



Pacific Northwest
NATIONAL
LABORATORY

Proudly Operated
by **Battelle** Since 1965



FUTURE POWER GRID INITIATIVE

Actionable Visualization Tools for Power Grid Situation Awareness

OBJECTIVE

Sustainable, efficient power grid operations rely heavily upon real-time information transparency and wide area situation awareness (SA) for all organizations in the power grid. This project addresses the fundamental need for greater SA through actionable visualization tools that:

- » increase the effectiveness of communication between organizations
- » support inter-organizational planning and problem solving efforts
- » integrate information from domains external to the power industry (e.g., weather) with power grid information so that organizations have a better awareness of events that can impact grid stability.

APPROACH

This project will support the need for external SA by

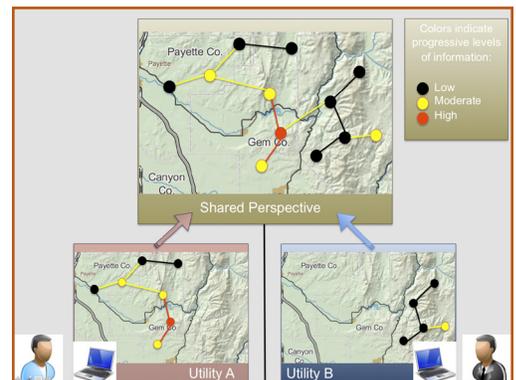
- » designing a new visual communication mechanism that will allow organizations to securely and flexibly share information across organizational boundaries
- » develop new visual analytic strategies that incorporate germane information from domains outside of the power grid: e.g., weather, political/social, cyber, etc.

This integrated functionality is supported through a new application called “Shared Perspectives.” This application is based on a scalable web architecture that supports a highly interactive collection of visualization components. This set of components will enable the rapid design of custom applications for industry use-cases.

IMPACT

Operators communicating across organizations often depend (exclusively) on telephones to create a foundation of common understanding. For non-critical situations, this communication medium is sufficient. During critical and complex events, however, relying exclusively on verbal communication can result in miscommunications that lead to incorrect assumptions about events and even disastrous consequences. The tools developed in this project will

- » broaden the conduit of communication between organizations through a common, shared visual perspective
- » allow organizations to flexibly share and build a common understanding of events through the secure sharing of information and visualizations.



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:

Luke Gosink
Pacific Northwest National Laboratory
(509) 375-6648
luke.gosink@pnnl.gov

Russ Burtner
Pacific Northwest National Laboratory
(509) 371-6736
russ.burtner@pnnl.gov

gridoptics.pnnl.gov



Pacific Northwest
NATIONAL LABORATORY

Proudly Operated by **Battelle** Since 1965