Statement of Tim Roughan, Director of Energy and Environmental Policy, National Grid on behalf of the Edison Electric Institute
Review of Small Generator Interconnection Agreements and Procedures
AD12-17-000
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Good afternoon, I am Tim Roughan, Director of Energy and Environmental Policy, for National Grid. National Grid serves upstate New York, half of Massachusetts and most of Rhode Island with electric transmission and distribution electric service for 3.3 million customers, as well as an extensive gas transmission and distribution business. National Grid currently has over 400 MWs of one to six MW solar farms looking to interconnect to local 13 kV distribution facilities in MA due to subsidies from solar renewable energy certificates (SRECs) and net-metering programs, so it is quite familiar with all aspects of connecting large solar projects to its electric distribution system. I currently serve as the distributed generation (DG) policy and regulatory subject matter expert for the National Grid. I was involved in the original Small Generator working group in the 2002 to 2004 timeframe, as the northeast regional transmission owner's representative for the Small Generator Interconnection Procedures (SGIP) negotiations and the resulting Order No. 2006. I have been involved with both the technical and commercial aspects of distributed generation interconnection to the electric distribution system for over 10 years. Prior to that, I managed National Grid's power quality program and am quite knowledgeable about the effect poor power quality can have on our customers.

Today, I am pleased to represent the Edison Electric Institute and its member companies. In this capacity, I wish to thank the Commission staff for holding this technical conference to provide an opportunity to more fully discuss the issues presented by the Solar Energy Industries Association petition for a rulemaking to revise the "Small Generator Interconnection Procedures" for solar distributed generation.

EEI and its members support efforts to respond to business and technology changes in the electric industry. In Order No. 2006, the Commission was correct to acknowledge there is merit in revisiting the interconnection rules as industry evolves. EEI notes that its member companies work in partnership with the Electric Power Research Institute and other industry stakeholders to better understand distributed generation, including solar, and to determine how to best address safe and reliable interconnections. EEI strongly believes that consensus-based interconnection procedures that provide a reasonable balance between the goals of uniformity and flexibility, while ensuring reliability and avoiding unnecessary costs and disputes are critical. Indeed, the current SGIP, including the 15% screen (specifically the reference to section 2.2.1.2 of the SGIP) and 2 MW cap for Fast Track interconnections reflect the consensus of stakeholders involved in developing the recommendations underlying Order No. 2006 and provides utilities with the appropriate flexibility to prudently review and study the addition of distributed generation, including solar, at given locations to achieve safe, efficient and reliable operation of the system. This flexibility is essential to determine and accommodate the capabilities and limitations of utility systems in different locations, regions and markets.

Under the existing framework of Order No. 2006, the concerns raised in the SEIA Petition need to be properly addressed and appropriate consensus solutions crafted in the context of specific electric systems. The developments in California on these issues clearly demonstrate that utilities are open to discussion and amenable to changes in interconnection procedures after thorough stakeholder vetting of proposed changes in the context of specific electric systems. At the same time, it is evident from the response to the SEIA Petition that there is not the level of broad stakeholder consensus that led to the recommendations that provided a basis for Order Nos. 2003 and 2006.

With respect to the SEIA Petition, EEI observes that it proposes changes to the SGIP that focus exclusively on conveying advantages to a single DG technology without taking into sufficient account the utilities' abilities to ensure safety and reliability as well as potential cost and jurisdictional impacts. One of the results of Order No. 2006 is that a number of states adopted many aspects of the order for their state jurisdictional interconnection procedures. Also, since Order No. 2006 contemplates interconnection of projects smaller than 2 MWs, it is clear that the majority of projects of this size interconnect to local distribution, not transmission level facilities, because the cost of interconnecting to transmission voltages for projects of this size far exceeds the costs of interconnecting at distribution level voltages. More specifically, EEI does not agree with SEIA's proposal concerning the SGIP's 15% screen and 2 MW limit for Fast Track interconnections. These are important tools to ensure the electric system safety and reliability and do not constitute market barriers for distributed solar generation or any other type of generation. These aspects of the SGIP also are not discriminatory since they are equally applied

to all Fast Track interconnection requests and therefore effectively limit opportunities for electric utilities to favor their own generation, solar or otherwise.

Significantly, with the increase in DG penetration of all types, the 15% screen and retaining the existing 2 MW limit is even more critical with respect to ensuring safety and reliability. Aggregated DG and larger size DG can lead to islanding of the DG at times of minimum loading on the electric distribution system. This can result in dangerous conditions for utility employees and the general public, and potential significant damage to customer and utility owned equipment if the generating system is allowed to operate during the time when the distribution system's automated operation control systems are attempting to restore power in an affected area.

Advances such as inverters used to connect solar power to the grid, that are tested to specific IEEE 1547 and UL 1741.1 standards, prevent them from exceeding voltage and frequency limits as well as prevent islanding. The use of UL 1741.1 certified, or listed inverters has made interconnection of small solar projects routine. Many of the facilities being proposed for installation to the utility system are controlled by inverter configurations. These configurations typically contain multiple inverters and often inverters made by different manufacturers. However, few, if any, inverter manufacturers subject multiple inverter configurations of their own design or of other manufacturers to these same rigorous tests to check to make sure multiple inverter configurations will still operate as designed upon an islanded condition. Without this certainty, additional study and/or protection procedures are necessary. The existing screens provide a sufficient safety margin to the range of variations in feeder configuration that can

include nominal voltage, automated sectionalizing/restoration, switched capacitors and feeder voltage regulators.

It must also be noted that few large solar projects are proposed in large load centers, but rather are proposed in the less expensive rural parts of a utility's system where both minimum load conditions can vary widely, as well as where lower fault duties can cause much larger voltage excursions from varying power output of large solar projects due to cloud cover issues. There are additional safety and reliability issues with SEIA's proposals which will likely be discussed in this conference in more detail.

With respect to increasing the number of SGIP screens for the Fast Track projects, if this is done then the timelines currently in the SGIP would necessarily have to be significantly increased to allow enough time for a proper review to maintain safety and reliability. In some areas of the country, the use of screens in lieu of impact studies by utilities is not common, therefore this proposal would also require a transition period for utilities to gain expertise and train staff to use these screens. Hiring or contracting the necessary technical talent to conduct these studies takes time. This is critical given the complexity involved in this area, but especially if the number of screens is expanded. Also, in states with significant volumes and sizes of DG projects, it is primarily the volume of applications and complexity of the larger applications that drive alleged delays in interconnections. For example, in Massachusetts, the number of multiple MW scale solar projects proposed to be interconnected to the 13 kV distribution system has gone from none in 2009 to over 260 projects in 2012, representing approximately 400+ MWs. Understanding

that this volume is largely driven by state subsidy programs that may or may not exist in the future, caution must be exercised as to solving a problem that may or may not actually exist.

EEI has significant concerns with regard to SEIA's proposal to require public utilities to provide peak and minimum load information to solar developers. The use of a minimum load screen, while on its surface appears simple if the data is available, is actually quite complicated. A circuit's minimum load can vary widely from year to year as the distribution system is constantly changed to provide for new customer connections, as well as the needed redundancy and flexibility for reliability enhancements and work to maintain the operation of the system. Using a minimum load screen could essentially prevent a utility from modifying parts of its distribution system or utilizing those parts where large solar projects have been installed in the future or in contingency plans, ultimately causing higher costs for all customers.

This proposal also has significant cost implications in terms of the infrastructure needed to obtain the data and the expertise needed to analyze it. Since the planning criteria has always been to meet peak loads on the system, relatively few utilities have data on minimum circuit load, but have data on the circuits' peak loads. The cost of this additional data collection would therefore fall on the utilities' customers unless the solar DG developers accept the additional financial burden. Notably the solar developers have not volunteered to assume the costs associated with this burdensome and expensive request which makes their proposal unreasonable for many utilities. In addition to requiring utilities to install equipment along distribution circuits to collect the data necessary to develop circuit load, this proposal could force utilities to replace existing

relaying, protective devices, reclosers, circuit breakers and/or other substation equipment resulting in a significant amount of stranded costs.

SEIA's data requirement is also burdensome in that electric utilities typically do not maintain this information by line section, and, in many utilities, there are tens of thousands of line sections that would need to be monitored. Gathering this data for locations served by underground network systems would be especially costly, since the installation of the equipment and the communication challenges with underground vaults (many deep within buildings) is enormous. In addition, any locations where circuit ties are present would require the utility to collect the same data for circuits that have ties with the circuit in question in order to properly analyze and evaluate the impact during contingency situations.

It should be noted that given that distribution circuit loads are dynamic, and loads are often re-allocated between distribution circuits on an automated basis, collecting data to identify potential minimum daytime loads for each segment and updating information consistently would be a complex and burdensome endeavor. Moreover, from a planning stand point, it will be very difficult for utilities to install this type of equipment only where there is an aggregate existing and proposed solar distributed generation on a circuit that is 10% or more of peak load, so effectively this will be tantamount to asking the Commission to mandate system-wide information upgrades for the benefit of solar developers. It should be recognized that many utilities already have multi-year plans to overlay significant intelligence and communication in order to bring enhanced reliability to all customers. Thus, if utilities must modify this roll-out by requiring selective additions to proposed solar development sites will likely make this effort

much more inefficient, raising costs to all customers, in many cases after a state regulatory body has agreed to this as part of a utility's approved capital plan. Additionally, the Commission must understand that estimating minimum loads using supply settlement load profile data is also quite problematic because load profiles were never intended to be used in such a granular way. To the contrary, load profiles are used for a high level understanding of a utility's total system load, not localized loads on a single circuit.

An additional concern with SEIA's load data collection proposal is that certain circuit loads are specific to individual customers and providing peak and minimum load data to solar developers could unnecessarily increase the security risk to critical loads like police, fire, rescue, data centers, hospitals and national security interests, along with violating requirements to protect customer information. While there may be ways to mitigate such concerns, this will greatly complicate the interconnection process. Thus, as opposed to expediting the process, this proposal will likely create delays in the interconnection process along with potential disputes and thus adversely affect both electric utilities and interconnection customers.

EEI similarly does not believe that SEIA's proposal for independent third-party reviews of upgrade requirements to be given substantial weight is likely to expedite or lower the cost of interconnections. EEI believes that electric utilities are best positioned with knowledge of their systems to make these decisions about system upgrades to accommodate the interconnection of generators to systems. Second guessing of utility decisions about system upgrades by entities with no responsibility to maintain system reliability is most likely going to delay the interconnection process and thereby cause costly and lengthy disputes. In most cases, solar

project developers already have the ability to question the utilities' study results. Typically, developers suggest the use of non-standard equipment in lieu of the utility's standardized equipment to reduce costs. This can have significant impacts during storm restoration activities as utility crews have to deal with non-standard equipment and work methods. Moreover, many utilities will have security concerns about sharing their system data with third parties for such reviews. Thus, rather than adding a new layer of process and cost, the goal should be to have transparent standards that are followed in a non-discriminatory manner. Using language similar to section 8.3 of the LGIP would appear to be logical in order to provide additional transparency to an interconnecting customer, but this approach must be balanced by providing utilities with additional time to work through the comments and provide a re-written study report. Thus, it is questionable that this approach would result in expediting or reducing the costs of interconnections.

In summary, EEI opposes the SEIA petition's proposals and observes that there is nothing preventing stakeholders from working together to develop consensus for changes to the SGIP in the context of specific markets and electric systems. EEI also observes that no hard and fast conclusions have been reached on the interconnection issues raised in the SEIA Petition, and there is ongoing work on these issues in many states (e.g., California, New Jersey, Massachusetts, etc.), hence a variety of different opinions on how to address these concerns. Accordingly, as contemplated in Order No. 2006, the Commission should encourage industry stakeholders to work collaboratively to consider future improvements to interconnection procedures and address the solar industry needs on a case-by case basis. EEI believes proposed changes to the SGIP are best determined by broad and thorough stakeholder vetting similar to the

collaborative process leading to Order No. 2006, with particular examination of the safety and reliability issues raised in this proceeding. This is the best way for the Commission to continue to reach a reasonable balance between the goals of uniformity and flexibility while ensuring reliability and avoiding disputes and increased costs.

Thank you for the opportunity to participate in this Conference. I look forward to our discussion.