

SMART GRID ADVISORY COMMITTEE (SGAC)

**MINUTES OF JUNE 3-4, 2014, MEETING
NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY**

GAITHERSBURG, MD

ATTENDANCE

Smart Grid Advisory Committee Members

Ball, William
Gaddis, Evan
Jones, Lawrence
Mohn, Terry
Owens, David
Tobin, Thomas

NIST Staff

Boynton, Paul
Eustis, Allan
FitzPatrick, Jerry
Harary, Howard
Hefner, Allen
Holmberg, David
Greer, Christopher
Nguyen, Cuong
Pillitteri, Victoria
Prochaska, Dean
Wollman, David

Others

Bart, Dan, ValleyView Corp
Bertholet, Pierre-Yves G., IEEE
Fricklas, Shanna, Lewis & Clark Law School
Hoyler, Susan, SGIP
Wedin, Randy, Wedin Communications

June 3, 2014

Call to Order – Dr. Chris Greer, Senior Executive for Cyber-Physical Systems, NIST

Dr. Chris Greer called the meeting to order at 8:30 a.m. and turned to Mr. Owens and Mr. Gaddis to provide some opening remarks.

Opening Remarks – Mr. David Owens, Chair, Smart Grid Advisory Committee and Mr. Evan Gaddis, Vice Chair, Smart Grid Advisory Committee

Mr. Owens noted that this meeting represents a new focus for the Committee. The Committee had focused on interoperability and had provided input into the Smart Grid Interoperability Panel (SGIP) and its transition. The new topics for the Committee to consider for this meeting are transactive energy, resilience, and distributed energy resources.

Mr. Owens reviewed recent government-industry partnerships to improve resilience. He discussed the hybrid system that is evolving to include bulk power, microgrid, and distributed resources, and he highlighted some of the stability and balance challenges associated with the two-way flow of power and communication that is making the grid much more complicated.

Mr. Gaddis briefly discussed two new focuses for the National Electrical Manufacturers Association (NEMA): smart cities and the energy-water nexus.

The committee discussed the smart grid roles and relationships of NIST, other federal agencies, and the Smart Grid Interoperability Panel (SGIP). Just as the utility sector has many different companies and approaches, the federal government also has various agencies with different missions and different stakeholders. NIST's mission is to promote commerce (including competitiveness and job growth) using measurement science and with coordinating standards. SGIP, now an independent industry-led organization, is one of the organizations that NIST collaborates with on smart grid issues, and NIST treats SGIP as a peer.

The committee members raised several questions related to system performance and metrics. What are metrics for smart grid at the system level? What is NIST working on in this area? Dr. Greer responded that NIST is active in this challenging area, with programs such as phasor measurement unit (PMU) modeling, a workshop on "Measurement Challenges and Opportunities in Developing Smart Grid Testbeds," and ongoing interactions with the National Association of Regulatory Utility Commissioners (NARUC) and other organizations.

Program Overview – Dr. Chris Greer, Senior Executive for Cyber-Physical Systems, NIST

Presentation Summary – Dr. Greer provided an overview of the NIST Smart Grid and Cyber-Physical Systems (CPS) Programs. He discussed the Internet of Things and how it relates to smart grid. He provided some context around CPS and showcased smart grid as an example of a CPS. He discussed the concept of Internet of Things as a system of systems that enables much-increased capacity, capability, and reach. Dr. Greer defined cyber-physical systems as integrated, hybrid networks of cyber and engineered physical elements that are co-designed and co-engineered to create adaptive and predictive systems that can respond in real time to enhance performance. Dr. Greer highlighted progress toward Smart Grid 1.0 that includes the deployments of different technologies to date. He provided a list of disruptive forces that have driven and will continue to drive the development and deployment of smart grid. Dr. Greer charged the Committee with helping NIST to envision the technology and standards foundations that: 1) Ensure the landscape of disruptive forces can be forces for progress; 2) Empower

industry in responding to change; 3) Provide the basis for sound policy-making; and 4) Enable a smart grid of the future that provides for clean and reliable energy.

For more details, see Dr. Greer's [presentation](#).

Smart Grid/Green Button Update – Dr. David Wollman, Deputy Director, Smart Grid and Cyber-Physical Program Office, NIST and John Teeter, Presidential Innovation Fellow

Presentation Summary – Dr. Wollman provided an update on the NIST Smart Grid Program, highlighting staff changes, program planning, and projects. He provided a history and timeline for the NIST Framework and Roadmap for Smart Grid Interoperability Standards Releases 1.0 through 3.0.

Mr. Teeter provided an update on the Green Button Initiative. He outlined the past year's goals for the Green Button Presidential Innovation Fellows, which included growing the ecosystem, improving Green Button data, and leveraging Green Button in federal agencies.

For more details, see Dr. Wollman and Mr. Teeter's [presentation](#).

Cybersecurity Update – Ms. Vicky Yan Pillitteri, Advisor for Information System Security, NIST

Presentation Summary – Ms. Pillitteri provided an update on smart grid cybersecurity. She outlined the structure of the Smart Grid Cybersecurity Committee (SGCC) including its management team and technical subgroups. She provided an overview of smart grid cybersecurity accomplishments and planned activities, including work related to the president's Executive Order 13636 on Improving Critical Infrastructure Cybersecurity.

For more details, see Ms. Pillitteri's [presentation](#).

Smart Grid Testbed Update – Mr. Paul Boynton, Leader, Smart Grid Testbed and Dr. Allen Hefner, Leader, Power Conditioning Systems for Renewables, Storage, and Microgrids, NIST

Presentation Summary – Mr. Boynton provided an update on the progress of the smart grid and CPS testbeds. He gave an overview of the layout of the two testbeds, including the different modules and their respective leads. The smart grid testbed is being built as a “user facility” organized around a microgrid concept. The CPS testbed will focus on cross-cutting architectural layers, including computation, simulation, and analytics. Mr. Boynton reviewed findings from the recently held workshop on smart grid testbeds. The full report will be posted on the NIST Smart Grid [website](#).

Dr. Hefner provided additional details on phase one of the smart grid testbed. He provided an overview of the ongoing work on power conditioning systems (PCS) as it relates to the high penetration of distributed energy resources. Dr. Hefner described the work of the priority action plan on smart grid energy storage and distributed energy resources (ES-DER) standards (PAP 7). He also outlined the proposal for a new PAP on microgrids, including its proposed tasks.

For more details, see Mr. Boynton and Dr. Hefner's [presentation](#).

SGIP Update – Mr. Paul Boynton, Leader, Smart Grid Testbed and Mr. Dean Prochaska, National Coordinator for Smart Grid Conformance, NIST

Presentation Summary – Mr. Boynton provided some background information on the SGIP including its transition. NIST established the SGIP in November 2009 as a public-private partnership. In December 2012, it began transitioning to a member-funded organization called SGIP 2.0, and it became operational in April 2013. NIST and SGIP signed a memorandum of understanding in December 2012, and NIST is supporting SGIP through a cooperative agreement program that was put in place in April 2013. Mr. Boynton highlighted recent and upcoming SGIP activities.

Mr. Prochaska provided an overview of the SGIP Technical Committee (TC), a new committee that was created in SGIP 2.0 and is being chaired by Mr. John Caskey from NEMA. The TC provides oversight of the SGIP technical activities including the PAPs, the program management office, the standing member committees, and the working groups. He provided an update on the SGIP Implementation Methods Committee (IMC) and the SGIP Smart Grid Testing and Certification Committee (SGTCC).

For more details, see Mr. Boynton and Mr. Prochaska's [presentation](#).

Discussion – The group discussed the following topic:

- There is a need to communicate the value of SGIP to utility members. EEI could help provide the value proposition to utilities. It would be useful to highlight new activities such as PAP21, PAP23, the proposed microgrid PAP, and the Transactive Energy Working Party.

Overview of the NIST Engineering Laboratory – Dr. Howard Harary, Acting Director, Engineering Laboratory, NIST

Presentation Summary – Dr. Harary provided an overview of NIST and the Engineering Laboratory (EL); a description of EL strategic goals and how smart grid work contributes to those goals; an overview of the NIST disaster resilience effort for which smart grid is an essential element; and examples of NIST partnerships with counterparts in industry, academia, and other federal agencies. The EL mission is to promote U.S. innovation and industrial competitiveness in areas of critical national priority by anticipating and meeting the measurement science and standards needs for technology-intensive manufacturing, construction, and cyber-physical systems in ways that enhance economic prosperity and improve the quality of life. Dr. Harary also highlighted the area of disaster resilience, because NIST has launched a new initiative in this area, and the energy sector is critical to a comprehensive resilience strategy.

For more details, see Dr. Harary's [presentation](#).

SmartAmerica Challenge – Dr. Sokwoo Rhee and Mr. Geoff Mulligan, Presidential Innovation Fellows, NIST

Presentation Summary – Mr. Mulligan provided an overview of the SmartAmerica Challenge, including its vision to unleash the true value of various testbeds by demonstrating the benefits of interconnected Cyber-Physical Systems including improved safety, sustainability, efficiency, healthcare, and travel. The challenge had more than 100 participating organizations from industry, research/educational institutions, and government agencies that organized themselves into 24 project teams. The SmartAmerica challenge will culminate with a SmartAmerica Summit to be held in June 2014. The next step in the effort is a Global Smart Cities Challenge that will be launched in Fall 2014.

For more details, see Dr. Sokwoo and Mr. Mulligan's [presentation](#).

Working Lunch Discussion – NIST and SGIP

The group discussed current perceptions and issues related to the SGIP as an organization.

Several members pointed out that interactions between the SGIP and utilities deserved renewed attention. There is a perception among some utilities that the SGIP and its numerous working groups (e.g., Priority Action Plans or PAPs) are involved in too wide a range of activities. It is difficult for a utility to monitor and participate in so many different activities. Some organizations have decided, instead, to work directly with the Standards Development Organizations (SDOs) that actually write the standards. Committee members suggested that utilities, which have been deploying smart grid technologies but not always in a strategic way, could participate in the SGIP, identify their most important needs, and help focus the SGIP's work in a few key areas. Another suggestion was that the number of PAPs could be reduced, perhaps through merging several PAPs or discontinuing dormant PAPs.

The group discussed the future of the SGIP. It was pointed out that organizations, once established, tend to persist and expand. Would SGIP benefit from having a finite lifetime (as does the GridWise Alliance)? Now that the Catalog of Standards is becoming more complete, should SGIP and/or the industry refocus and work on other areas, such as smart cities, the energy/water nexus, smart transportation, or smart grid use cases for developing countries? What are the next steps for the SGIP?

Looking ahead to the next items on the committee's agenda (i.e., discussions on transactive energy, resilience, and distributed energy resources), committee members requested that those discussions should include the roles of NIST and SGIP. One area of concern is whether SGIP is getting too involved in issues that are really public policy issues.

Working Session

Prior to the meeting, committee members were provided with a set of related white papers and reports and a series of questions (see [here](#)). During the afternoon working session on June 3, the

committee held 90-minute discussions on two different topics: Transactive Energy and Resilience. The members discussed definitions, challenges, drivers, and ongoing developments.

End of Day One

The meeting was adjourned at 5:00 p.m.

June 4, 2014

Call to Order – Dr. Chris Greer, Senior Executive for Cyber-Physical Systems, NIST

Dr. Chris Greer called the meeting to order at 9:00 a.m.

During the morning working session on June 4, the committee held a 90-minute discussion on a third topic: Distributed Energy Resources. The members discussed definitions, challenges, drivers, and ongoing developments.

The committee has prepared a report summarizing the highlights and recommendations of the three working group discussions on Transactive Energy, Resilience, and Distributed Energy Resources. [The report is available here.](#)

Public Comments

The following comments were provided by members of the public in attendance:

- Is there now a critical mass for SGIP (195 members about 140 participating member)? How is the health of the SGIP?
- Regarding the perception that there are too many PAPs in the SGIP, it is actually the case that only 2-3 PAPs that are truly active. The other PAPs are in waiting mode (awaiting standards process from the SSOs). This creates a perception that are too many open work items. Is there a way to create a separate category for those PAPs that are waiting for standards to progress in the SSOs?
- SGIP leadership has been meeting with EEI and APPA to clarify the SGIP's involvement with regulators (NARUC) and to encourage more utility participation.

Committee Members Comments on Own Organizations' Priorities and Initiatives

As a way of identifying industry needs and directions, committee members were asked to comment on what initiatives and projects were important to their own organizations.

Several committee members identified smart cities as a top priority, including work being done in the U.S., Europe, and Africa. There will be communications challenges going forward, with the need for standards and protocols that can be used across the infrastructure and down to the individual device level. Big data and the standardization of data exchanges is a related topic.

The “huge” international market for utility infrastructure and integration is attracting increased interest from some organizations, as smart grid interest in the U.S. slows down. There will be opportunities for “reverse innovation,” as new technologies and lessons learned (e.g., with new energy infrastructures, DC microgrids, DER, storage, etc.) are brought back to the U.S. from abroad.

Committee members talked about increased interest in systems (as opposed to components). Storage, DER, distribution automation, and microgrids are introducing many opportunities and challenges, especially at the distribution level.

A key concern for a number of organizations is the evolving business model for utilities. What is the business case for involvement in smart cities, DER, distribution automation, energy storage, etc.? And how can utilities and regulators work together in these new areas?

Other topics mentioned during this discussion included the energy/water nexus, security (cyber-, physical, and supply chain), transactive energy, high-performance buildings, unmanned aerial systems, and sensors.

Close

The meeting was adjourned at 12:00 p.m. on Wednesday, June 4, 2014.