UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Smart Grid Interoperability Standards	)	Docket No. RM11-2-000

Comments of San Diego Gas & Electric Company

San Diego Gas & Electric Company ("SDG&E") files these comments in response to the questions set forth in the Supplemental Notice Requesting Comments issued by the Commission on February 16, 2011.[1] SDG&E is a public utility gas and electric company operating pursuant to authorities granted by the Commission and the State of California. Responsibility for the operation of SDG&E's bulk-power transmission system has been transferred to the California Independent System Operator (hereinafter, the "California ISO") and SDG&E is a market participant in the bulk-power markets organized, supervised and operated by the California ISO. SDG&E serves 3.4 million consumers in the San Diego and southern Orange County areas of California via 1.4 million electric meters, the vast majority of which are "smart" meters, and 830,000 gas meters.

SDG&E is among those companies leading the electricity industry in the development of operational and customer-service strategies enabled by the deployment of smart-grid technologies. SDG&E has already launched ambitious and wide-ranging plans to deploy those technologies. Thus, SDG&E has a keen interest in the interoperability of smart-grid equipment, technologies, systems, and applications, and in the interoperability standards that are the subject of this rulemaking.

A. Introduction

SDG&E strongly recommends that the Commission continue the important tradition that has marked the extensive prior industry efforts to develop smart-grid interoperability standards

[1] The Commission extended the date by which comments were to be filed in a Notice of Extension of Time issued March 2, 2011.

by emphasizing the voluntary nature of such standards. From the outset of the Commission's policymaking dockets related to the implementation of a national smart grid, SDG&E has urged the Commission to adopt standards that would provide clear guidance as to the goals and purposes interoperability standards are intended to achieve and serve, rather than attempt to develop prescriptive regulations with concomitant enforcement implications for technology adopters and developers. Clearly, those goals and purposes must include the paramount public interests in grid reliability and cybersecurity. But SDG&E continues to recommend the Commission refrain from imposing strict rules and compliance obligations upon the public utilities considering and deploying system enhancements using smart-grid equipment and technologies.

Under SDG&E's vision, a framework of voluntary, instructive standards would guide, but not define, the state of the art. Rather, the specifications and advancement of smart-grid technology and functionality would be defined by the speed of innovation and the creativity of technology developers rather than "the letter of the law" expressed as compliance obligations that must first run through the regulatory mill. SDG&E's vision is wholly consistent with the nature of the market-driven standards that guided the development of the Internet, a globally interconnected data and communications system of unprecedented innovation, diversity, ubiquity, breadth, depth, and complexity. Not only would the flexible framework SDG&E is recommending encourage smart-grid innovation to proceed at its own pace, but it would also facilitate cross-jurisdictional consistency among the myriad federal, state, regional, and local agencies with an interest in smart-grid deployment and operations, none of which has a clear claim to regulatory primacy.

These perspectives are particularly important to observe at this point in time when the concept of "smart grid" is still evolving and its outer limits defy definition. A flexible scheme of regulatory guidelines would allow individual utilities and technology developers options and choices, but serve to remind them as they exercise options and make decisions that certain goals and purposes, *e.g.*, maintaining grid reliability and assuring cybersecurity, must weigh heavily in their evaluations and decisions.

With respect to the regulatory processes that should be observed in the adoption of

standards, SDG&E recommends that the Commission exercise some independent review of any interoperability standard nominated to it for adoption. This would provide the Commission with direct evidence as to the sufficiency, quality and extent of the consensus supporting a proposed standard. In addition, SDG&E expects that any review process conducted by the Commission for standards would also provide periodic opportunities for the Commission to stay apprised of the developments in smart-grid functionality and innovation, as well as the progress that had been made in the implementation of the national smart grid.

B. Responses of SDG&E to the Questions Posed in the Supplemental Notice

In your view, would making standards enforceable best serve the intent of Congress to facilitate development and use of interoperability standards?

No. SDG&E believes Congress' underlying intent was, and the abiding purpose behind the Commission's actions in this rulemaking should be, to facilitate and speed the invention and deployment of smart-grid equipment, systems, technologies, and applications. Thus, in SDG&E's view, encouraging rapid adoption and innovation should be the fundamental purpose of considering and setting interoperability standards. Misdirecting attention to "policing" the technology selections of early adopters and force-fitting emerging technologies into regulatory constraints is antithetical to the development of new functionalities and broadening the benefits of smart-grid deployment. The adoption of standards, by emphasizing the need to assure smart-grid equipment and applications are interoperable within, between and among systems, can serve to reduce certain industry risks, such as premature obsolescence and asset stranding. But focusing on the enforceability and enforcement of standards, rather than on the purposes those standards should serve, naively presumes that any standards that are adopted have correctly anticipated, or can be changed quickly enough to address, the evolution of smart-grid concepts, technologies, architectures, and strategies.

Based on the issues raised at the Commission's January 2011 technical conference, SDG&E is hardly sanguine that the National Institute of Standards and Technology ("NIST") can be presumed to have developed a durable and appropriate set of standards, leaving early adopters, if the Commission is inclined to bring enforcement actions based solely on NIST's

work, at risk for failing to observe what are sure in short order to be revealed to be obsolete, incomplete or incorrect standards.[2] Even worse, the prospect that adoption of smart-grid technologies would place the adopter at risk to enforcement actions will discourage the deployment of certain equipment or applications, particularly where technological evolution or revolution is expected to occur, a result wholly inconsistent with Congress' intent to encourage national smart-grid implementation at pace.

Alternatively, if the Commission rejects SDG&E's view and believes Congress intended that the Commission adopt prescriptive regulations and penalize the deployment of nonconforming technology, SDG&E would urge the Commission, at a minimum, to conduct a robust rulemaking process, providing affected and interested parties with full opportunities to be heard, during which the Commission would independently review any standard prior to adoption. In addition, SDG&E strongly recommends that, either as a necessary part of the initial NIST standard-drafting process or as part of its later independent review, require both the North American Energy Standards Board ("NAESB") and the North American Electric Reliability Corporation ("NERC") to certify that any proposed interoperability standard is consistent with the standards and regulations these other organizations have adopted. Since these organizations, following processes involving considerable public vetting, have already adopted reliability and cybersecurity standards and regulations that are in many aspects mandatory and carry enforceable compliance obligations, SDG&E believes it is incumbent on the Commission to assure that entities subject to compliance with any interoperability standards would not be subject to inconsistent regulatory obligations or unclear liabilities.

For the future, the Commission should direct NIST to collaborate with NAESB and NERC to assure this consistency and, with respect to the five families of standards under consideration in this rulemaking, request and reflect their advice before adopting any of them. This will assure that standards proposed by NIST and/or adopted by the Commission pose no risk of noncompliance with NAESB and NERC standards. This should be an absolute precursor to the consideration of any enforcement implications related to NIST-developed standards.

[2] See, in this docket, the *Comments of AT&T Inc.*, at pages 4 to 5; regarding the potential harm that the adoption of standards for mesh solutions would have had on the adoption of point-to-point solutions. Similarly, SDG&E has consistently raised concerns that the adoption of prescriptive cybersecurity standards runs the risk that such standards will ultimately prove to be insufficiently responsive to, robust against, and anticipatory of emerging threats.

How does the determination of sufficient consensus implicate the requirement in "institute a rulemaking proceeding to adopt" standards and protocols?

From the very beginning of the industry's interest in smart-grid functionalities and, more recently, the Commission's consideration of smart-grid policies, standards and protocols, SDG&E has been a strong supporter of relying on transparent, collaborative, public processes to reach consensus-based results and solutions. Collaboration and consensus are necessary to assure that the public interests in interoperability and cybersecurity are embedded in the design and operation of the constituent piece-parts of the smart grid, particularly as technological innovation and deployment accelerate. SDG&E recognized this might be difficult or tedious since there innumerable parties with commercial interests in the development and deployment of the national smart grid, a concept which itself evolves with each new technological innovation. Adding to the complexity of getting the processes right is the fact that there are any number of federal, regional, state, and local agencies with an interest in the design, development and adoption of common standards and protocols governing smart-grid technologies.[3] Among these are the aforementioned authorities of NERC and NAESB, organizations with which this Commission has collaborated on any number of technical standards and regulations. Yet, despite the highly technical and frequently controversial nature of the subjects addressed in its collaborations with NERC and NAESB, the Commission and those agencies have always assured that their relevant processes were structured so as to enable stakeholders to participate effectively.

As the Commission is now aware, the lack of procedural structure to the standard-development processes used by NIST has left many parties dissatisfied with NIST's proceedings and, accordingly, the proposed standards resulting from the NIST's work. Although SDG&E is also concerned that the NIST's processes have been somewhat opaque and agrees with some of the procedural concerns that were expressed at the Commission's January 2011 technical

[3] Along these lines, SDG&E notes that the Federal Communications Commission in its National Broadband Policy proceedings is considering the manner in which electric utilities would be allocated broadband spectrum to support their smart-grid-related information and communications systems. That commission currently favors an allocation scheme under which electric utilities would be forced to "share" broadband spectrum with (or beggar capacity from) public-safety agencies, which creates interests in the deployment and operation of smart-grid equipment and applications among even the smallest local fire and police agencies currently allocated these spectral bands. [Cite.]

conference, SDG&E still finds that certain elements of NIST's proposed five sets of standards could be useful tools for the Commission and the electricity industry.

In defining the service to which NIST's proposed standards could be put, SDG&E would highlight Congress' use of the term "sufficient" as the critical attribute the Commission must find exists with respect to any "consensus" that might trigger the Commission's obligation to institute rulemakings related to smart-grid interoperability standards. As the Commission learned at its January 2011 technical conference, there is considerable controversy as to whether any consensus exists as to the propriety of either the proposed standards included in the five families of standards pending in this rulemaking or the processes used by NIST to develop those proposed standards. Notwithstanding these doubts, SDG&E believes there is yet a basis upon which the Commission could proceed with the adoption of the proposed standards now under consideration.

As SDG&E notes above, Congress qualified the precondition of "consensus" with the term "sufficient". SDG&E submits that the Commission could find that a "sufficient consensus" exists so as to trigger its own independent review of the proposed standards, even if there is some doubt that there is sufficient consensus upon which to adopt the standards themselves. During its review, the Commission could act to adopt those certain standards that may have achieved a higher level of "sufficiency" in the consensus they enjoy. For those proposed standards failing this review, the Commission should return them to NIST for further development and additional stakeholder processes. Over the long term, SDG&E believes that NIST and the Commission would reach a consistent and common understanding of the level of consensus that would be deemed "sufficient" to not only pass proposed standards out of the NIST process to the Commission, but that would also result in a relatively cursory, albeit still independent, review by the Commission.

What meaning should the Commission give to the phrase "as may be necessary to insure smart-grid functionality and interoperability in interstate transmission of electric power, and regional and wholesale electricity markets?" Should the Commission evaluate for adoption only those standards that are critical for applications and that may implicate the functionality and interoperability of interstate transmission or wholesale electricity markets?

In previous comments in filed in Docket No. PL09-4-000, SDG&E urged the Commission to assign the highest priority to the development and adoption of standards and protocols most consistent with the Commission's traditional jurisdiction, namely, standards related to the interoperability of equipment and systems affecting interstate and/or wholesale transactions and deliveries occurring on the bulk power system. This would encompass standards affecting cross-border, intersystem and/or interutility interfaces where communication flows and data exchanges would be necessary to assure interoperability of smart-grid equipment on both sides of the interface under secure conditions. SDG&E also continues to believe that the substantive character of the standards to which the Commission must turn its first and highest attentions should concern matters related to system reliability and security, subject matters well within the Commission's expertise and jurisdiction. SDG&E's position in these matters is unchanged. SDG&E continues to believe the Commission should place its initial and primary focus on standards and protocols affecting the interstate transmission of electric power and the operation of regional and wholesale electricity markets. The "standards that are critical for applications and that may implicate the functionality and interoperability of interstate transmission or wholesale electricity markets" would be those addressing grid reliability and security.[4]

How does the smart grid review process consider and evaluate "normative references" (*i.e.*, standards embedded within candidate standard for adoption, needed in order to comply with the standard)?

In addition, SDG&E notes that the embedding normative references in any standards should only be done in order to explain and clarify a standard and rejected where these references would unduly complicate or obscure the standard. The effectiveness of any standard will depend, in part, on making it simple enough to be understood and implemented. And again, as SDG&E has repeated throughout these comments, since SDG&E does not believe that "compliance" in the sense of meeting the letter of enforceable standards should be a part of this

[4] SDG&E has also recommended in its previous comments that the Commission place some priority on the development of standards for intelligent electronic devices placed at the subtransmission level due to the potentially large number of equipment providers. SDG&E continues to believe this is appropriate and to some extent NIST has addressed standards for this equipment in its proposed IEC 61850 standards.

rulemaking, SDG&E would also oppose the use of normative references in this context as well. In fact, SDG&E's concerns regarding the constraints enforceable standards would have on the pace of innovation are particularly salient in this context since, by providing additional specificity to any compliance obligations, normative references could preclude the adoption of noncomplying, but superior, technologies.

How does the NIST process assure that a standard has undergone sufficient review of interoperability and cyber security and is ready for consideration by regulators?

In terms of determining whether NIST's processes provide for a "sufficient" review from the objectives of achieving and assuring interoperability and cybersecurity, SDG&E reiterates its view that the "sufficiency" of the review processes should be adjudged from the perspective of the use to which NIST-developed standards will be put. As SDG&E recommends, NIST's proposed standards should be independently reviewed by the Commission and, even after Commission review and adoption, only serve as guidelines to utilities looking to implement smart-grid technologies and functionalities prospectively and to any potential developers designing new equipment, applications or systems. In the actual evaluation, selection, procurement, deployment, and operation of smart-grid technologies, the deploying utilities would consider the consistency of a smart-grid technology's design and/or operation with any adopted standards, but remain obligated to assure that its system was in compliance with applicable NERC and NAESB reliability and cybersecurity regulations. Consistent this view, NIST's processes should involve public reviews by NERC, NAESB and the Commission, with those reviews by NERC, NAESB and the Commission providing the assurance that the standards were consistent with other reliability and cybersecurity regulations rather than relying on NIST to address these concerns.

In addition, SDG&E submits that the evaluation of "use cases" should be an essential part of the NIST standards-development process and the performance of any NIST-proposed standards within those use cases should be provided to the Commission and become an essential part of the Commission's independent review process. SDG&E notes that the California Independent System Operator ("ISO") has begun the process of defining smart-grid use cases

and evaluating the market standards and protocols that would serve the interests of the California markets the ISO supervises. SDG&E believes the evaluation of standards and protocols within well-defined use cases provides a practical assessment of those standards and protocols which can then be used to sharpen their essential and appropriate characterization.

Should the Commission rely solely on the results of the NIST process, and not conduct independent analysis with respect to consensus? If the Commission were to define consensus in this manner, what changes, if any, would be required to the currently effective NIST process?

As noted throughout our comments, SDG&E strongly recommends against the Commission relying solely on the results of the NIST process in determining whether there is sufficient consensus to proceed with the adoption of interoperability standards by the Commission. As NIST itself acknowledged during the January 2011 technical conference, that NIST has recommended certain specifications of a standard or protocol, even if appropriate from a technical perspective, does not necessarily indicate that the implications of adopting those specifications as part of a standard or protocol have been fully considered.[5] As an example, evaluating the implications of the proposed standards for the continued use of legacy equipment and systems were not matters within NIST's expertise and not a focus of the NIST process. But this is a critical aspect of smart-grid implementation for any public utility and determining the cost-effectiveness of adoption and deployment.

In addition, SDG&E has previously commented that determining whether a consensus exists with respect to a proposed standard is not a simple matter of poll-taking. Testing the sufficiency of consensus in terms of whether a rulemaking process should be invoked must also involve qualitative assessments as to whether there is a sufficient breadth of affected parties, whether public utilities, technology developers and owners, or agencies with concurrent or associated jurisdictions, which are satisfied that all legitimate issues related to the proposed standards have been resolved. As noted previously, the unique interests and obligations of the electricity industry in grid reliability and cybersecurity issues are well known to NERC, NAESB and the Commission. At a minimum, those agencies should determine whether there is sufficient

[5] Cite to transcript.

consensus among their regulatory constituencies to adopt any interoperability standards touching upon their jurisdictions and regulations with respect to these matters. Additionally, issues beyond the scope of setting appropriate technical specifications associated with standards, *e.g.*, cost-effectiveness, might receive less attention at the NIST level than before the Commission simply as a matter of the resident expertise at each of the two agencies. So as to assure that all issues relevant to the Commission's jurisdiction over the electricity industry are considered in determining the quality of any consensus upon which NIST might have based any standards it proposes, SDG&E recommends that the Commission conduct its own independent analysis as to whether any specific set of proposed interoperability standards are based upon a "sufficient consensus".

Alternatively, should the Commission independently determine consensus? If so, how?

Yes, the Commission should independently determine the sufficiency of the consensus that was developed in the NIST process with respect to any set of proposed interoperability standards. This would naturally result in the vetting of any deficiencies in the processes used to develop any proposed standards or the proposed standards themselves. SDG&E envisions that the Commission would hear these concerns in a rulemaking proceeding, inviting interested parties to submit their comments on any proposed standards and providing opportunities to be heard as the Commission may determine would be appropriate. The Commission would proceed to determine whether additional processes should be conducted by NIST depending on its own assessment as to not only the breadth of any consensus supporting the proposed standard but the quality of that consensus as well.

What benefit does documentation of key attributes of a standard (cyber security, functionality, architectural relevance, interoperability, reliability, and implementation issues) bring? Is it necessary? Are there other attributes that should be included, or are any of the attributes noted here unnecessary?

The documentation of key attributes associated with any standard provides the benefit of identifying the goals and objectives of the standards being adopted, both as to any individual standard and all standards collectively. In the context of SDG&E's recommendations, defining these attributes would provide clear and additional guidance to public utilities that, where they choose to deploy technologies or systems not strictly conforming to the terms of any specific standard, those nonconforming technologies or systems should nevertheless address and meet the spirit and intent of the those standards most germane to their design and/or operation. Although it may not be "necessary" to clearly state the key attributes being served by a proposed standard, it would nevertheless be extremely useful to do so under the voluntary, flexible scheme of guidelines supported by SDG&E.

Is it appropriate for reliability and implementation issues to be reviewed by a separate panel, as some panelists commented at the technical conference, composed of utility representatives and NERC?

Yes. SDG&E fully agrees that issues related to reliability should be reviewed by an industry panel that includes NERC representatives and experts from public utilities that are deploying smart-grid equipment and technologies. The need for such reviews, in SDG&E's view, increases in direct proportion to the level of enforceable obligations the Commission attaches to any adopted standards.

How should testing and certification for cyber security requirements be incorporated into the adoption process?

SDG&E has previously recommended that testing and certification of smart-grid equipment and technologies be performed by an independent third party and that the Commission not rely upon self-certifications performed by vendors or public utilities. SDG&E suggested that this was a role that NIST could perform since, as the author of the standards, it would be the obvious expert as to whether any equipment or technology was conforming. In the more specific context where additional cybersecurity requirements are involved, SDG&E's recommendation would be to engage NERC and/or NAESB, or their delegates, as necessary or

beneficial in the testing and certification process.

[Provide comments on w]hether there is there a need for additional process concerning the five families of standards and if so, how, for example, the identified cyber security issues can be addressed given the NERC and FERC structures and the language of EISA.

SDG&E supports the comments of other parties that would have the Commission send certain portions of the five families of standards referred to the Commission by NIST back to NIST for additional stakeholder vetting and comments. As NIST itself conceded at the January 2011 technical conference, the standards included in the five families it identified for this rulemaking may not be sufficiently flexible to accommodate legacy equipment which, although nonconforming, is still serviceable and not cost-effective to replace, and may not provide reasonable timeframes in which transitions from nonconforming to conforming equipment could be made. Particularly if the Commission moves to have NIST's proposed standards carry mandatory compliance obligations under the aegis of the Federal Power Act, the Commission should assure that the important issues that were not addressed by NIST are considered through some additional process. SDG&E also supports the recommendations made by industry representatives that any additional processes observe more formal and structured processes and that a record supporting the adoption, as well as the details, of any standards is produced and preserved.

[Provide comments on w]hether the criteria for the Commission's evaluation should differ for interoperability and functionality, and the extent to which cyber security is an element of each.

SDG&E submits that the Commission should place priority on developing interoperability standards compared to standards for functionality. In any event, SDG&E considers cybersecurity an important element of the evaluation of any standards without regard to whether the standard addresses interoperability or functionality.

What are the key smart grid benefits that standards should enable? How can the Commission encourage the standards development process to incorporate the

continual, but gradual, growth in functionality that is occurring in smart grid implementations and pilot programs?

SDG&E has already embarked on the implementation of a comprehensive business-reinvention and technology-deployment strategy relying upon smart-grid equipment, systems, technologies, and applications. These efforts are calculated to improve the reliability, security and diversity of the SDG&E energy system and service offerings, involving the largest generating stations to discrete home networks behind the meter. SDG&E's strategy is designed to capture the broad range of operational efficiencies and facilitate the unlimited customer-service enhancements offered by emerging smart-grid functionalities and options, all within a reliable and secure environment and architecture. These strategic goals and purposes are intended to allow the SDG&E system to evolve, not only as technologies evolve, but to meet the increasing demands of SDG&E's customers and constituents.

As SDG&E prioritized, evaluated, selected, and deployed the individual components of the smart-grid we are implementing, we have invested considerable time and effort in the various public and private processes aimed at developing interoperability standards. As noted earlier, an important, defining attribute of all of these processes has been that participation has been voluntary, calibrated to the interests and circumstances of the participants. Accordingly, compliance with any of the frameworks, standards and criteria that have emerged from these groups is also voluntary. In none of the processes to which SDG&E has been a contributor has any party, despite any interest they might have in doing so, claimed to own the prescience that would make any standard so uniquely compelling and obvious that it should be universally accepted and eternally observed. Every process with which SDG&E has been involved was governed by the abiding concession that commercial interests and the creativity that fathers technological innovation would outrun any written standards, no matter the level of expertise and effort the parties invested in their development. This thinking has encouraged the continuing, and now long-lived, participation of a multitude of interests and parties, and prevented impasse with respect to even the most contentious and tedious issues. Based on its considerable experience with standard-setting in this context, which has also included its (less voluntary) participation in proceedings conducted by its state regulators, SDG&E submits that the Commission can most effectively encourage the continuous and timely development of

interoperability standards by resisting any temptation to adopt strict, mandatory regulations imposing compliance risks on public utilities, and relying on the market to dictate the natural evolution of standards as new applications, technologies, functionalities, and capabilities emerge.