House Committee on Science and Technology
Subcommittee on Technology and Innovation

Hearing on "Smart Grid Architecture and Standards: Assessing Coordination and Progress"

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Written Testimony of
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GE Energy

Good morning Mr. Chairman and members of the Committee, I am John McDonald, Director, Technical Strategy and Policy Development, with GE Energy's Digital Energy business. In this role, I set and drive the vision that integrates standards, policy, regulatory and industry participation with customer solutions development at Digital Energy.

My comments today are based upon my more than three decades of experience working in the electric power industry, my position at GE and my numerous industry leadership roles. These include Past President of the Institute of Electrical and Electronics Engineers (IEEE) Power & Energy Society, current member of the Department of Energy (DoE) Smart Grid Electricity Advisory Committee, current Board Member of The GridWise Alliance and the IEEE – SA (Standards Association), and current Chair of the Governing Board of the NIST Smart Grid Interoperability Panel (SGIP).

I welcome this opportunity to provide an update on the SGIP's efforts in support of Smart Grid architecture and standards, and also to offer perspectives on behalf of GE on principles to guide standards development.

Introduction

The Smart Grid is essential to addressing the energy demand, security and environmental challenges we face. We commend our nation's leadership for embracing the Smart Grid in the Energy Independence and Security Act (EISA) of 2007 and the American Recovery and Reinvestment Act (ARRA) of 2009.

This legislation, and the direction being provided by various federal and state regulatory agencies, gives the industry a tremendous opportunity to noticeably begin transforming our grid into a more automated, interactive and intuitive power delivery system.

Crucial to this undertaking are system architecture and standards, the foundation for bringing together the electrical and communications infrastructure and for evolving technology to meet many and disparate needs. System architecture and standards that foster interoperability provide a framework for development, a roadmap for progress and a catalyst for continued industry investment.

In this area, and the areas of testing and certification and cyber security, there is a need for the government to play a coordinating role. The National Institute of Standards and Technology (NIST), under Dr. George Arnold's leadership as National Coordinator for Smart Grid Interoperability, has embraced this role and is working diligently to ensure we create a foundation that is built to last and a modern grid that will remain one of mankind's greatest achievements.

And, while all stakeholders want to move fast and get it right from the start, the reality is that we need to move with purpose and be able to adapt to a dynamic environment. Flexibility, uniformity and technology neutrality are key considerations for the decisions we make around systems architecture and standards. Furthermore, we need to make those decisions in an open, inclusive, transparent manner, where thoughtful debate, technology innovation and market forces help guide us. So balance – in terms of participation, perspective and direction – is essential to advancing both national and international Smart Grid efforts. To be effective, to realize our vision and produce the outcomes we intend to, the private and public sectors must continue to successfully partner with one another. We are working well today in this new paradigm and we will continue to improve with time.

GE Energy

GE Energy is one of the world's leading suppliers of power generation and energy delivery technologies with businesses focused on fossil power, gasification, nuclear, renewable energy – including wind, solar and biomass, oil and gas, water, as well as transmission and distribution. We have more than 100 years of industry experience, and our team of 65,000 employees operates in more than 140 countries.

GE Digital Energy

GE Digital Energy provides technology solutions that enable grid management and optimization for electric utilities worldwide. These solutions encompass hardware, software and services supporting the entire electricity delivery value chain, from power transformers at the generation switchyard to smart meters at the customer premises. They help utilities boost their productivity and reliability, while at the same time reducing their environmental footprint, and they empower consumers to monitor and control their electricity usage.

We have a strong North American presence, with headquarters in Atlanta, Georgia, and facilities across the United States, as well as in Mexico, Canada, the United Kingdom, Spain, Switzerland and India.

The business has experienced significant growth over the past few years, and we expect this trend to continue as electric utilities worldwide prepare for a more secure, low carbon energy future.

The NIST Roadmap [1]

The NIST Roadmap is phase one of a three-phase plan to establish standards, priorities and a framework to achieve Smart Grid interoperability. The second phase of the plan, in which I am pleased to participate, is the SGIP. The SGIP is an ongoing, public-private organization that provides an open process through which stakeholders can participate in coordinating, harmonizing and accelerating Smart Grid standards development. The third phase of the plan is the establishment of a framework for testing conformity with Smart Grid standards and certifying the compliance of Smart Grid devices and systems.

To help guide the industry, NIST defines interoperability as follows:

> The capability of two or more networks, systems, devices, applications, or components to exchange and readily use information - securely, effectively, and with little or no inconvenience to the user. [2]
> The Smart Grid will be a system of interoperable systems. That is, different systems will be able to exchange meaningful, actionable information. The systems will share a common meaning of the exchanged information, and this information will elicit agreed-upon types of response. The reliability, fidelity, and security of information exchanges between and among Smart Grid systems must achieve requisite performance levels. [3]

The NIST Roadmap contains several important items that shape the work of the SGIP.

- A conceptual reference model … to present a shared view of Smart Grid's complex system of systems and to facilitate design of Smart Grid architecture (See Figure 1)

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[1] *NIST Framework and Roadmap for Smart Grid Interoperability Standards, Release 1.0*, January 2010.

[2] Recovery Act Financial Assistance, Funding Opportunity Announcement. U. S. Department of Energy, Office of Electricity Delivery and Energy Reliability, Smart Grid Investment Grant Program Funding Opportunity Number: DE-FOA-0000058.

[3] GridWise Architecture Council, *Interoperability Path Forward Whitepaper*, November 30, 2005 (v1.0).

- An initial set of 75 Smart Grid standards for implementation … to address issues identified by NIST and priorities identified in the Federal Energy Regulatory Commission (FERC) Smart Grid Policy Statement [4] - demand response and consumer energy efficiency, wide-area situational awareness, energy storage, electric transportation, advanced metering infrastructure, distribution grid management, network communications and cyber security

- Priorities for developing additional standards and making revisions to existing standards, with supporting action plans … to resolve major gaps affecting interoperability and security of Smart Grid components

- Initial steps toward a Smart Grid cyber security strategy … to assess risks and to identify requirements to address those risks

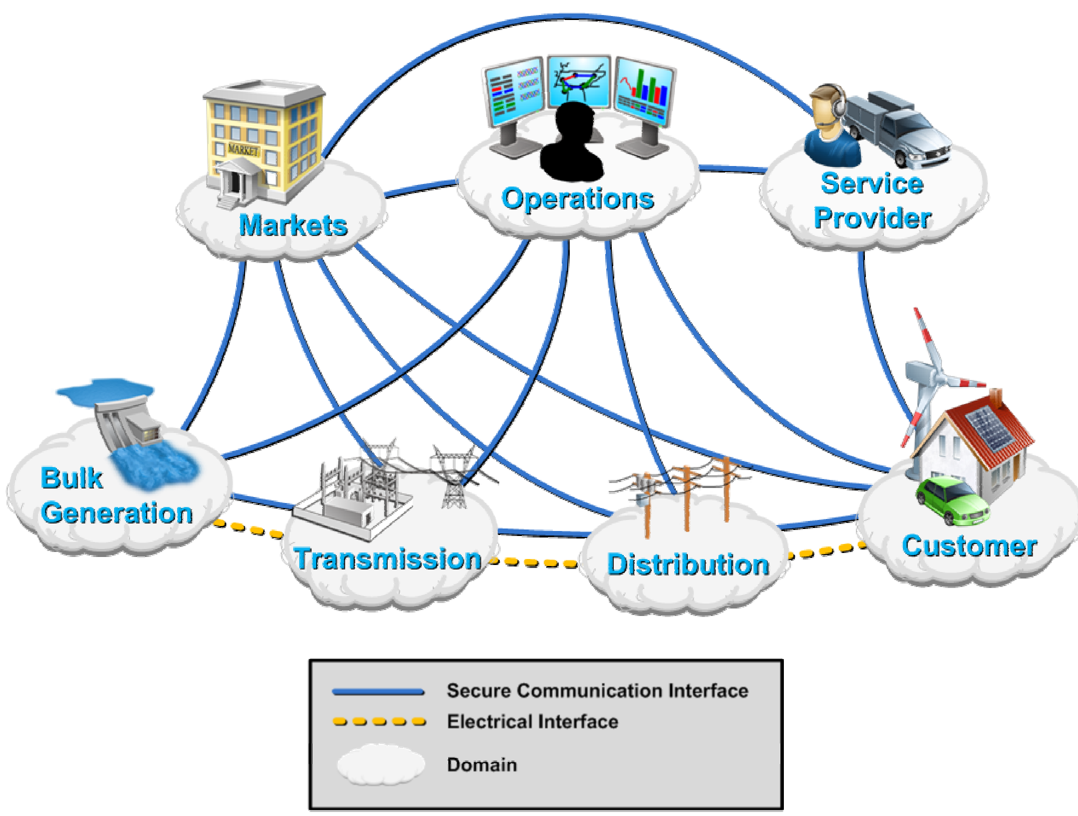

Figure 1 – NIST Smart Grid Conceptual Reference Model

[4] FERC Smart Grid Policy Statement, July 16, 2009.

Smart Grid Interoperability Panel [5]

Initiated by NIST and established in November 2009, the SGIP is dedicated to the interoperability of Smart Grid devices and systems. According to the SGIP charter:

> The Smart Grid Interoperability Panel is a membership-based organization created by an Administrator under a contract from NIST to provide an open process for stakeholders to participate in providing input and cooperating with NIST in the ongoing coordination, acceleration and harmonization of standards development for the Smart Grid. The SGIP also reviews use cases, identifies requirements and architectural reference models, coordinates and accelerates Smart Grid testing and certification, and proposes action plans for achieving these goals. The SGIP does not write standards, but serves as a forum to coordinate the development of standards and specifications by many standards development organizations.

Thus, the SGIP not only identifies and addresses standardization priorities, but also plays a leadership role in facilitating and developing an information architecture, a cyber security strategy and a framework for testing and certification. It focuses on analysis and coordination of effort in helping NIST fulfill its responsibilities under EISA. The NIST Roadmap is the starting point for this activity.

The structure depicted in Figure 2 enables the SGIP to accomplish its complex and urgent work. The SGIP membership is led by three core teams – NIST, Plenary Officers and a Governing Board – and it is fully supported by an administrator. The Governing Board that I now chair maintains a broad community based perspective by having a breadth of experience, knowledge and involvement. It also holds consensus as a core value, ensuring that all legitimate views and proposals are considered. Key responsibilities include approving and prioritizing work programs, facilitating dialogue with standards development organizations and arranging for necessary resources for the SGIP.

[5] *SGIPGB and SGIP Charter, Version 1.2*, June 10, 2010; SGIP brochure created for the 2010 IEEE/PES Transmission & Distribution Conference & Exposition; www.sgipweb.org.

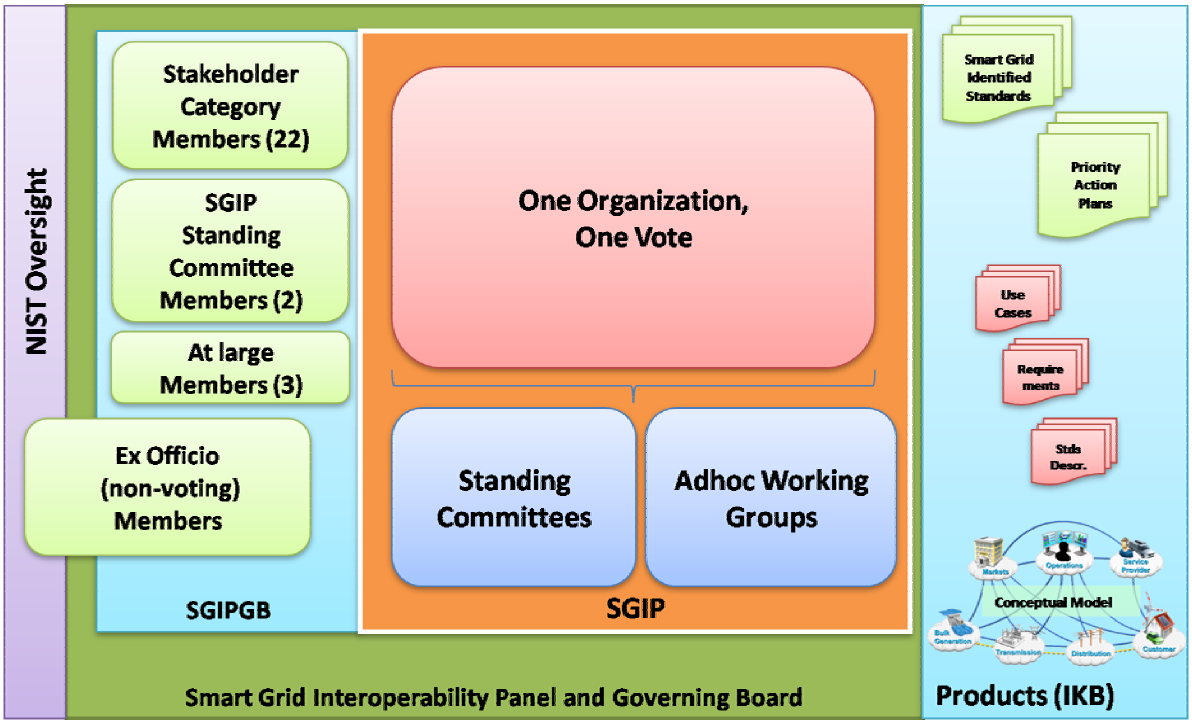

Figure 2 – The SGIP Structure

Our membership is large and diverse by design, as it is free and open to all who share the Smart Grid vision. To date, it consists of some 1,700 individuals from 590 member organizations (90% US, 5% Canada, 5% Other International) representing 22 stakeholder categories. Furthermore, the membership is organized into the following standing committees, working groups and teams, and is now supported by a Program Management Office.

- Standing Committees & Working Groups
    - Architecture (SGAC)
    - Cyber Security (CSWG)
    - Test & Certification (SGTCC)

- Domain Expert Working Groups
    - Transmission & Distribution (TnD)
    - Industry to Grid (I2G)
    - Building to Grid (B2G)
    - Home to Grid (H2G)
    - Vehicle to Grid (V2G)
    - Business & Policy (BnP)

- Priority Action Plan (PAP) Teams
    - Meter Upgradeability Standard
    - Role of IP in the Smart Grid
    - Wireless Communications for the Smart Grid
    - Common Price Communication Model
    - Common Scheduling Mechanism
    - Standard Meter Date Profiles
    - Common Semantic Model for Meter Data Tables
    - Electric Storage Interconnection Guidelines
    - CIM for Distribution Grid Management
    - Standard DR and DER Signals
    - Standard Energy Usage Information
    - Common Object Models for Electric Transportation
    - IEC 61850 Objects/DNP3 Mapping
    - Time Synchronization, IEC 61850 Objects/IEEE C37.118 Harmonization
    - Transmission and Distribution Power Systems Model Mapping
    - Harmonize PLC Standards for Appliance Communications in the Home
    - Wind Plant Communications

SGIP Status Report

To fully convey the effectiveness and progress of the SGIP to date, we need to address the following:

- What makes a standard? Why do standards not necessarily deliver interoperability? How can this be overcome?
- To what extent are currently available standards being implemented?
- How do we further advance the development of new standards?
- What ensures stakeholder buy-in and adoption of standards emerging from the SGIP process?
- How effective have we been in coordinating tasks and gathering stakeholder input in the SGIP process?
- What progress have our working groups and teams made since inception?

Relating Standards and Interoperability

With respect to a technical standard, conformance, interoperability and performance are critical. Technology may be developed in accordance with the standard, and it may even fully perform in a formal stress test state of heightened activity. However, there remains room for interpretation in how the technology is implemented, how it ultimately operates in conjunction with other technology. This differential between compliance in design and ease of use in system operation speaks to the technology's interoperability.

As we strive for interoperability across Smart Grid's system of systems, we strive for compatibility, even interchangeability, which goes beyond the everyday talk of plug and play. Getting all the devices and infrastructure to speak a common language, use common interfaces and really work in unison is a new reality for both suppliers and customers that have traditionally operated in silos, built around specific functionality and/or areas of expertise. From the utility's perspective today, a supplier needs to ensure interoperability of technology not only within its own portfolio, but also with the technology portfolio from competing suppliers. This provides confidence in the technology investment and, ideally, a better return on the investment due to fewer, more easily managed implementations and/or integrations. The creation of the SGIP, with its knowledge and focus on all the building blocks of Smart Grid and the networked domains they reside in, reinforces the need and provides a forum for more coordinated and further structured implementation of standards.

Encouraging Implementation

With all technical standards, we must also address the issue of application and use. The industry should be leveraging standards already developed and tested, even if the implementation of these standards needs to be further refined to promote interoperability. The major barriers to overcome in this area are awareness and risk aversion.

In the USA, the transition from DNP 3.0 to IEC 61850 for substation automation and communications is an excellent example of the challenge we have before us. IEC 61850 calls for sending protection messages over Ethernet local area networks (vs. dedicated copper wires) and accessing measurements via a central process bus (vs. wired to the individual relays). These relatively small technology changes, but large process and cultural changes, have resulted in continued performance with substantial savings for those deploying this new technology worldwide. But there is enough concern and resistance to these changes here in the USA that IEC 61850 is not yet widely accepted or deployed.

Currently, standards development organizations and suppliers do little to educate utilities about standards, their features, benefits and overall value. The education required is comprehensive and constant in nature, to address awareness, trial/usage, acceptance and adoption, even recommendation. In addition, there is apprehension on the part of some utilities and regulators that needs to be addressed. Is the technology proven, at scale, in a real-life operating environment? Is it hardened to withstand changes in that environment? Does the technology adhere to standards? If so, which standards? And will those standards stand the test of time?

To address awareness and risk aversion, we need engagement, active participation and collaboration among a fully representative set of stakeholders. Being part of the process is paramount to trusting the process and its outcomes. The SGIP embodies and promotes these principles. The charter, membership profile and structure of the organization clearly demonstrate the desire to be open and inclusive in composition, transparent in operations and in consensus with work product and deliverables. The Governing Board is constantly evaluating balance among stakeholders, particularly, suppliers and utilities. This is required for the SGIP to drive standards that are technically strong and able to be successfully implemented – affordably and without adversely affecting performance.

Addressing the Speed of Standards Development

The SGIP desires to create both a sense of stability and a sense of urgency with standards development. Suppliers may resist implementing technology that is not yet anchored to a standard. Utilities may also resist, and further require independent third party assurance of conformance once the technology is anchored to a standard. Timely development and implementation of standards are a priority, as delay may be a bigger risk for Smart Grid than balkanization. Our goal is to provide direction and a rapid path forward in that direction. To that end, the SGIP now has the ability to encourage standards development organizations to fast track a standard. This essentially means that NIST and the SGIP facilitate requirements capture, communicate a sense of urgency and push for expedited timetables with standards development organizations that still retain control of the actual development. The SGIP can also create additional PAPs as they are needed.

With respect to fast track, we should look to IEEE 1613, a standard for environmental requirements for networking equipment in the substation. The use of off the shelf retail networking equipment was a growing concern, creating an immediate need for hardened commercial equipment. The IEEE accomplished their task in just 18 months versus the usual four or more years and, this was back in 2003, well before the Smart Grid, NIST and the SGIP altered the landscape.

Additionally, when the SGIP – just three months in existence – recognized the growing importance of bringing and then managing wind on the grid, it quickly added PAP 16 around wind plant communications.

I also want to point out that, given the scope and pace of the SGIP agenda, we have recently established a Program Management Office to further coordinate and expedite the work of the various PAP teams. We have to ensure that we do not duplicate effort within the SGIP, and that technologies that are needed by multiple PAPs have consistency.

Achieving Stakeholder Buy-In and Adoption

As NIST and the SGIP continue their efforts, we have every reason to believe that we have created the right environment for private sector buy-in and support of Smart Grid standards. In addition to policies and procedures around membership, committee participation, work planning, project management, conflict resolution and the nomination and election of the SGIP leadership, we have influential parties including the DoE, FERC and the Office of Management and Budget (OMB), along with state regulatory and international agencies, who are shaping our initiatives.

The DoE funding announcements for the Smart Grid Investment Grant Program and Smart Grid Demonstration Program emphasize the importance of addressing interoperability and providing a summary of how a project will support compatibility with NIST's emerging Smart Grid standards framework and roadmap. As the grants are currently driving the majority of Smart Grid deployments, this tie to NIST and the work of the SGIP is important.

In addition, NIST expects that standards be produced and maintained by recognized standards development organizations as described in OMB Circular A-119 and the National Technology Transfer and Advancement Act. This ensures that standards and conformity assessment activities are acceptable for reference by federal and state regulators. Some regulators further assert that the American National Standards Institute (ANSI) or an ANSI-accredited organization be involved so that there is greater assurance of openness and consensus. Given the regulatory construct for our largest investor owned utilities and the significant business they generate for suppliers, the private sector will buy-in and adopt what the public sector will authorize and approve.

Guiding Development and Adoption Internationally

For global suppliers like GE, working closely with any and all standards development organizations that have ANSI type processes and a culture of openness and consensus is essential for both speed of development and stakeholder buy-in. The adoption of open, international standards means that the technology investments we make and solutions we provide can be most cost effectively developed and produced to serve the largest possible population.

Thus, while NIST and the SGIP have influence with national organizations, they must continue to gain traction and favor with international organizations such as the International Electrotechnical Commission (IEC) and the Internet Engineering Task Force (IETF). Outreach to and involvement with the IEC and IETF are required for the NIST model of coordination and collaboration to be adopted rather than merely replicated region by region. Standards that become regionalized and fragmented create difficulties for suppliers and unnecessary risks for the future of Smart Grid.

Ensuring Effectiveness of the SGIP Process

In all of the areas previously discussed in this SGIP status report, it is evident that the SGIP has been effective in coordinating tasks and gathering stakeholder input. Since the beginning of the year, NIST and the SGIP have gained interest and traction worldwide on their Smart Grid Conceptual Reference Model. The identification and prioritization of the 75 existing standards of greatest impact to Smart Grid interoperability and the 16 Priority Action Plans to address gaps and inconsistencies are driving much needed focus, while the SGIP structure and operating rhythm are driving much needed collaboration and consensus. Timelines are being adhered to, even accelerated, in light of related policy discussions and actions. Meetings are being co-located with other stakeholders and industry influencers to further harmonize our respective work. Examples of this include Connectivity Week with IEEE in May and the National Association of Regulatory Utility Commissioners Summer Committee Meetings in July. Just as the Smart Grid is new, expansive and virtually all encompassing, so is the work of the SGIP. Yet, we are being nimble and reacting quickly to meet our goals, exceed industry expectations and encourage the international community and other regional standards organizations to join in our efforts.

Reporting Progress Made by the SGIP

The overall PAP process is shown in Figure 3. Supporting accomplishments and timelines for each PAP, as presented in the May 24th Governing Board meeting, follow. [6] We are fortunate to be moving forward on all fronts, made possible by the commitment and contributions of our valued members.

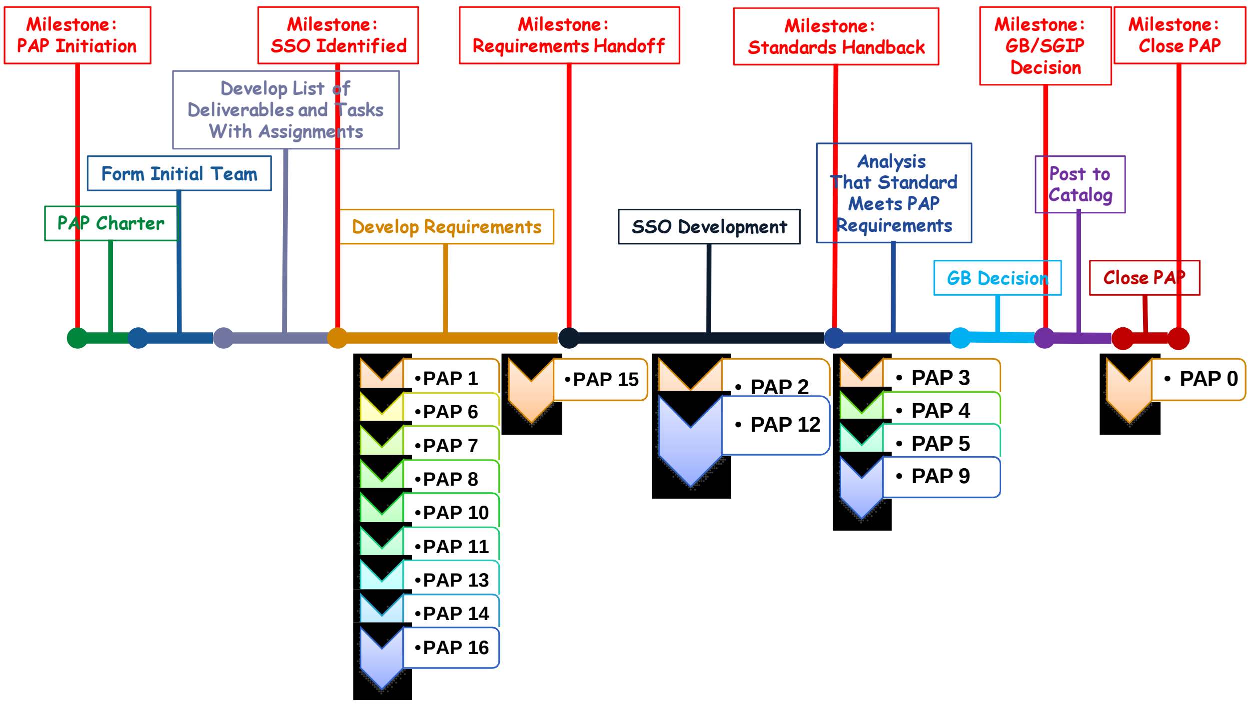

Figure 3 – PAP Process and Status

PAP 0 – Meter Upgradeability Standard:
Complete. This effort resulted in the NEMA standard SG-AMI 1-2009 in September, 2009. The PAP was officially closed March 1, 2010.

PAP 1 – Role of IP in the Smart Grid:
Quantified requirements for networking of Metering Systems and Initial Distribution Automation functions were completed.

PAP 2 – Wireless Communications for the Smart Grid:
The wireless capability matrix for Smart Grid applications was completed. Final deliverables are expected in May and June, 2010.

[6] SGIP Governing Board Meeting, May 24, 2010, presentation materials.

PAP 3 - Common Price Communication Model:
Use cases and requirements were completed. Combined PAP 3, 4, 9, 10 summit held in September, 2009. Draft specifications are in public comment period May 2010.

PAP 4 - Common Scheduling Mechanism:
Standard XML serialization for bi-directional translation, use cases and requirements to test the standard, and web services Application Programming Interfaces were completed. Combined PAP 3, 4, 9, 10 summit held in September, 2009. This PAP is expected to be closed in June, 2010.

PAP 5 – Standard Meter Data Profiles:
AEIC guidelines with revisions were completed along with white paper descriptions and presentation materials. This effort is expected to be closed mid-summer, 2010.

PAP 6 - Common Semantic Model for Meter Data Tables:
This PAP was dependent on PAP 5 and is now fully operational. Tasks and deliverables have been defined and use case analysis is currently underway.

PAP 7 - Electric Storage Interconnection Guidelines:
A scoping study and key use cases and requirements were completed. These deliverables have directly affected an accelerated pace of activity on IEEE 1547 and IEC 61850-7-420 standards.

PAP 8 - CIM for Distribution Grid Management:
Interoperability testing of CIM Wires Model and first set of key use cases and requirements are complete. Combined PAP 3, 4, 9, 10 summit held in September, 2009. Draft specifications are in public comment period May 2010.

PAP 9 - Standard DR and DER Signals:
NAESB has collected, analyzed, and consolidate use cases and delivered requirements to PAP team.

PAP 10 - Standard Energy Usage Information:
Contributions for supporting the requirements have been received from OpenADE, OpenHAN, EIS Alliance, and Zigbee. Requirements are being aggregated and a requirements review is imminent.

PAP 11 - Interoperability Standards to Support Plug-in Electric Vehicles:
Existing use cases and requirements identified and assembled. Coordination between SAE and IEC, alignment of vehicle information models, analysis of related standards, and connector alignment are ongoing.

PAP 12 - IEC 61850 Objects/DNP3 Mapping:
Use cases and requirements completed. Mapping is ongoing.

PAP 13 - Time Synchronization, IEC 61850 Objects/IEEE C37.118 Harmonization:
Harmonization use cases and requirements are complete. Gap analysis and mapping document are being completed in early summer, 2010.

PAP 14 - Transmission and Distribution Power Systems Model Mapping:
Developing use cases.

PAP 15 - Harmonize PLC Standards for Appliance Communications in the Home:
Completed requirements for wide band coexistence. Developing requirements for narrow band coexistence. IEEE and ITU modifying coexistence standards.

PAP 16 - Wind Plant Communications:
PAP approved. Charter completed. Team assembled. Tasks and deliverables identified. Use cases and requirements being developed.

As previously noted, the meter upgradeability standard (PAP 0) that gives guidance to utilities, regulators and others wanting to immediately deploy advanced metering infrastructure was completed last year. Other highlights since that May 24th Governing Board meeting follow:

- The team working on the development of energy usage information standards (PAP 10) recently reached a significant milestone. On June 23rd, the North American Energy Standards Board (NAESB) agreed to develop a basic energy usage data model standard, which the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) will extend for exchanging facility energy usage data with energy providers. NAESB has committed to complete the standard, which defines both the information used to communicate between utilities – and other sources – and the customer and how that information is organized, before the end of 2010.

- The team working on broadband and narrowband coexistence standards to provide for common communications mechanisms for appliance manufacturers (PAP 15) is nearing final selection of a supporting standards development organization.

- The SGIP just released a working draft of requirements for the essential application program interfaces for electronic calendars and schedules (PAP 4) and guidelines for "ANSI C12.19 End Device Communications and Supporting Enterprise Devices, Networks and Related Accessories" (PAP 5).

GE Position on Standards

Technical standards can accelerate innovation and investment in emerging technologies, provided those standards are developed and adopted in an open, consensus based fashion.

GE believes that the following principles should guide the federal government's engagement in private sector standards activities:

1. Encourage consensus based adoption of technical standards
2. Balance federal leadership with private sector innovation
3. Promote development of international standards
4. Utilize federal R&D to support standards development
5. Educate stakeholders to accelerate deployment of standards

We shared these same principles with ANSI with respect to the recently announced National Science and Technology Council (NSTC) Subcommittee on Standards, and we would welcome further discussion if so desired.

Concluding Remarks

In closing, let me reiterate what Robert Gilligan, Vice President, GE Digital Energy shared in his testimony before the House Select Committee on Energy Independence and Global Warming in February 2009. This is an unprecedented time in the energy industry. And, with respect to Smart Grid, this is definitely the time to be innovative, agile and willing to make bold moves. We are energized by the focus and momentum now surrounding Smart Grid and the solutions that enable energy efficiency, consumer empowerment and the integration of more renewable energy … solutions that in turn provide economic, environmental and energy security benefits to our nation.

We thank you, in advance, for your interest in and evaluation of how Smart Grid architecture and standards are progressing. As these represent the foundation we build upon, that will guide our technology development and innovation for years to come, it is essential we continue to move forward in a deliberate, disciplined fashion that represents and respects all industry stakeholders. While the work of NIST and the SGIP is extremely challenging, it is always rewarding given we are charting the course for a truly 21st century grid … steady, sustainable and truly smart.

Once again, we commend Chairman Wu for your leadership on these issues, and we appreciate the Committee's time and look forward to your questions.

Biography

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John D. McDonald, P.E., is Director, Technical Strategy and Policy Development for GE Digital Energy. In his 36 years of experience in the electric utility industry, John has developed power application software for both Supervisory Control and Data Acquisition (SCADA)/Energy Management System (EMS) and SCADA/Distribution Management System (DMS) applications, developed distribution automation and load management systems, managed SCADA/EMS and SCADA/DMS projects, and assisted Intelligent Electronic Device (IED) suppliers in the automation of their IEDs.

John received his B.S.E.E. and M.S.E.E. (Power Engineering) degrees from Purdue University, and an M.B.A. (Finance) degree from the University of California-Berkeley. John is a member of Eta Kappa Nu (Electrical Engineering Honorary) and Tau Beta Pi (Engineering Honorary), is a Fellow of IEEE, and was awarded the IEEE Millennium Medal in 2000, the IEEE PES Excellence in Power Distribution Engineering Award in 2002, and the IEEE PES Substations Committee Distinguished Service Award in 2003.

In his twenty-three years of Working Group and Subcommittee leadership with the IEEE Power & Energy Society (PES) Substations Committee, John led seven Working Groups and Task Forces who published Standards/Tutorials in the areas of distribution SCADA, master/remote terminal unit (RTU) and RTU/IED communications protocols. John was elected to the Board of Governors of the IEEE-SA (Standards Association) for 2010-2011, focusing on long term IEEE Smart Grid standards strategy. John was elected to Chair the NIST Smart Grid Interoperability Panel (SGIP) Governing Board for 2010.

John is Past President of the IEEE PES, is a Member of IEC Technical Committee (TC) 57 Working Groups (WGs) 3 and 10, is the VP for Technical Activities for the US National Committee (USNC) of CIGRE, and is the Past Chair of the IEEE PES Substations Committee. John was the IEEE Division VII Director in 2008-2009. John is a member of the Advisory Committee for the annual DistribuTECH Conference, is a member of DoE's Smart Grid Electricity Advisory Committee (EAC), is a member of NEMA's Smart Grid Council, and is on the Board of Directors of the GridWise Alliance. John received the 2009 Outstanding Electrical and Computer Engineer Award from Purdue University.

John teaches a SCADA/EMS course at the Georgia Institute of Technology, a Smart Grid course for GE, and substation automation, distribution SCADA and communications courses for various IEEE PES local chapters as an IEEE PES Distinguished Lecturer. John has published thirty-four papers and articles in the areas of SCADA, SCADA/EMS, SCADA/DMS and communications, and is a registered Professional Engineer (Electrical) in California, Pennsylvania and Georgia.

John is co-author of the book Automating a Distribution Cooperative, from A to Z, published by the National Rural Electric Cooperative Association Cooperative Research Network (CRN) in 1999. John was Editor of the Substations Chapter, and a co-author, for the book The Electric Power Engineering Handbook, co-sponsored by the IEEE PES and published by the CRC Press in 2000. John is Editor-in-Chief, and Substation Integration and Automation Chapter author, for the book Electric Power Substations Engineering, Second Edition, published by Taylor & Francis/CRC Press in 2007.