base cases, feasibility studies, impact studies, and interconnection studies to ensure reliable connection under fault conditions. Algon has joined the Power Networks group in Vancouver, B.C. where he will bolster our team of expert systems studies engineers supporting clients across North America.



MAAN AL ASAD

PSC welcomes Maan Al Asad who is a Principal Consultant with 20 years' overhead lines, civil and structural engineering experience in the power distribution, rail and power transmission fields. His strength is in the leadership of multi-disciplined teams of engineers and designers on complex infrastructure projects, and is also experienced in the construction phase supervision of overhead lines work.

Maan's other roles have included design reviews and approvals, client liaison and relationship management. He has worked on projects throughout Australia and New Zealand and will be based in the PSC Transmission Lines team in Australia.



PSC supports the 2017 Pioneer Epic Race

The 2017 Pioneer 7 Day Epic race is a 7 day mountain bike race from Christchurch to Queenstown along New Zealand's Southern Alps. In its second year, the event must be completed by teams of 2, with team members keeping within 2 minutes of each other throughout the entire race. Team PSC consisted of Stephen Butler, a PSC Engineer based in Scotland and Phil Murphy, a Marine Engineer on a boat for Paspaley Pearls off the coast of Darwin. It was Phil's idea to enter the race and Stephen didn't take much convincing to come over for the ride.

The race started off with a Prologue in Christchurch's new Adventure Park and then 7 days of very hard mountain bike racing

through some of the best scenery in New Zealand. Team PSC rode very well for the entire event and performed better every day, climbing the ranks in the general classification. The highlight was the podium finish on the final stage being the third team to finish, which left them in 8th position overall in the Pioneer and 5th in the Open Mens age-grade with a finishing total time of 29 hours 37 minutes for the 7 day event – a fantastic effort.

The team would like thank PSC for their sponsorship and helping to make this all possible. It was a journey and endurance feat of a lifetime.



Stephen Butler (L) and Phil Murphy

PSC NEW ZEALAND
PO Box 57095, Mana
Wellington
New Zealand
Phone: +64 4 232 7680
Fax: +64 4 232 7682

PSC AUSTRALIA
PO Box 2102,
Fortitude Valley BC, QLD 4006
Australia
Phone: +61 1300 933 632
Fax: +61 7 3252 8640

PSC NORTH AMERICA
PO Box 878,
Kirkland, WA 98083
United States of America
Phone: +1 425 822 8489
Fax: +1 425 822 3520

PSC ASIA
#16-01 The Amara
Corporate Tower
100 Tras Street
Singapore 079027
Phone: +65 9128 1830

PSC EUROPE
SoanePoint
6-8 Market Place
Reading RG1 2EG
United Kingdom
Phone: +44 7827 924 825



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