ACCELERATING POWER APPLICATION DEVELOPMENT

~ by ~

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Tuesday, March 1 • 11:00 AM – Noon (PT) • ==TEAMS ONLY==

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OVERVIEW

PowerSimulator® developed by IncSys and PowerData uses the EPRI OTS developed under the supervision of Professor Anjan Bose. PowerSimulator® is used to train the System Operators for the world's most challenging power systems. These include: Iraq Ministry of Energy, Erbil Electricity, National System Operator (ONS) and major Transmission Operators in Brazil, Pacific Gas and Electric Company, San Diego Gas and Electric Company, Southern California Edison, Florida Reliability Coordinating Council, ISO New England, Saudi Electricity Company and Essential Energy Australia. The System Operators for these organizations have the world's toughest assignments including managing rotating outages in Baghdad, keeping the power and lights on for the stadiums for the Brazil World Cup and the Brazil Olympic Games, managing the public safety power shut offs to avoid California wildfires and keeping the power and the lights on for the annual Hajj.

PowerSimulator® is now the foundation for a Power System Application Framework (PSAF) that can be used by university, national laboratory, power utility and industry researchers to greatly accelerate power control application development. The DARPA and ARPA-E Technology Readiness Levels (TRLs) are used as a framework for developing real-time applications for supporting NERC reliability coordinators, balancing authorities and transmission operators. PowerSimulator® Models have been developed for the North American interconnections – Reliability Models from planning data and Switching Models from operating data with details of breakers and switching.

By working with appropriate industry non-disclosure agreements research teams can now have access to large scale operational models with large dimensions (e.g., 150,000 nodes, 50,000 breakers, 100,000 disconnects, 15,000 lines, 8000 transformers) and a very complete range of equipment types, bus configurations and parameter values. The PSAF visualization tools allow new software prototypes to be built directly and tested on such large-scale models without starting out with smaller models that have more limited equipment types and parameter ranges.

PowerSimulator® provides the services for model management and model visualization. The PSAF programs use the LINKNET™ structure for storing networks. The programs are highly compact and easy to understand. They are so simple that they can be translated to other languages and can be embedded as distributed processes. As one example, the LINKNET™ Topology Processer was originally develop with PSAF and it has now been adopted by PNNL for its Python based three phase Topology Processor.

BIO

Robin Podmore has received the B.E.E. and Ph.D. in power systems from University of Canterbury, New Zealand. He specializes in developing innovative businesses using dynamic learning activities, especially simulators, for knowledge capture and transfer. His company has trained system operators and trainers to operate the world's most challenging power systems. The IncSys Academy with its Digital Virtual Instructor has assisted over 300 veterans to start or advance their system operator careers with 90 different companies. He played a key role in the start-up and growth of ESCA, now GE Grid, IncSys and IEEE Smart Village Entrepreneurs in India and Africa. He is an IEEE Life Fellow and a member of the National Academy of Engineers.