

Supplemental Documentation of Wayne Longcore

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Good afternoon, Chairman Wellinghoff, Commissioners and Staff of the Federal Energy Regulatory Commission. Thank you for asking me to present on what should be the future process for smart grid interoperability standards. I am pleased to present my comments today as someone deeply involved in the standards process as the Director of Enterprise Architecture and Standards at Consumers Energy, an investor-owned electric and natural gas utility serving 6.5 million of Michigan's 10 million residents. My comments today also include my perspective as:

- Vice chairman, Board of Directors for UCA International Users Group (UCAIug). This not-for-profit corporation has more than 7,000 people participating in collaboration teams through face-to-face and virtual meetings and collaborative websites. This organization has 61850 users' groups and the CIM (61968 and 61970) users' groups. These are three of the proposed five standards from the National Institute of Standards and Technology (NIST).
- One of the 13 members of the US Department of Energy (DOE) funded GridWise Architecture Council (GWAC) working on interoperability directions of the smart grid.
- A Governing Board member representing stakeholder category 13 (Professional Societies, Users Groups and Industry Consortia) of the Smart Grid Interoperability Panel (SGIP). The SGIP was created by NIST to fulfill the requirements for reaching sufficient consensus on standardization of the smart grid according to the Energy Independence and Security Act of 2007.
 - I am the Governing Board representative to the SGIP's Program Management Office
 - I am a member of the Smart Grid Architecture Council (SGAC) and one of the authors of the NIST smart grid conceptual model
 - I am a member of the Vision Mission and Roadmap team of the Governing Board
 - Several of Consumers Energy's employees and contractors, UCAIug members, and my GWAC peers work on various Priority Action Plans (PAPs) and as part of standing committees such as the Cyber Security Working Group (CSWG) of the SGIP and the Smart Grid Testing and Certification Committee (SGTCC).

I am here to discuss the process that has been designed for identifying, developing, and reviewing smart grid standards that have evolved from the process used by NIST to select the five standards posted on October 6, 2010. I will provide a description of the direction and future process to identify and prepare smart grid standards for FERC consideration, including information transparency and the development of consensus within the industry on those standards.

Based on the mandate of the US Energy Independence and Security Act (EISA) of 2007, NIST embarked on a three phase process in early 2009 to carry out those responsibilities. The result in Phase I was the identification of relevant standards, major gaps, priority action plans, and a detailed conceptual model to frame industry participation. This work has involved a large group of stakeholders to ensure that a consistent process is followed to reach consensus on the standards development and selection. Achieving the attributes of the smart grid, as stated by the DOE, will require standardization of devices and security to a point that customers and utilities are able to purchase, install and configure systems and devices that conform to level of standards that allow them, without a significant amount of work by these parties, to be interoperable. Standards for those key interfaces from a physical connection, an information and security level, to a regulatory level are required. Late in 2009, NIST initiated Phase II of the plan and created the SGIP, a single organization that is a focal point for identifying these interoperability requirements and standards, and to build consensus moving forward.

NIST has developed a process for standards to be reviewed by the standing committees (the Architecture Committee, the Cyber Security Working Group) as well as the Governing Board, and the entire plenary. The websites used as forums for documenting the NIST process act as one common point of collaboration for stakeholders. Other industry organizations and users groups such as the UCAlug have liaisons in place with standards organizations that give them access to pre-standard work materials allowing stakeholders in those groups to evaluate standards and influence direction prior to finalization. The Smart Grid consists of many different Standard Setting Organizations (e.g. ANSI, IEC, etc). Due to the varying financial and access requirements for these standard setting organizations, access to all of these standards for all stakeholders to review has been challenging. There is no single source of standards, such as these, that all stakeholders have access to review. The SGIP has developed a process with ANSI to make a large subset of completed standards to be made available to SGIP members. The main value of the SGIP however is in developing requirements and consensus on new and existing standards through relationships with the SSO's considering input.

Many organizations across the nation are working to achieve consensus on the direction of standards required for the smart grid. These groups include utilities, current and future vendors, academics and governmental agencies. They are joined by members of professional societies, user groups, consultants and industry consortia together working toward a process of open review and collaboration on the standards required to reach interoperability within the smart grid. At last count, there were 647 organizations with 1,681 individuals participating in the NIST Smart Grid Interoperability Panel process. One should not take from those numbers that only 1,681 people are working on standards. Those involved represent much larger organizations such as liaisons or information focal points. SGIP voting members such as Governing Board member Bob Saint, who represents the National Rural Electric Cooperative Association (NRECA), are also involved.



Establishing a mechanism for reaching consensus amongst a variety of interest is a major challenge for the standards process. NIST worked diligently to create an SGIP governance model with many checks and balances to ensure that a mechanism existed for all stakeholder voices to be heard - big and small - and maximize the ability to uncover new ideas, assess them, and generate broad consensus. A potential side effect of this approach is that some key groups could have a less than desired voice in the process if not mitigated. Of specific concern is that the utilities that are responsible for safely, reliably and cost effectively operating the grid are only "one voice among many" in the SGIP community and NIST process. Unchecked, the mechanism of reaching consensus could theoretically favor small companies where even a one-person consultancy striving to create a new market has the voting equivalence at the SGIP Plenary level to thousands of people working together as an Investor Owned Utility. Like any other form of representative governance, NIST has ensured that there are mechanisms to address issues such as uneven representation. One of those mechanisms in the SGIP is its Governance Board elected by vote of the 647 organizations that guarantees seats on the board for all SGIP stakeholder categories including each segment of the electric utility industry: the Investor Owned Utility stakeholder group, municipals, the rural cooperatives, independent power producers, transmission operators, and energy market traders.

The Governing Board is designed to equitably represent the various stakeholder groups no matter what the stakeholder demographics are of the SGIP as a whole.

The Governing Board has put in place a Program Management Office (PMO) to manage the process, to report out on the status of the various Priority Action Plans (PAP)s and to communicate status, schedule and resources issues. Priority Action Plans were created for managing major areas needing consensus and status changes. There are defined standing committees that are responsible for Architecture, Testing and Certification and Cyber Security.



The Governing Board meets on a monthly basis, and there is a bi-monthly meeting of the entire plenary. A monthly status score card is created by the Program Management Office. The standing committees meet in many small working groups and periodically as the larger teams. There are public websites set up to enable individuals and organizations to review the progress of each PAP, each standing committee, the PMO and the Governing Board.

A process has been set up for standards to get published to a Catalog of Standards (CoS) that requires documented consensus of these groups. This process requires that the Cyber Security Working Group and the Smart Grid Architecture Committee perform an assessment of the standard for fitting into the larger Smart Grid Conceptual Model, security paradigms, and the described layered architecture principles.

Within the SGIP, PAPs are projects established by the Governing Board to address standards gaps or overlap. PAP Working Groups (PAP WGs) are formed to address the gaps/overlap and develop a list of requirements necessary to resolve those issues. Once these requirements have been addressed by a SSO, the standard is passed back to the PAP WG. The PAP WG then convenes to determine whether the requirements developed by the WG were met by the standard. A 75 percent super majority consensus by the PAP WG is necessary to ensure that requirements have been met to recommend inclusion to the CoS. It is important to note that if the requirements were not met, the PAP WG can communicate with the SSO to achieve requirements compliance. If that activity has been exhausted and the SSO will not make any additional changes, the PAP WG may decide NOT to recommend the standard for inclusion.

A similar process is used by Domain Expert Working Groups (DEWGs) and other SGIP WGs when reviewing existing standards for inclusion in the CoS. WGs review the standards, identify any gaps or overlap issues and make a recommendation to the Board for inclusion. If issues are identified, a PAP is proposed and handed to the Board for consideration. If no issues are identified, the WG develops a standards review package which includes reviews by the CSWG and SGAC. The same process is followed for adding to the CoS with a plenary vote, although this has not actually happened yet since it is a new process that is currently under review.

For each standard, the CSWG and SGAC review to ensure that cyber security and architectural requirements have been achieved. If not, the standard is returned to the SSO responsible for the standard development and rework is performed.

Once these groups (the PAP WG, SGAC, and CSWG) determine that their requirements have been met, the standard is introduced to the Governing Board for review. The Governing Board then votes on whether the original objectives were met and whether to recommend the standard for inclusion in the CoS. This is a key step in the consensus process for the SGIP since the Governing Board is made up of equal representation from 22 different stakeholder categories, ensuring that all stakeholder communities have had a chance to discuss any issues, comment on the standard, and perform a vote.

The Governing Board's recommendation is included on the standards ballot for the SGIP members to consider and a vote is conducted by the SGIP members in "good standing" (good standing requires minimal participation and prevents the opportunity for non-participants to enter at the last minute and disrupt the voting results). The Governing Board recommendation only serves as a recommendation and the final decision on whether the standard is included in the CoS is in the hands of the SGIP Plenary (the entire SGIP). Of the participating organizations, the Plenary's voting members must achieve 75 percent consensus to determine that a standard should be added to the CoS. This open and transparent process ensures that all entities have a chance to read and understand the implications of a standard being added to the SGIP CoS.



It is important to have a clear consensus process for proposed standards. While each of these standards definitely had review during Phase I of the NIST process and possibly had the greatest consensus of any standards at that time, it is important to note that these first five standards were chosen prior to the development of the SGIP CoS process. They were, however, recognized as leading candidates to be submitted for such a consensus review based on the need for interoperability and capabilities described in the smart grid vision. We expect the consensus and standards review process to continue to evolve. It may not be necessary to vet standards previously reviewed using newly developed and improved processes. Indeed, this could present a bottleneck and an opportunity for some special interests to block progress through process churn. However, if a significant number of stakeholders find that a standard accepted in an earlier process was flawed by either the process itself or its implementation, then there should be a means to review them again using the current process in exceptional circumstances.

Equally important is to recognize different realms of consensus. Examples of this are consensus that a standard is itself technically sound, consensus that a standard is relevant to the smart grid, and consensus that a standard should be implemented in some time frame under specific conditions. These are all very different forms of consensus and need to be addressed individually.

Standards, when implemented appropriately, can drive economy of scale and increase entrepreneurial opportunity by reducing risk of vendor lock-in of proprietary systems. They also can reduce early obsolescence, financial and reputational risks associated with implementing stranded technologies. At the same time, standards when implemented improperly can also create early obsolescence, stranded investments and remove entrepreneurial opportunities. It is important for the industry to have a clear, open and transparent process to achieve consensus, to assure their relevancy to the Smart Grid standards environment.

When standards are proposed to FERC, there should be a further review by a review board that is more heavily weighted towards those that are responsible for the safety, reliability, and cost effectiveness of the grid. This review board (as yet to be created) should deal with the impacts and timelines required for adoption of such standards to the vendor community including development timelines and production considerations. Timelines should also be created for implementation for entities such as utilities, service providers and customers. Those timelines should account for legacy impacts both on systems and devices, including stranded assets and resource commitments.

If anything has been learned from other industries that have grown to the scale of the smart grid, it is that standards must be layered and allow for evolution away from a specific protocol or "layer" without having to throw away the entire system. It is important that we not require the usage of only one technology in each layer. Imagine if, when we initially communicated remotely with modems on physical phone lines, we had said no remote terminals will ever be allowed to work any other way. TCP/IP as a packet network would never have developed to form the internet and wireless would never have enabled mobility.

Developers, manufacturers, and the various end consumers of systems and devices matching these interoperability standards will be significantly aided by a clear and formal testing and certification process for systems and equipment that are claiming to meet a required standard prior to implementation. There must be a clear statement of implications for non-compliant system and devices and how cost recovery will be managed for those impacted by the move toward standardized functionality, interfaces and security methodologies.

A roadmap of standards deployment and evolution must recognize that not all assets have the same replacement lifecycles. Meters, transformers, cars and refrigerators have different life cycles than TVs, laptops and cell phones. Standards, especially security standards, must be crafted very carefully so they don't preclude upgrades that will correct or mitigate various issues as yet unexpected.

In conclusion, NIST should be commended for what it has accomplished in gathering a very large stakeholder community and developing an open process with significant open status reporting. I suggest the following as possible next steps:

- Require future proposed standards to FERC to be in the SGIP Catalog of Standards to openly and transparently assure consensus for standards that are being created or updated are deemed relevant to the smart grid. Many people are participating in that process and future proposed standards to FERC should be in the CoS.
- Assemble an implementation and roadmap working group of those who are responsible for the equipment, safety, reliability and cost effectiveness of the grid to put in place to review standards proposed to FERC and their impacts to the grid.
- Require Phase III of the NIST plan to be implemented assuring testing and certification of standards to assure interoperability and impacts to the owners and users of the electric grid.
- Clearly define and articulate a process that matches the standards coming through the CoS process to show their relevance to the grid, the process of the Implementation and Roadmap working group, and the adoption by regulators of standards.
- Adopt the five standards that were selected prior to the current process being complete only when clear implementation and roadmap issues are defined and articulated.