



Specialist Consultants
to the Electricity Industry

PSC NEWS

Helping our clients power the world



Issue 44 | July 2015

PLANNING FOR A NEW FUTURE

For the fifth year running, PSC was again the 'Major Sponsor' of the 2015 Electricity Engineers Association Conference (EEA) in June. We see the renewal of this sponsorship as a very positive way to support the New Zealand electricity sector.

This year, our major sponsor status is important for another reason; it provides an ideal platform to launch PSC's drive into renewable energy advisory services.

The renewables sector is a strategically important industry development area. Current growth projections show that, by 2050, there will be over two billion cars on the roads of the world. This massive growth in the global vehicle fleet is a reflection of a population that will top nine billion, with six billion people living in urban centres. This presents massive challenges for energy use, with demand estimated to grow above current requirements by a staggering 100%.

It's time to imagine a new future. Therefore, PSC will undertake an innovative series of initiatives to promote renewable systems and technology, thereby staking out a thought leadership position in the New Zealand utility sector.

A leadership position will enable PSC to grow at home and will also help us to develop our business further afield in North America and Europe. But, as PSC Chairman & Co-founder Tony Armstrong explains, there is also a bigger picture. "If we look at renewables technology with the traditional economic model, we won't see its value. My challenge to other companies out there is to embrace this change and see its social value and develop their own solar arrays and EV charging stations."

PSC launched its first initiative at the EEA conference, focusing on electric vehicle developments and infrastructure uptake, using our own solar powered e-tron and solar array at PSC's office in Tawa, Wellington.



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PSC'S TIM BROWNE SELECTED TO PRESENT TECHNICAL PAPER AT CIGRE CANADA 2015

Consistent with our commitment to staff development and information sharing within the electricity industry, PSC has renewed its Diamond Sponsorship at CIGRE Canada 2015. PSC's appearance this year will feature a technical presentation by PSC power systems engineer Tim Browne, who is presenting a paper on the impact of distributed energy resource penetration on quality of supply in an Australian distribution system.

You can see Tim's presentation live at the conference, which is held in Winnipeg, Manitoba, Canada from the 31st August to the 2nd September.

The paper describes an investigation which was carried out to assess the likely impact of increasing distributed energy resource penetration on quality of supply in an Australian distribution system. Aware of the increases in DER penetration, the distribution network operator sought a quantitative study to determine DER penetration levels at which quality of supply violations could be expected, potentially requiring mitigation investments. In line with the particular regulatory arrangements in place, the investigation focused on three specific quality of supply parameters: steady state voltage regulation, voltage unbalance, and voltage fluctuations.

The CIGRE Canada Conference presents a wonderful opportunity for Canadian electricity industry participants and partners to attend a forum for the exchange of technical knowledge and ideas in the area of power systems. PSC happily encourages our industry peers to engage in this year's event, which tackles the theme, "What's next for the Power Grid?"

For more information about CIGRE Canada, visit their website at <http://www.cigre.ca/2015/en/>

If you are unable to attend the conference, but are interested in more information related to the paper, PSC may be able to arrange a private presentation of the study. Please contact Marc Brunet-Watson, Director of Power Networks – marc.brunet-watson@pscconsulting.com



PSC NEW ZEALAND - 20 YEAR ANNIVERSARY



PSC New Zealand celebrated its 20 year anniversary in May 2015 with a Formal Gala Dinner where everyone enjoyed a great evening.

PSC: ADVANCING THE INDUSTRY FOR 20 YEARS



In today's ever-changing electricity environment, maintaining the reputation as a leading power systems consultancy is no easy task. Yet for 20 years, clients around the world have relied on PSC for long term services to assist in the management of day to day operational challenges as well as planning for the future.

What sets PSC apart? The ability to see the road ahead. One of PSC's key strengths is the ability to anticipate the direction of the market, and invest in the expertise and knowledge of innovative technologies and business practices. Relying on this commitment to evolution, PSC has grown from a single office in New Zealand to 13 offices with 5 regional headquarters around the world, nearly tripling its staff size over the last decade.

PSC has served over 150 clients on 5000 projects – from optimizing networks in Australia and New Zealand; to facilitating the green revolution through innovative HVDC solutions in Europe; to designing and supporting control and market systems in the United States and Canada, and everywhere in between.

Due to increasing influence of environmental, regulatory and technological factors, today's electricity industry environment is evolving at a rapid pace. PSC has been at the forefront of major technological advancements in grid operations, including VSC HVDC, FACTS, SVCs, PMUs, and power electronics, and is a leading proponent of renewable energy solutions. Below are just a few examples of how PSC is advancing the industry:

- **Control Scheme Design**

PSC assists utilities around the world with control scheme design and optimization, having recently contributed to the control scheme redesign at Grant County PUD in Washington State, USA. The project improved the PUD's process in the monitoring of all hydro operations in the Mid-Columbia region.

- **Renewable Energy Solutions**

Today's grid is powered more and more by renewable energy - wind, hydro, sun, and geothermal. PSC is helping our clients adapt to this changing environment. From assisting our clients with the integration of energy storage, such as batteries into grid management operations, to connecting wind power to residential water heaters, PSC is helping our clients power the world with safer, more reliable and economical solutions.

PSC's system planning team is tackling the issue of PV penetration, conservation voltage reduction, and distributed energy resource management to help our distribution generation clients plan and operate the grid as never before.

- **Innovative HVDC Solutions**

Members of the PSC HVDC team held significant roles in the implementation of the earliest commercial VSC systems and we are currently working on multiple HVDC projects across the world.

- **Merchant Transmission Developers**

The regulatory and technological evolution of the industry is leading to a more diverse set of players contributing to the development of the grid. PSC provides strategic and technical support to independent transmission developers to advance the development of electric power transmission solutions. PSC provides value to developers from the concept of a transmission interconnection, through each phase of project testing and throughout the life of the project.

- **Project & Vendor Management**

Utilities approaching complex projects involving advanced technology often benefit from PSC's project managers who are familiar with the vendor and the system architecture – PSC provides project management services for control system projects around the world.

Honoring Commitment to Excellence

PSC extends its sincere gratitude for the business of all PSC customers over the last 20 years and looks forward to working with them for many more years.

ALLAN DAWSON, IMO - "The IMO would like to congratulate PSC in reaching its 20th anniversary and looks forward to maintaining the excellent technology partner relationship we have shared over the last 7 years. PSC has been at the technological forefront of the IMO's energy market reforms with the implementation of market systems that supported our new competitive Balancing Market in the Wholesale Electricity Market, and the implementation of WA's Gas Bulletin Board systems that brought transparency to the domestic natural gas market. PSC has consistently worked with the IMO to deliver a quality service to our marketplace and our stakeholders."

DAVE CARLSON, EMC - "PSC has assisted EMC with ongoing support of the National Electricity Market of Singapore's market clearing engine (MCE) since the market's opening in 2003. The technical expertise provided by PSC continues to be instrumental to the operation of a transparent and competitive electricity trading platform in Singapore."



PSC WELCOMES NEW STAFF

ADITYA TULI

PSC welcomes Aditya ("Adi") Tuli to the Melbourne Operational Technologies team in Australia. Aditya Tuli is a Distribution Management Systems (DMS) and SCADA/Software Engineer with over 8 years' experience with real-time systems and high availability applications in the utility operational technology sector. Across multiple roles, Adi has gained broad knowledge and experience of various DMS products. Adi's roles as a DMS Software Engineer (GE Energy), electricity distribution, gas distribution and transmission (AusNet Services), power generation (Hazelwood Power), water distribution (South East Water) and Alinta Asset Management (now Jemena) provide Adi with a valuable knowledge of different utilities.



KENT MARTIN

PSC welcomes Kent Martin who has joined the HVDC Group. With extensive experience in substation design for the high voltage electricity industry, he has worked on projects across New Zealand including upgrade projects for the Central Park substation in Wellington and the Manapouri power station switchyard in the South Island. In 2007, Kent joined the Transpower New Zealand HVDC Pole 1 replacement project team planning for the new Pole 3 thyristor valves and new substation equipment, and then as HVDC Technical Manager – Substations where he had the technical oversight of the substation construction for the HVDC Pole 3 project at Haywards and Benmore converter stations and the cable stations. Kent will be working for our HVDC clients in Europe.



KWAME ANDOH

PSC North America welcomes Kwame Andoh - an accomplished, forward-thinking electrical engineer with a diverse background and more than sixteen years of experience in the energy delivery industry. Kwame has joined the Power Networks team in Westborough, MA, USA as an expert in network modeling, simulation and planning. Prior to joining PSC, Kwame held transmission planning roles at both ISO New England and ERCOT in Texas. His rich background in the industry is a great asset to PSC's rapidly expanding Power Networks business.



MICHAEL NEWTON

PSC welcomes Michael Newton who has joined the Power Networks team in Europe as an electrical engineer. After completing a Bachelor of Engineering degree from the University of Canterbury in New Zealand, Michael joined the Transpower New Zealand graduate program before joining their Stations group in 2011. He is a competent, client focused substation project engineer and has a diverse knowledge on primary and secondary equipment, communications, metering and protection systems. His strengths include conceptual design, options analysis and the resolution of technical queries, and he has worked on a wide range of substation projects across New Zealand. Michael will be based in our Reading office in the United Kingdom.



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