



Specialist Consultants
to the Electricity Industry

PSC NEWS

Helping our clients power the world



Issue 46 | November 2015

PSC assists EirGrid in a HVDC Technical Advisor Role

EirGrid is a state-owned company that manages and operates the transmission grid across the island of Ireland. EirGrid published its Grid25 strategy for the development of Ireland's electricity grid. The Grid25 strategy is intended to meet Ireland's forecast demand growth to 2025 with a reliable power supply and to also facilitate the connection of renewable energy to support the European Union's 2020 climate change target.

A significant part of the Grid25 strategy includes a new project 'Grid West'. The Grid West project is a significant addition to the electricity grid. EirGrid developed this in response to growing plans in the North West for renewable energy generation. This project is also an opportunity to attract industries with a high-demand for electricity to this region. They recently published a report to an Independent Expert Panel with three options for delivering this project. They are an underground cable option, and overhead line option, and a third option that combines both technologies.

PSC tendered for and was selected by EirGrid as the HVDC technical advisor to facilitate EirGrid's report to the Independent Expert Panel on the underground HVDC option.

PSC's HVDC team is involved in all aspects of HVDC development, from the theoretical through to hands-on. PSC provides specialist advice for the full spectrum of requirements, including concept, specification, engineering and design, manufacture, construction, installation, commissioning, and operation.

This experience covers both Line Commutated Converter (LCC) and Voltage Source Converter (VSC) technologies.

PSC worked with EirGrid to provide expert technical advice to assist in the detailed consideration and assessment of the application and deployment of HVDC technology for electricity transmission projects. This included advice on the optimum HVDC technical solution for major projects, support for the preparation of the technical documentation required for this assessment and advice on relevant HVDC considerations in conducting the required analysis.

The PSC technical report was submitted to EirGrid and has been included in the report to the Independent Expert Panel and is now published. More information on the project can be found on their website:
<http://www.eirgridgroup.com/the-grid/projects/grid-west/the-project/>

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1Energy Systems/Snohomish/PSC Battery Energy Storage

In 2013 the State of Washington (USA) appropriated funding for creation of the Clean Energy Fund to expand clean energy projects and technologies statewide. Of the \$36 million allocated to the Clean Energy Fund, \$15 million was appropriated to Smart Grid Grants to fund competitive battery energy storage system projects to improve the reliability of intermittent renewable and distributed energy through energy storage and information technology including the ability to dispatch energy storage resources from utility control rooms. Three contractors were awarded grants to support battery storage projects, including Avista Utilities, Puget Sound Energy, and Snohomish PUD.

PSC has partnered with Seattle-based energy storage software vendor 1Energy Systems and Snohomish PUD in Washington State, to deploy a one-megawatt battery energy storage system based on Modular Energy Storage Architecture (MESA) and the 1Energy Distributed Energy Resource Optimizer (DERO).

MESA is a set of nonproprietary design and connectivity standards developed by an industry consortium of electric utilities and

technology suppliers that intends to provide a scalable approach for energy storage control system integration and optimization. DERO provides the user interface and resource optimization for the scheduling of the distributed resources.

PSC's expert Operations Technology engineers are providing conceptual design and system integration services to allow for the communication between the SCADA system

and the MESA based 1Energy Intelligent Controller™. PSC will also provide the integration between the SCADA system and the 1Energy DERO system.

TACOMA PUBLIC UTILITIES ICS ASSESSMENT

PSC has been awarded a contract to assist Tacoma Public Utilities (TPU) in assessing its Industrial Control Systems (ICS) Security Controls. This effort is designed to develop the assessment criteria for TPU's currently identified Industrial Control Systems as well as equipment providing connectivity to those systems.

As part of the engagement, PSC is developing processes and procedures for ICS assessment. PSC's Operations Technology group is ideally suited to perform this work based on our industry expertise and experience working with utilities, grid operators, and developers throughout North America and around the globe. The work will be utilized by TPU to assess OT equipment and is based on the



From left, Frank Kendall and Philip Jap of PSC; Zachariah Tanko and Terry Gifford of Tacoma Public Utilities

overlay concept recommended in NIST SP/800-53r4 as specified in NIST SP.800-82R2. The OT equipment involved ranges from typical network equipment such as router, firewalls, and switches to Energy Management Systems, SCADA, DCS and PLCs.

The results of the work will enable TPU to subsequently catalogue the security controls and support TPU security management and compliance procedures. The assessment criteria incorporates requirements from NERC CIP V5, FIPS PUB-199, and ISO 27001:2013.

PUGET SOUND ENERGY IT & PSC TEAMWORK CELEBRATION LUNCHEON

PSC sponsored a celebration lunch for Puget Sound Energy (PSE) to recognize the team effort of many PSE IT groups and the PSC team in achieving major and challenging milestones on multiple Energy Control System projects in the areas of Electric PI, Gas PI, and Gas SCADA platform. The BBQ lunch was held at PSE's Redmond West Facility in Redmond, Washington, USA. Approximately 40 people attended with a strong contingent of PSE and PSC Project staff, and some of the management team from both organizations.

George Hendrickson (PSE), Control Systems Manager and Ellis Gentle (PSC), Project Manager, presided in congratulating PSE's IT team on the success of coordinating multiple PSE IT Teams in delivering multiple Energy Control Systems projects on schedule. Specifically the team stood up an infrastructure to support: SCADA functions and enhanced situational awareness for Gas Operations; real-time historical data collection for Gas and Electric Operations; and improved security and reliability using a virtualized environment.

Rex Pietzyk (PSE – Director, IT Application Security Services) and Alex Boyd (PSC North America President) each thanked everyone for working together and overcoming challenges to meet the milestones. Alex noted the long list of contributors and acknowledged how this spoke to the complexity of the projects and a strong team. He also commented that the strength of a team is how they respond when things deviate from the plan. In this case, "the team rallied and met the milestones on time, the true measure of a team – well done."

As one of the project sponsors, Rex expressed that he "was very impressed with how all the different groups within the PSE IT organization and across many departments pulled together to make this happen." He also recognized and thanked PSE's project partner, PSC for coming

in and supporting them effectively. Alex Boyd thanked PSE for putting their trust in PSC to help get these complex projects completed.



SUCCESSFUL MARKET SYSTEM UPGRADE AT TRANSPOWER NEW ZEALAND

With extensive planning and preparation led by Transpower, the System Operations, IST and HVDC project teams, which included Jeff Cowley and David Schwartzfeger from PSC, have successfully delivered some significant changes to the HVDC modelling in the Market System. The work involved new HVDC System Operations Security Tools to improve operational procedures and included updates to several market system applications.

Jeff Cowley, a PSC Market Systems Engineer

was one of the key resources in providing technical market systems expertise and advice for the upgrade of the Market System, including assisting with extensive testing and analysis. David Schwartzfeger is a PSC Senior Software Engineer and provided development and technical support for the market system applications that were upgraded as part of the project.

Jeff and David both have over 25 years of experience in the electricity industry, with

Jeff focusing on SCADA systems, database application development, and support for the New Zealand Wholesale Electricity Market System. David has specialised in the development and testing of applications for Wholesale Electricity Market Systems.

The hard work by the entire team resulted in a successful project implementation and supports Transpower's future market system initiatives.



PSC WELCOMES NEW STAFF

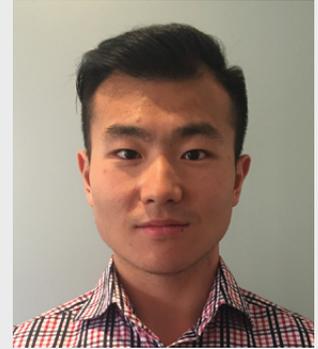
PAMELA MUNOZ

PSC welcomes Pamela Munoz who has joined the Power Networks team in Australia. Pamela has completed a combined degree – Bachelor of Petroleum Engineering and Civil and Structural Engineering (Honours) at the University of Adelaide. Throughout her final year at university, she was an intern engineer for Baker Hughes Limited – Wireline and Baker Oil Tools division. Pamela has experience in PLS-CADD and AutoCad, and will be working as a Junior Civil & Structural Engineer in our Transmission Lines engineering group in Adelaide.



FRANK YAO

PSC Australia welcomes Frank Yao to the Power Networks team. Frank has completed a Bachelor of Civil and Structural Engineering (Honours) at the University of Adelaide and is knowledgeable in the areas of civil engineering design, site construction, project quality and assurance control. He worked on Bolivar HDPE concrete lining WWTP, UGL/CH2MHill Ichthys Onshore LNG Facilities CGRE Blow Down Drain and Santos GLNG QLD project. Frank has experience in PLS-TOWER, SpaceGass and is able to utilize these skills he has attained through his studies and industry experience as a Junior Structural Engineer with PSC.



MIKE DE LEEUW CELEBRATES 10 YEARS OF EXCELLENT SERVICE WITH PSC

Mike de Leeuw is a SCADA/EMS Engineer and recently completed 10 years of excellent service with PSC. Since joining PSC, Mike has been providing SCADA/EMS (Energy Management Systems) services to our clients including Transpower New Zealand. This work includes technical support, system modelling, HMI development and data

commissioning. He has also assisted the System Operator with operational real time analysis. Mike has shown dedication to his project and support activities and the PSC management team would like to thank him for his commitment and exemplary service over the past 10 years.



PSC Group Chairman & Co-founder Tony Armstrong (L) presents 10 year certificate to Mike de Leeuw

PSC SCHOLARSHIP FOR 2015

Power Engineering Excellence Trust (PEET) and Electric Power Engineering (EPE) Centre combine with the New Zealand University of Canterbury Electrical Engineering School and students to host an annual R+D Expo. PSC attends this day as an EPECentre partner and also as the sponsor of the PSC Scholarship.

This PSC Scholarship was established in 2005 by PSC with the support of the EPECentre, as a way to recognise academic achievement by undergraduate students pursuing courses in Electric Power Engineering. The scholarship

attracts some very high calibre candidates and was indeed the case again this year. Mitchell Graham was awarded the PSC Scholarship this year with excellent academic achievement combined with a strong focus on practical work experience. Mitchell is also involved in an interesting project where the university is repowering a 4WD vehicle with an electric motor for farm use. We wish Mitchell and all the candidates every success in their pursuit of a rewarding career in the power industry.



PSC Group Chairman & Co-founder Tony Armstrong (L) and Mitchell Graham

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