



Specialist Consultants
to the Electricity Industry

PSC NEWS

Helping our clients power the world



Issue 59 | July 2018

DER Advice to Regulators in California and Minnesota

Distributed Energy Resources (DER) including rooftop PV, batteries, and electric vehicles, are changing the way that distribution networks operate. Instead of the traditional power flow from network to customer, the power now often flows from the customer to the network. This reversal challenges the traditional design of the distribution networks, but also provides opportunities to run the networks more reliably and efficiently.

DER challenges include coping with network overloads, increased voltage fluctuations due to varying DER power output, and failure of protection systems. On the other hand, DER also presents opportunities to defer or avoid expenditure on network assets by providing alternative power supplies to the grid.

Electricity regulatory authorities in several states are trying to encourage distribution utilities to actively consider DER as a viable option when planning for network growth. Regulatory guidance is often necessary to handle the potential conflict of interest that arises because making use of customer owned DER does not expand the asset base and overall value of the distribution utility.

In California, PSC worked with the Regulatory Assistance Project to advise the California Public Utilities Commission on 2015 distribution resource plans and DER integrated capacity analysis submitted by Pacific Gas and Electric, Southern California Edison, and San Diego Gas and Electric.

In Minnesota, PSC worked with Lawrence Berkeley National Laboratory to advise the Minnesota Public Utilities Commission to review Xcel Energy's 2017 report on DER Hosting Capacity.

In both California and Minnesota, PSC helped the regulators with their understanding of the current DER technology and associated challenges and benefits. We were able to provide a view on global issues and trends on DER, and an independent and well informed opinion on the DER plans of the state distribution utilities.

Please contact our Director of Power Networks in North America, Marc Brunet-Watson on email: marc.brunet-watson@pscconsulting.com for further information on how PSC can advise on the integration of DER into distribution networks.

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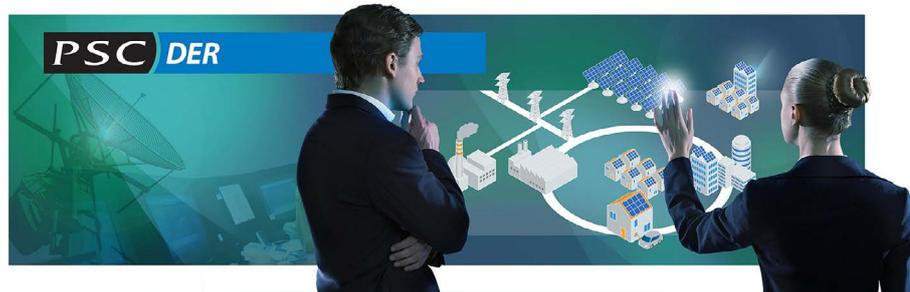
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PSC supports commissioning of world's first VSC Bipole HVDC link

HVDC's ability to send large amounts of electricity over long distances with low electrical losses has historically made it a technology of choice for long-distance bulk power transmission. HVDC, particularly VSC (Voltage Source Converter) technology, is increasingly the method of choice for overcoming the challenges associated with accessing remote renewable energy resources that require subsea electrical transmission and the interconnection of asynchronous AC grids, providing efficient, stable transmission and control capability.

PSC supported ABB with delivery of the Maritime Link Project, the world's first Bipole VSC HVDC link. The Maritime Link Project is a 500 MW high voltage direct current (HVDC) connection that will enable clean, renewable electricity generated in Newfoundland and Labrador to be transmitted to the North American grid in Nova Scotia.

Factory System Testing and Site Commissioning

PSC worked closely with ABB in the areas of factory system testing and site commissioning, through to system testing and final handover.

PSC assisted ABB with programming and protection testing. The site commissioning phase of the project involved assistance with testing coordination and planning, the commissioning of high voltage equipment into the ABB MACH 2 control and protection system and commissioning of signals to enable full station remote control.

PSC assisted ABB to successfully complete and document all agreed tests set out by the customer. Three PSC employees were located on site in Newfoundland, Canada for 6 months.

About ABB

ABB pioneered HVDC technology 60 years ago and has commissioned more than 120 HVDC projects worldwide. With over 20 years of operational experience, ABB's pioneering HVDC Light technology is used by 70 % of all the VSC HVDC links in the world.

Why did ABB choose PSC?

PSC is a leading engineering consultancy in the field of HVDC electric power transmission. Since the company was established in 1995, our HVDC experts have offered proven experience and hands-on operational knowledge with both VSC and conventional LCC thyristor-based converter technologies. PSC continues to support clients on all types of HVDC projects across the world including transmission interconnections, back-to-back links and offshore wind connected HVDC systems.



Maritime Link switchyard equipment at Bottom Brook substation

Ross Crust - Welcome back

PSC is pleased to welcome back Ross who is re-joining PSC in Australia. Ross has extensive experience in the electricity industry with a strong background in project management and engineering for high voltage transmission line construction projects and aerial laser survey (ALS) projects.

Ross has worked on numerous national and international projects and as part of our Transmission Lines team, will be working as a project manager for transmission lines projects in Australia.



CIGRÉ 2018

- from PV Arrays to ... 'Parlez Vous Francais?'

The CIGRÉ 2018 General Session is expected to bring in more than 3000 delegates and 6500 exhibition visitors to the Palais de Congrès, in Paris, France this August. CIGRÉ 2018 marks the 47th biannual General Session of the international conference on Large High Voltage Electric Systems.

The General Session will tackle contemporary issues facing the electricity industry, including the challenges posed by the proliferation of distributed energy resources (DER).

As a leading provider of solutions and support for the electricity industry, PSC will be represented by several key staff at CIGRÉ 2018. PSC's Dr. Zia Emin will chair the Study Committee C4 General Discussion Meeting at CIGRÉ 2018 in Paris, France, this August. Dr. Emin is joined by several other principal engineers and senior leaders of PSC.

Get to know them here, before you bump into them there!

Who to meet at CIGRE 2018



ZIA EMIN

Dr. Zia Emin is the Chairman of Study Committee C4 – Power System Technical Performance. As Chairman, Zia is responsible for leading the C4 General Discussion Meeting at CIGRÉ 2018, which will include a presentation of the scope of the committee and its current work, a discussion of the papers pertaining to several “preferential subjects” identified by the committee this year, and finally a General conclusion of the meeting. Zia has been Chairman of Study Committee C4 since 2016.



VICTOR TAN

As a Special Reporter of Study Committee D2 – Information Systems and Telecommunication, Victor Tan is responsible for reviewing papers relevant to the Group Meeting, and drawing up a synthesis deemed the “Special Report.” The application of information and communications technology to microgrids and DER will be one major topic of the D2 Meeting this year. The Special Report will be freely accessible on the CIGRÉ website.



TIM MILES

Tim Miles is the General Manger of PSC UK/Ireland, currently working to expand PSC's services for customers in UK and Ireland. Tim was a Special Reporter for Working Group B4-56, which addressed guidelines for extending the life of existing HVDC systems. This culminated in a brochure that recommended considerations that should be given to a DC grid code of the future.



GEOFF LOVE

Geoff Love is a Principal HVDC/Studies Engineer with PSC. Geoff is an active member of CIGRÉ, and was involved in the B4-77 Task Force, which set out to identify AC system fault response options for VSC HVDC converters. Geoff has supported transmission owners with planning studies and commissioning for numerous HVDC projects in the UK and Ireland.



ALEX BOYD

Alex Boyd is the President and CEO of PSC Group. Alex has 25 years of experience in the electricity industry, where he has held leadership roles in the Transmission and Distribution space across New Zealand, Australia and the United States. Alex has an MBA from the Tuck School of Business at Dartmouth. Alex founded PSC North America in 2007.



TONY ARMSTRONG

Tony Armstrong is a Co-founder of PSC and member of the Board of Directors for the PSC Group. In the early years, Tony was the driving force behind business development, focusing on company strategy, global management, and expansion. A leader and a mentor in the electricity industry, Tony holds a directorship with the CIGRÉ National Council in Australia.



Keith Fisk celebrates 20 years of Excellent Service with PSC

PSC congratulates Keith Fisk who recently achieved a significant milestone in completing 20 years of excellent service with the company. Keith has had an extensive career in the electricity industry and initially worked on hydro power station design where he specialised in control systems, instrumentation and telemetry systems for the remote control of power stations. This included working on many of the power stations across New Zealand.

Keith also had a heavy involvement in project managing substation SCADA projects for the New Zealand National Grid and has also worked on several control system projects associated with the New Zealand HVDC Pole 2 upgrade project in 1990.

In 1998 he joined PSC and has worked on a wide variety of projects for our clients and in many cases, has been the PSC design lead. Several of these projects include:

- ▶ HVDC fast runback scheme in NSW Australia
- ▶ HVDC "Special Protection Scheme" implementation review
- ▶ Power Station revenue metering design and configuration
- ▶ Traction SCADA RTU replacement for a regional rail programme
- ▶ Design of systems for grid frequency and synchrophasor measurement with PI
- ▶ Power Station PLC program design for ventilation system automation

Keith is also working on our solar charging and electric vehicle project – one of PSC's initiatives in the renewable energy sector. The PSC management team would like to thank Keith for his dedication and excellent service over the past 20 years.



Keith Fisk (R) celebrates 20 years with PSC Co-founder Tony Armstrong

PSC at the 2018 ENA Conference in Australia



PSC Australia Controls Manager Warren Young (L) and PSC Co-founder Tony Armstrong (R) at the PSC booth at ENA 2018

Energy Networks Australia (ENA) is the national industry association representing Australian electricity networks and gas distribution businesses. In June the biennial ENA Conference and Exhibition was held at the International Convention Centre in Sydney, Australia.

PSC was pleased to be an exhibitor at this conference and had a team available to discuss the changes and transformation of the electricity industry. PSC is working with our clients on Distributed Energy Resources (DER) projects to design, operate and optimise their DER. These clients have access to our full spectrum of specialist skills required to meet the challenges and benefits of DER.

Our staff at the conference were also able to outline several innovative projects that PSC has been working on with our industry partners and clients across the world.

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