Understanding Interdependencies and Interoperability for Resilient Infrastructure

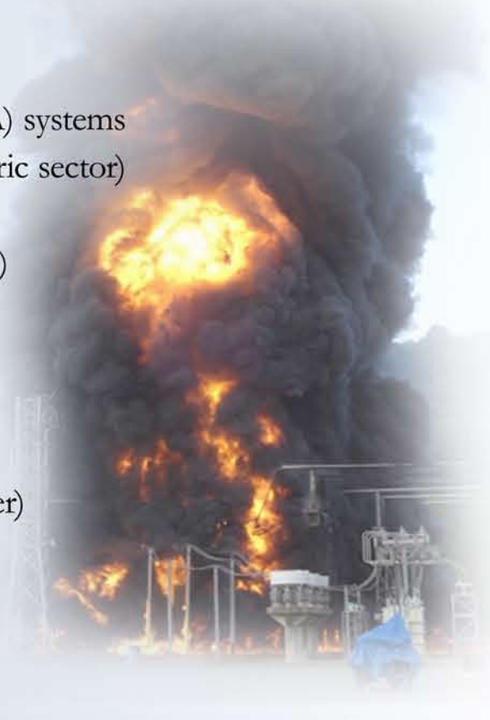
Challenge

- Provide interoperable voice, data, and video communications solutions to first responders
- Plan for, protect, respond to, and restore critical infrastructure
- Predict failures by understanding cascading effects of interdependent infrastructure
- Prepare and train for disasters based on realistic predictions
- Determine alternative actions before committing resources

National Laboratory Contributions

- Evaluation of emergent capabilities in interoperable communications
- Wireless test bed for full-scale testing and evaluation
- Airborne communications node for emergency communications and interoperability between all first responders
- Simulations of cascading effects of infrastructure failures
- Live, virtual, constructive simulations for realistic training
- National SCADA test bed for vulnerability assessments
- National response to cyber threats (US Computer Emergency Readiness Team)

Capabilities



Process Control Systems/Power Engineering

- Supervisory Control and Data Acquisition (SCADA) systems
- Relationship with equipment vendors (85% of electric sector)
- Link SCADA systems to real infrastructure
- Power-grid modeling (Real-Time Digital Simulators)
- Power-line test bed for full-scale evaluations
- Underwater acoustic detection for dams

Communications

- Low electromagnetic background
- Spectrum of capabilities (HF, Cell, Microwave, Fiber)
- NTIA experimental station status
- Tier 1 GSM Cellular Network
- True in-field, end-to-end testing
- Concepts of emergency/stop gap communications

Collaborations

- DOE National Laboratories
- Visualization Modeling Working Group (DOE-OE)
- Utility operators
- SCADA vendors
- Wireless vendors (e.g., Nokia-Siemens, Rivada)
- Government agencies (e.g., DOD, DOE, DHS)
- Regional (e.g., Fremont County, Idaho National Guard)
- Universities (e.g., Washington State, Idaho State, Boise State, University of Idaho, University of Washington, MIT, Penn State)

For more information, contact:
Northwest Regional Technology Center, http://nwrtc.pnl.gov/
Steve Stein, Director, steve.stein@pnl.gov, (888) 347-6983

Science-Based Solutions for Homeland Security