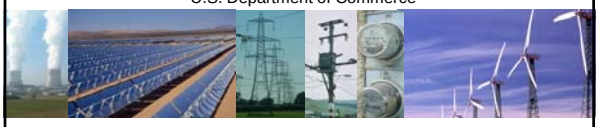
Overview of NIST Smart Grid Cyber Security Working Group

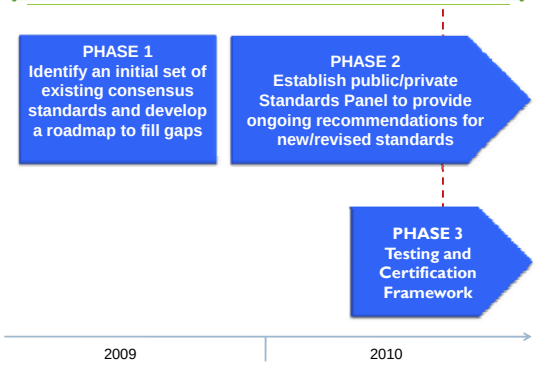
James St.Pierre
Deputy Director
Information Technology Laboratory
National Institute of Standards and Technology
U.S. Department of Commerce



Energy Independence and Security Act

- In the Energy Independence and Security Act (EISA) of 2007, Congress established the development of a Smart Grid as a national policy goal.
- Under EISA, NIST is directed to "coordinate the development of a framework that includes protocols and model standards for information management to achieve interoperability of smart grid devices and systems" as well as maintain the reliability and security of the electricity infrastructure.

NIST Three Phase Plan



President's Cyberspace Policy Review

…as the United States deploys new Smart Grid technology, the Federal government must ensure that security standards are developed and adopted to avoid creating unexpected opportunities for adversaries to penetrate these systems or conduct large-scale attacks.

Cyber Security Working Group (CSWG)

- To address the cross-cutting issue of cyber security, NIST established the Cyber Security Coordination Task Group (CSCTG) in March 2009.
- Moved under the NIST Smart Grid Interoperability Panel (SGIP) as a standing working group and was renamed the Cyber Security Working Group (SGIP–CSWG).
- The CSWG now has more than 500 participants from the private sector (including vendors and service providers), academia, regulatory organizations, national research laboratories, and federal agencies.

The CSWG Management Team

- Marianne Swanson – NIST Chair
- Bill Hunteman – DOE, Vice Chair
- Alan Greenberg – Boeing, Vice Chair
- Dave Dalva – CISCO, Vice Chair
- Mark Enstrom – Neustar, Secretary
- Tanya Brewer – NIST
- Victoria Yan – Booz Allen Hamilton
- Sandy Bacik - EnerNex

CSWG Meeting Info

- Weekly telecon
  - Teleconference Day & Time: Mondays, 11am Eastern Time
  - Call-in number: 866-793-6322
  - Participant passcode: 3836162

7

CWSG Subgroups and Leads

- **AMI Security Group**
  - Darren Highfill, Ed Beroset
- **Architecture Group**
  - Sandy Bacik
- **Bottom Up Group**
  - Andrew Wright; Daniel Thanos
- **Crypto and Key Management Group**
  - Daniel Thanos; Doug Biggs; Tony Metke
- **Design Principles Group**
  - Daniel Thanos
- **Privacy Group**
  - Rebecca Herold
- **R & D Group**
  - Isaac Ghansah; Daniel Thanos
- **Security Testing and Certification Group**
  - Nelson Hastings, Sandy Bacik, and Robert Former
- **Standards Group**
  - Frances Cleveland
- **Vulnerabilities Group**
  - Matt Carpenter, Matt Thomson

8

Guidelines for Smart Grid Cyber Security

- NIST Interagency Report 7628 - August 2010
  - Development of the document lead by NIST
  - Represents significant coordination among
    - Federal agencies
    - Private sector
    - Regulators
    - Academics

9

NISTIR 7628 – What it IS and IS NOT

What it IS

- A tool for organizations that are researching, designing, developing, and implementing Smart Grid technologies
- May be used as a guideline to evaluate the overall cyber risks to a Smart Grid system during the design phase and during system implementation and maintenance
- Guidance for organizations
  - Each organization must develop its own cyber security strategy (including a risk assessment methodology) for the Smart Grid.

What it IS NOT

- It does not prescribe particular solutions
- It is not mandatory

10

New Activities

- Introduction to NISTIR 7628
  - 20 Page description of the document content
  - Written for utility or security personnel
- SGIP Priority Action Plan (PAP) Collaboration
- Cyber Security Review of Standards
  - Completed - 5 Common Information Model Standards, NEMA Smart Meter Upgradeability Standard, 3 SAE Standards, the AEIC Metering Guidelines, the NAESB Energy Usage Information, NIST Wireless Guidelines (future NISTIR), OASIS WS-Calendar
  - Future - AMI Standards and Renewables Standards
- Ongoing work by some of the Subgroups

11

Priority Action Plans

Through the NIST Interoperability Framework Process, priority actions are identified. The priority action plans define the problem, establish the objectives, and identify the likely standards bodies and users associations pertinent to the standards modifications, enhancements, and harmonization required. See priority action plans page to view a calendar of PAP related events and meetings.

#	Priority Action Plan	#	Priority Action Plan
0	Meter Upgradeability Standard	1	Role of IP in the Smart Grid
2	Wireless Communications for the Smart Grid	3	Common Price Communication Model
4	Common Schedule Communication Mechanism	5	Standard Meter Data Profiles
6	Common Semantic Model for Meter Data Tables	7	Electric Storage Interconnection Guidelines
8	CIM for Distribution Grid Management	9	Standard DR and DER Signals
10	Standard Energy Usage Information	11	Common Object Models for Electric Transportation
12	IEC 61850 Objects/DNP3 Mapping	13	Time Synchronization, IEC 61850 Objects/IEEE C37.118 Harmonization
14	Transmission and Distribution Power Systems Model Mapping	15	Harmonize Power Line Carrier Standards for Appliance Communications in the Home
16	Wind Plant Communications	17	Facility Smart Grid Information Standard

Outreach – Completed

- University of Washington - Seattle,
  - 20-21 July 2010
- Cal Poly – Pomona,
  - 10-11 August 2010
- CPUC – San Francisco,
  - 28-29 September 2010
- University of Illinois – Champaign,
  - 5 November 2010
- Georgia Tech – Atlanta,
  - 18-19 November 2010 (following NARUC meeting)

13

Outreach – Going Forward

- Northeastern University – Boston, MA
  - 18 January 2010
- **New York PUC – Albany, NY**
  - 19 January 2010
- Ohio PUC – Columbus, OH
  - 26 January 2011
- University of Maryland, Baltimore Co. – Baltimore, MD
  - 15 February 2011
- Public Utility Commission of Texas
  - 23 February 2011

14

How to Participate in CSWG

- NIST Smart Grid portal http://nist.gov/smartgrid
- Cyber Security Working Group
  - Lead: Marianne Swanson (marianne.swanson@nist.gov)
  - NIST Support: Tanya Brewer (tbrewer@nist.gov)
- Cyber Security Twiki site
- http://collaborate.nist.gov/twiki-sggrid/bin/view/SmartGrid/CyberSecurityCTG

15