Cybersecurity for Energy Delivery Systems

2010 Peer Review

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ASAP SG

- **Outcomes:** Security profiles that provide guidelines for the secure deployment, design, and operation of smart electrical systems.

- **Roadmap Challenge:** Strengthen industry-government cooperation on issues of cyber-security in the energy sector and helps industry leaders to sharpen their business case for cyber-security investment by providing industry-approved guidelines for securing cyber-assets in a smart electric grid.

- **Major Successes:**
  - Security profile for AMI approved for official release by the Open SG Technical Committee.
  - Security profile for Third Party Data Access under review by the Open SG Technical Committee.

- **Schedule:** June 2009 – May 2011
- **2010 Level of Effort:** $400,000
- **2010 Funds Remaining:** $40,000
- **Performers:** Utilities, EnerNex, Inguardians, SEI, ORNL
- **Partners:** Open SG, industry funders and reviewers
Technical approach

• Project Description:
  – Utility-driven, public-private collaborative project to develop system-level security requirements for smart grid technology

• Needs Addressed:
  – Utilities: specification in RFP
  – Vendors: reference in build process
  – Government: assurance of infrastructure security
  – Commissions: protection of public interests

• Approach:
  – Architectural team → produce material
  – Usability Analysis team → assess effectiveness
  – NIST, SG Security → review, approve

• Deliverables:
  – Strategy & Guiding Principles white paper
  – Security Profile Blueprint
  – 6 Security Profiles
  – Usability Analysis
Mission: detailed requirements and best practices guidance for utilities procuring, implementing, and deploying smart grid technology
- Technology-specific, but vendor-agnostic
- Feed and accelerate SDO work (IEC, IEEE, NERC, etc.)

Participation
- 400+ Subscribers to various Listservs across 8 countries and 4 continents
- Broad mix of utilities, vendors, government, and academia
- SG Security Working Group and coordination with NIST
Collaboration: organizations funding this effort

- **DOE**
  - Matches utility contributions dollar for dollar

- **EPRI**
  - Funding through Tailored Collaboration (P161e Project)

- **North American Utilities**
  - Funding directly and through EPRI P161e/tailored collaboration
  - Funding utilities to date include
    - American Electric Power; BC Hydro; ConEdison; Consumers Energy; Florida Power & Light; National Grid; Oncor; Southern California Edison
Technology transfer: organizations using the ASAP SG products…
Next Steps

• Security profiles for
  – Advanced Metering Infrastructure  ✔ COMPLETE
  – Automated Data Exchange  ✔ COMPLETE
  – Distribution Management  ▷ UNDERWAY
  – Home Area Networks  □ PROPOSED
  – Wide Area Situational Awareness (Synchrophasors)  □ PROPOSED
  – Substation Automation  □ PROPOSED
Challenges ahead

- Compliance vs. engagement; risk vs. cost
  - “Standard must be auditable.”
  - “Security measures must be cost effective.”
    - Meeting regulatory requirements is a – maybe the - major concern of utilities
    - $$$s spent to implement a security measure are easily measured
    - $$$s saved by mitigating a security risk are almost impossible to measure
- Major issues raised by this challenge
  - The rate case
    - How much should energy consumers pay for a secure grid?
  - National security
    - How much should the federal government pay for secure grid?
  - Liability
    - How much should the utility pay for a secure grid?
- It is essential to have a secure energy system; how do we share the responsibility?