NIST SMART GRID ADVISORY COMMITTEE (SGAC)

MINUTES OF JULY 13-14, 2016, MEETING

NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

GAITHERSBURG, MD

ATTENDANCE

NIST Smart Grid Advisory Committee Members
Owens, David (Chair)
Mohn, Terry (Vice-Chair)
Centolella, Paul
Sanders, William
Tobin, Thomas

NIST Staff
Boynton, Paul
Burns, Martin
Gopstein, Avi
Harary, Howard
Hefner, Allen
Holmberg, David
Li-Baboud, Ya-Shian
Kandaswamy, Anand
McAllister, Therese
Miner, Laurel
Nguyen, Cuong
Pillitteri, Victoria
Rhee, Sokwoo
Song, Eugene
Wollman, David

Others
Griffith, Steve, NEMA
Johnson, Eric, Department of Commerce
Lasley, Samantha, UL
Penrose, Howard, SMRP
Turke, Andy, Siemens
Wedin, Randy, Wedin Communications

July 13, 2016

Call to Order – *Dr. David Wollman, Deputy Director, Smart Grid and Cyber-Physical Systems Program Office*

Dr. David Wollman called the meeting to order at 8:30 a.m. and turned to Mr. Owens and Mr. Mohn to provide some opening remarks.

Opening Remarks – *Mr. David Owens, Chair, NIST Smart Grid Advisory Committee and Mr. Terry Mohn, Vice Chair, NIST Smart Grid Advisory Committee*

Mr. Owens noted that this is a period of transformation in industry. He cited three important drivers for transformation: grid modernization, customized solutions, and clean energy. He also noted that it is important for the regulatory process, which moves slowly, to acknowledge and respond to the many changes currently under way.

Mr. Mohn highlighted a number of trends that he is seeing in the sector: importance of individual choice, increasing role of renewables, rise in community choice aggregation (CCA), utility interest in distribution system operators (DSOs) and in transactive energy, movement of wholesale technology (e.g., forecasting, DMS, GIS) into the distribution level (e.g., AMI).

Further details from the comments from Mr. Owens and Mr. Mohn are reflected in the Discussion Report.

NIST and Engineering Laboratory Update – *Dr. Howard Harary, Director, Engineering Laboratory*

Presentation Summary – Dr. Harary provided an update, including a NIST leadership update, Engineering Laboratory strategic goals, and highlights of program accomplishments. He also acknowledged the great loss suffered by the smart grid community with the recent death of Erich Gunther. The Committee observed a moment of silence in honor of Mr. Gunther.

For more details, see Dr. Harary's presentation.

Smart Grid Program Overview – *Mr. Avi Gopstein, Program Manager, Smart Grid and Cyber-Physical Systems Program Office*

Presentation Summary – Mr. Gopstein provided an update, discussing the Smart Grid Program's objective, budget, research motivations, and strategic themes. He then gave a program overview, with a focus on research, experimental facilities, and external engagement. He concluded with a look at challenges ahead.

For more details, see Mr. Gopstein's presentation.

During the discussion, Dr. Sanders noted that "cybersecurity" is no longer explicitly listed in the program objective and inquired about the significance. Mr. Gopstein replied that it is still there, as part of the broader issues of "sustainability" and "resilience."

Smart Grid and Cyber-Physical Systems Testbeds Update – *Mr. Paul Boynton, Testbed Manager, Smart Grid and Cyber-Physical Systems Program Office*

Presentation Summary – Mr. Boynton provided an update on the progress of the smart grid and CPS testbeds. For the smart grid testbed, he described the objectives, scope, physical layout, resources, and research directions. Mr. Boynton said that the architecture and initial experiments of the CPS testbed—the Universal CPS Environment for Federation (UCEF) Testbed—will be based on a federation concept.

For more details, see Mr. Boynton's presentation.

During the discussion, Mr. Mohn asked if the smart grid testbed would model phase imbalance and the management of fault events. Mr. Hefner replied that the testbed design can handle these issues and questions.

Dr. Sanders asked about the decision process for setting research priorities and about timetables. Mr. Gopstein described the process for setting priorities and timetables.

Mr. Tobin noted that industry is doing great work on fault detection for the transmission system. However, at the distribution level, the network is a (comparative) mess, and nobody is working on distribution fault detection.

Transactive Energy Challenge Update – *Dr. David Holmberg, Mechanical Engineer, Engineering Laboratory*

Presentation Summary – Dr. Holmberg provided an update on the Transactive Energy Challenge. He discussed the challenge's development premise, goals, and timeline. He also described the seven Phase I teams, and he discussed the Tiger Team established to accelerate agreement on a co-simulation framework. Finally, he reviewed plans for Phase II.

For more details, see Dr. Holmberg's presentation.

In the discussion, Mr. Centolella mentioned MIT's ongoing work to merge bulk- and distribution-level models to evaluate distribution locational marginal pricing (DLMPs) to assess impacts of volts, volt/VAR, and others to study very specific valuation questions (e.g., what's the value of putting PV arrays in one spot versus another). He also mentioned that the problem of federating different models is very difficult.

Smart Grid Interoperability Panel (SGIP) Update – *Mr. Cuong Nguyen, Program Analyst, Smart Grid and Cyber-Physical Systems Program Office*

Presentation Summary – Mr. Nguyen provided an update on the SGIP's 2016 plans, including its business focus and outreach; revenue plan; areas of focus; key technical activities and milestones; and upcoming annual conference.

For more details, see Mr. Nguyen's presentation.

During the discussion, Mr. Sanders pointed out that the high cost of some standards can be a barrier for the many small organizations operating in the smart grid area.

CPS Public Working Group and IoT-Enabled Smart City Framework Update – *Dr. Martin Burns, Electronics Engineer, Smart Grid and Cyber-Physical Systems Program Office*

Presentation Summary – Dr. Burns reviewed the CPS Framework program, including the Public Working Group, the framework's structure, and its open source project. He also introduced the concept of trustworthiness, which is one of the framework's nine "aspects."

Dr. Burns then reviewed the IoT-Enabled Smart City Framework (IES-City Framework) program, including its goal, the concept of pivotal points of interoperability, and the three working subgroups.

For more details, see Dr. Burns' presentation.

Global City Teams Challenge (GCTC) Update – *Dr. Sokwoo Rhee, Associate Director, Smart Grid and Cyber-Physical Systems Program Office*

Presentation Summary – Dr. Rhee provided an update on the Global City Teams Challenge program, including the status of GCTC 2016 and the recent GCTC Expo. He also discussed the program's plans for advancing smart city measurement science.

For more details, see Dr. Rhee's presentation.

During the discussion, Dr. Sanders suggested the possibility of encouraging GCTC action clusters to use the CPS Framework.

Ethics Briefing – *Mr. Eric Johnson, Attorney, Department of Commerce*

Mr. Johnson provided an ethics briefing to committee members.

Smart Grid Interoperability Testbed Tour

Committee members were led on a tour of the Smart Grid Interoperability Testbed, where they heard presentations by the testbed investigators

Community Resilience Program Update – *Dr. Therese McAllister, Manager, Community Resilience Program, Engineering Laboratory*

Presentation Summary – Dr. McAllister provided an update titled "Resilient Infrastructure: Context, Functionality, and Dependencies. Among the key concepts she discussed were functional requirements and recovery of function; the relationship between the concepts of resilience, sustainability, and climate adaptation; and community resilience planning.

For more details, see Dr. McAllister's presentation.

Committee Working Session on Role of the Electric Sector in Community Resilience

During the afternoon working session on July 13, the committee members discussed the topic of resilience, as well as other topics. Those comments are reflected in the Discussion Report.

End of Day One

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

July 14, 2016

Call to Order – *Dr. David Wollman, Deputy Director, Smart Grid and Cyber-Physical Systems Program Office*

Dr. Wollman called the meeting to order at 8:30 a.m.

General Discussion and Review of Day One

The committee members presented their general comments based on Day One's presentations and discussions. Those comments are reflected in the Discussion Report.

Grid 3.0 Update – *Dr. David Wollman, Deputy Director, Smart Grid and Cyber-Physical Systems Program Office*

Presentation Summary – Dr. Wollman presented an update on the Grid 3.0 initiative. He discussed how the initiative provides an important way for NIST to engage stakeholders—a responsibility assigned to NIST in the Energy Independence and Security Act (2007). He discussed the partner organizations collaborating in this effort, the kickoff workshop (held at NIST, March 2015), the organizing concept of "Future States," the three subsequent workshops, and next steps.

For more details, see Dr. Wollman's presentation.

The committee discussed and gave positive feedback to the concept of NIST hosting another Grid 3.0 meeting to review progress overall and to examine additional "future states" (such as looking at business models).

Committee Working Session on Grid 3.0 Drivers for Change and Architectures for Interoperability

During the morning working session on July 14, the committee members discussed the topics of Grid 3.0 drivers for change and architectures for interoperability, as well as other topics. Those comments are reflected in the Discussion Report.

Final Comments from Committee Members

Dr. Wollman noted that this would be the final meeting for many of the committee members, whose terms would be expiring in September 2016. He thanked the retiring members for their contributions and asked for final comments from committee members.

The reflections and comments from committee members included the following:

- I appreciated the comradery of the group.
- Our conversations have been rich in technology content and innovation ideas
- I put this group in the "Top Five" of dialogues in smart grid with which I've been involved.
- I appreciated being part of this diverse group.

- NIST has been responsive to the input of our committee.
- This group has focused on the right issues.
- It has been useful for NIST to have an academic representative on the committee.
- I've enjoyed this committee.

In addition to these reflections, the committee members offered final comments on some of the key subjects and issues discussed during the meeting. Those comments are reflected in the Discussion Report.

Public Comments

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

- This is a transformational time in the industry, due to the intersection of innovations in hardware, software, and networks.
- Cybersecurity and workforce are key areas of concern to several of the organizations.
- One of the organizations, Society for Maintenance and Reliability Professionals, expressed its interest in serving as a resource for NIST and working as a stakeholder/partner on key issues.

Close

The meeting was adjourned at 12:00 p.m. on July 14, 2016.