



## FUTURE POWER GRID INITIATIVE

# Decision Support for Future Power Grid Organizations

## OBJECTIVE

The power system is both a network of physical infrastructure and a network of interdependent organizations. Clarity, consistency and accuracy in grid communication are critical for successful management of normal operations and contingency mitigation. Due to nested organizational ties, organizational structure and contexts can shape communication practices and norms. Thus, our research seeks to

- » characterize power grid operator communication
- » investigate organizational influences on intra- and inter-organizational communication, and
- » explore how these organizational factors shape grid communication successes and failures as well as grid reliability.

## APPROACH

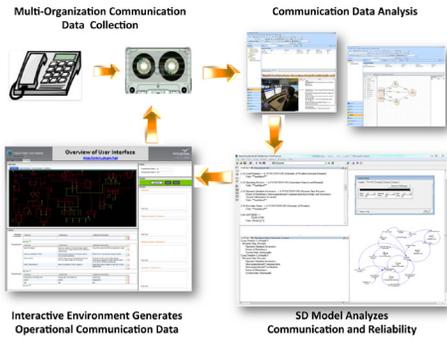
The project team

- » leveraged multi-disciplinary domain expertise and experience to identify decision support challenges and gaps
- » developed a prototype framework to enable online multi-organizational decision making and training
- » incorporated feedback from grid experts and industry throughout the development process
- » set up a game accommodating two transmission operators and one reliability coordinator.

The prototype interface has the capacity to display images of a grid event rendered by a dispatcher training simulator. The players represent collaborating organizations and are required to respond to simulated grid events, and document their decisions, justifications and the need for additional information. The decision-making and training framework equips operators with multiple chat functions to facilitate and document communication.

## IMPACT

During FY11 and 12, the project's investigators presented at NERC RCWG/ORS meetings, visited grid companies, and were provided with operational communication data. A key feedback from their visits highlighted the lack of economical training tools and the under-utilization of communication data to provide insight into areas of improvement for grid communication. To address these



important operational needs, the project will:

- » enhance the interactive decision-making framework toward the development of a flexible and economical training platform
- » support grid operations by utilizing available communication data to generate and share mission-critical analysis and insights.

## FOCUS AREA

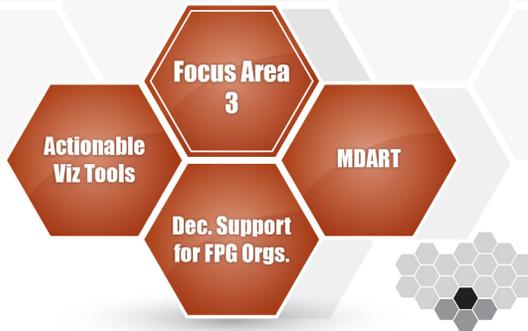
**Focus Area Three** aims to convert large amounts of model and sensor data into information and knowledge to support decisions in grid operation, planning, and policymaking. This area concentrates on the development of coordinated visualization interfaces and decision support capabilities in a modular, extensible software environment that can be used for both real-time grid operations as well as long-term planning. **Focus Area Lead:** Paul Whitney (paul.whitney@pnnl.gov)

## ABOUT FPGI

The Future Power Grid Initiative (FPGI) will deliver next-generation concepts and tools for grid operation and planning and ensure a more secure, efficient and reliable future grid. Building on the Electricity Infrastructure Operations Center (EIOC), the Pacific Northwest National Laboratory's (PNNL) national electric grid research facility, the FPGI will advance the science and develop the technologies necessary for meeting the nation's expectations for a highly reliable and efficient electric grid, reducing carbon emissions and our dependence on foreign oil.

## ABOUT PNNL

Pacific Northwest National Laboratory is a Department of Energy Office of Science national laboratory where interdisciplinary teams advance science and technology and deliver solutions to America's most intractable problems in energy, the environment and national security. PNNL employs 4,900 staff, has an annual budget of nearly \$1.1 billion, and has been managed by Ohio-based Battelle since the lab's inception in 1965.



For more information, please visit the FPGI website or contact:

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