NEWS AND VIEWS FROM PSC

Specialist Consultants
to the Electricity Industry

PSC NEWS

Helping our clients power the world

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Scottish Hydro Electric Transmission - Western Isles Invitation to Tender review

Scottish Hydro Electric Transmission (SHE Transmission) is part of SSE plc, a FTSE100 company which is involved in the generation, transmission, distribution and retail of electricity, and in the production, storage, distribution and supply of gas. SHE Transmission is the licenced owner of the electricity transmission network in the north of Scotland.

SHE Transmission is proposing to provide an electricity transmission connection between the Isles of Lewis and Harris and the Scottish mainland by a High Voltage Direct Current (HVDC) scheme. This HVDC scheme is intended to provide grid access for wind farm parks constructed on Lewis and Harris, and provide an alternative point of supply. In developing this project, SHE Transmission requested PSC to review and update an Invitation to Tender document for issuing to HVDC vendors.

The Western Isles scheme is a potential project that has been in existence for several years. PSC completed the review and update of the Invitation to Tender (ITT) document using PSC's HVDC technical knowledge and experience.

Aspects of the project performed by PSC included:

- Specialist HVDC technology advice on the ITT, including equipment specifications, studies specification, and AC/DC system interaction.
- Incorporating lessons learnt from SHE Transmission's other HVDC project currently under construction – Caithness-Moray.
- Integration of SHE Transmission internal standards, to ensure the Western-Isles project conformed with the standards of a typical SHE Transmission substation to avoid re-work.
- Producing an ITT that was vendor neutral.

All HVDC schemes are customised for the AC power systems that they interface with. Western Isles has a particularly complex interface, due to the Island AC network which contains both generation and residential load, and the low capacity parallel AC network. In writing the ITT, PSC was careful to clearly identify these interactions to enable SHE Transmission and the successful vendor to work together to produce a robust reliable scheme.

Scottish and Southern Energy Power Distribution

ALSO IN THIS ISSUE:

ActewAGL Teleprotection over MPLS

In April this year, PSC and ActewAGL have successfully completed the testing of Teleprotection over MPLS. ActewAGL owns and operates the electricity and gas networks in ACT, Australia.

The project involved the design of a MPLS network to carry Teleprotection traffic which PSC helped develop, as an extension to the successful rollout of ActewAGL's MPLS core which started two years ago, in which PSC assisted as well.

The trial was completed in Canberra Australia using the current MPLS equipment. The test involved the use of multi-vendor relays with protection test equipment as well as MPLS service activation test equipment. The test was a successful collaborative effort between ActewAGL's Business Systems Division, Networks Communications and Protection Engineering teams and PSC.

Testing being undertaken at an ActewAGL substation in Canberra. James Cole (L) – ActewAGL Secondary Systems Manager; Victor Tan (R) – PSC Principal Network and Security Consultant

PSC Review of California Public Utilities DER Hosting

PSC is reviewing the Distribution Resources Plan (DRP) documents issued by California utilities in response to the California Public Utilities Commission Governance Document. PSC is reviewing the proposed methodologies from distribution utilities to calculate Distributed Energy Resource (DER) hosting capacity and locational benefits. The constraints on hosting capacity include thermal, voltage, power quality, protection, and safety. Locational benefits include localized voltage support and resilience to network outages.

The DRP Guidance requires California Investor Owned Utilities to include three analytical frameworks in their Distributed Resource Plans, including an Integration Capacity Analysis, Optimal Location Benefit Analysis, and DER Growth Scenarios. Among the DRP filings being reviewed by PSC is San Diego Gas & Electric's (SDG&E) Integration Capacity Analysis, (ICA) which seeks to identify the DER hosting capacity on the SDG&E distribution networks.

The rapid evolution and proliferation of distributed resource technology demands that utilities and regulatory agencies work together to adapt to the increasing penetration of renewable energy at every level, from small household solar arrays to grid-scale wind farms, and everything in between. PSC's DER team provides vendor-neutral expertise to assist regulatory agencies, utilities, and technology providers in working together to advance distribution networks to ensure reliable electricity at the lowest cost.

PSC UK achieves ISO 9001 certification

The quality management system for PSC UK is now certified to the world's most widely recognised quality system standard, ISO 9001:2008. Key cornerstone concepts of the ISO 9001 standard include the requirement to demonstrate ongoing continuous improvement in the organisation, and the requirement to have a customer focus in the activities of the company.

In March Telarc SAI Ltd (PSC's external auditor) completed an audit at our Reading office in the UK. The assessment undertaken by Telarc was to determine the status and level of compliance of the management system against our internal requirements and those of the ISO 9001 standard.

This is an excellent outcome and ensures PSC's quality management system certification meets the requirements of our clients in the United Kingdom.

PSC Supports Investor Owned Utility with EMS Visualization, Electric PI, and Gas Control Upgrades

Over recent years PSC has provided cost effective and reliable project management and technical engineering client side support to a North American investor owned utility (IOU), including PI system upgrades for Gas and Electric systems, a Schneider Gas SCADA system upgrade, and implementation of GE Grid Solutions' visualization tool **e-terra*vision*.** Based on the successful outcomes and practical advice garnered throughout these projects, the utility has engaged PSC for a number of subsequent projects.

Electric PI Upgrade

PSC provided project management and quality assurance leadership for the Electric PI Historian Upgrade project, which went live in 2015 with a seamless transition for users. The upgraded PI system simplifies the solution architecture, while adopting a virtualized approach.

Gas Control System and PI Upgrade

PSC supported the utility through 2014 with project scoping, requirements definition, and vendor contract negotiations for the Gas Control Upgrade that officially kicked off at the end of 2014.

The utility's Gas Control System is based on the Schneider Electric (formerly Telvent) OASys Gas SCADA, and is extended through close integration with the utility's Gas PI system.

PSC has provided Project Management, Solution Architecture design, Quality Assurance, and technical implementation coordination within a large matrixed IT organization as well as integrated Gas Control system testing services. The solution design follows the utility's best-practices virtualization, Active Directory management, and IT support systems.

e-terra*vision* Implementation

Visualization of the electric grid is becoming an ever more critical capability for transmission utilities in North America. That point has been driven home by some of the major, multi-state, multi-utility blackout events that have occurred since the early 2000's. Responding to this need, the customer selected the **e-terra*vision*** product available from their current EMS vendor.

PSC project management and technical consulting staff were engaged to work with the utility's own EMS experts to execute the project all the way through to production cutover. PSC's experience with the client side requirements and business process provided valuable input to the project team and led to a successful project completion at the end of 2014.

Energy Imbalance Market

The Energy Imbalance Market (EIM) project will allow the company to enter the California ISO (CAISO) hosted energy trading market. The project encompasses developing a framework architecture used to interface systems from numerous departments with external vendor systems. PSC was contracted to design, implement, and test SQL interfaces both to and from internal utility systems and to the external vendor, Power Costs Inc. (PCI). These interfaces were being written in and tested using SQL Server Integration Services (SSIS) 2012.

EMS System Modeling Tool Replacement

For the EMS Modeling Tool Replacement project, PSC provided project management, testing, configuration management, Best Practices guidance and technical subsystem diagnosis services for the vendor-installed implementation of GE's **e-terra*source***. The EMS Modeling Tool upgrade project is an important subsystem dependency for the EIM because of the requirement to supply IEC 61970-552 (CIM/XML) models to CAISO representing the 90-day ahead future-state of the IOU power grid. Model releases from **e-terra*source*** for both CAISO and the IOU's production EMS are scheduled for go-live in May 2016.

EMS Modeling

Finally, PSC is assisting the IOU with EMS Modeling Backfill services. The utility was on a short schedule to replace a modeling and display building staff position while also transitioning to GE Grid's new EMS modeling tool. PSC's expertise in GE's **e-terra*source*** modeling environment is easing the go-live transition from the legacy EMS modeling tool while the IOU seeks a full time staff replacement.

PSC's capability to respond quickly and efficiently to a unique mix of service needs across a wide range of technologies and tools is helping customers respond to the dynamic demands of the electric utility industry, while effectively preparing for the future of the grid.

PSC WELCOMES NEW STAFF

ANUPAMA KONARA

PSC North America is pleased to welcome Anupama Konara, who joins PSC's Power Networks team as a System Studies Engineer and will be based in Vancouver BC. During her Ph.D which she completed at the University of Manitoba in Winnipeg, Anupama investigated how synchrophasor-based remotely measured signals in large-scale interconnected electrical power systems could be used to develop effective power system stabilizers. Anupama also had the opportunity to complete several internships at Manitoba Hydro focusing on power systems modelling during her university studies.

CHANDANA SAMARASINGHE

PSC Australia is pleased to welcome Dr Chandana Samarasinghe as a Principal Power Systems Engineer in the Power Networks team in Brisbane. Chandana joins us having held principal engineering positions in Victorian and national planning areas within AEMO since 2011. He also has extensive experience from engineering roles at the NZ Electricity Commission (now Electricity Authority) and Transpower New Zealand. Chandana brings a wealth of experience to the team in power system planning, analysis and modelling. He is a Registered Professional Engineer of Queensland and Chartered Professional Engineer.

PAUL CHANDLER

PSC welcomes Paul Chandler as a Senior Consultant. Paul has over 15 years of experience in the electrical power industry, and has specialised in SCADA/EMS and real-time software and systems. Most recently he has been providing strategic and technical direction by working with clients on tasks such as EMS asset management strategy and regional AGC roll-out project development. Paul's expertise in utility SCADA/EMS systems includes seven years of hands-on experience with Power and Water Corporation in Darwin, Australia, providing strategic leadership and coordinating the delivery of SCADA/EMS services and associated infrastructure. Paul will be based with the PSC Operational Technologies group in Australia.

Jeff Cowley celebrates 20 years of excellent service with PSC

PSC congratulates Jeff Cowley who recently achieved a significant milestone in completing 20 years of excellent service with the company. Jeff joined PSC as a Technical Specialist and specialises in applications development and support for the wholesale electricity market system.

Jeff has been involved in a large number of projects associated with the New Zealand wholesale electricity market system since joining PSC. He has worked as an analyst for the market system which included AIMMS-SPD solver support, functional requirements, technical management and the testing and implementation of market system updates. Jeff was also heavily involved in a major upgrade of the New Zealand electricity market system and most recently was a team member for the integration of the HVDC System Operator tools and HVDC commissioning requirements into the Market System.

The PSC management team would like to thank Jeff for his commitment and excellent service over the past 20 years – well done.

Jeff Cowley (L) and PSC Group Chairman & Co-founder Tony Armstrong (R)

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