UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Grid Assurance LLC **)** **Docket No. EL15-_____**

PETITION FOR DECLARATORY ORDER AND REQUEST FOR EXPEDITED ACTION

Grid Assurance LLC ("Grid Assurance") is a new procurement, inventory management, and logistics support company that will provide emergency equipment supply services for transmission owners in the United States and Canada for the purpose of enhancing grid resiliency. Grid Assurance will (1) maintain an optimized inventory of critical spare transformers, circuit breakers and related transmission equipment, (2) provide secure domestic warehousing of the inventory of spares in strategic locations, and (3) release spare equipment to utility subscribers as needed to respond to emergencies. Grid Assurance seeks to address a critical national security need – supporting the resiliency of the bulk power system in the event of a catastrophic event such as a natural disaster or an attack – by making critical replacement equipment for the transmission grid readily available. The availability of an optimized inventory of long-lead-time critical spares, housed in strategically located, secure domestic warehouses, will allow for faster restoration following attacks on the grid, natural disasters, and other events that damage critical transmission equipment. This unprecedented spare equipment service is designed to help shield consumers from the devastating impacts of prolonged transmission outages. Thanks to economies of scale, diversification, improved logistics, and other efficiencies achieved through centralized inventory management and operations, the grid resiliency benefits achieved by Grid Assurance for its customers are

expected to come at a significantly lower cost than could be achieved by individual utilities acting alone.

The commercial viability of Grid Assurance, and the enhanced grid resilience and cost efficiencies from its operation, can best be realized through broad participation of transmission owners. Regulatory certainty is critically important for the prospective subscribers of Grid Assurance, many of which are expected to be public utilities regulated by the Commission. Therefore, in order to support broad participation by prospective subscribers, Grid Assurance is seeking to address potential regulatory uncertainty that could prove an impediment to utility participation. Pursuant to Rule 207(a)(2) of the Rules of Practice and Procedure of the Federal Energy Regulatory Commission ("FERC" or "Commission"), 18 C.F.R. § 385.207(a)(2) (2014), Grid Assurance respectfully petitions the Commission for a declaratory order making certain regulatory findings for the benefit of the prospective subscribers to the spare transmission equipment service to be offered by Grid Assurance. In particular, Grid Assurance asks the Commission to acknowledge the benefits offered by this type of sparing service model as a means for cost-effectively supporting grid resilience, and further asks the Commission to declare that: (1) contracting with Grid Assurance for access to spare critical transmission equipment is a permissible resiliency element of a physical security plan under Requirement R5 of mandatory reliability standard CIP-014-1; and (2) prior authorization under Section 203 of the Federal Power Act ("FPA") is not required for sales of spare equipment by, or purchases of spare equipment from, Grid Assurance.

I. INTRODUCTION

Grid Assurance has been formed to support grid resilience by enabling prompt restoration of the transmission grid upon the occurrence of certain types of catastrophic events, including but not limited to physical and cyber-attacks, electromagnetic pulses, solar storms, earthquakes, floods, fires and severe weather events (each, a "Qualifying Event"). Grid Assurance will own, maintain, and make readily available an accessible inventory of certain critical spare equipment required for transmission facilities. As the Commission recently observed, "[r]esiliency is as, or even more, important than physical security given that physical security cannot protect against all possible attacks."[1] An April 2014 report by the Department of Energy ("DOE"), however, explains that large power transformers "require a long lead time, and transporting them can be challenging. . . . If several [large power transformers] were to fail at the same time, it could be challenging to quickly replace them."[2] In April of this year, the first report of DOE's Quadrennial Energy Review Report ("QER Report") warned that "current programs to address the vulnerability may not be adequate to address the security and reliability concerns associated with simultaneous failures of multiple high-voltage transformers."[3]

To address this threat to the resiliency of the bulk power system related to the availability of large transformers and other essential equipment, Grid Assurance will (1) acquire an inventory of transformers, other long-lead-time items, and other critical spare

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[1] *Physical Security Reliability Standard*, 148 FERC ¶ 61,040, P 55 (2014).
[2] Infrastructure Security and Restoration, Office of Electricity Delivery and Energy Reliability, U.S. Department of Energy, Large Power Transformers and The U.S. Electric Grid at 31 (Apr. 2014 Update) ("2014 Transformer Report"), *available at*: http://www.energy.gov/sites/prod/files/2014/04/f15/LPTStudyUpdate-040914.pdf.
[3] Department of Energy, Quadrennial Energy Review: Energy Transmission, Storage, and Distribution Infrastructure at S-11 (Apr. 2015) ("QER Report"), *available at* http://energy.gov/sites/prod/files/2015/04/f22/QER%20Full%204.24.15_0.pdf.

transmission equipment[4] that will be optimized to the specific needs of Grid Assurance subscribers; and (2) maintain the spare equipment in secure regional warehouses located strategically around the U.S. to allow for timely delivery to affected subscribers upon a Qualifying Event. In addition, Grid Assurance plans to provide logistics support to assist subscribers in delivery of the equipment following a Qualifying Event and may offer certain delivery services. Grid Assurance will provide this "sparing service" to any transmission owner or developer, whether incumbent or non-incumbent, that enters into a standardized subscriber agreement with Grid Assurance ("Subscriber Agreement"), wherein the facilities covered by the sparing service can be specified by the subscriber. Under the Subscriber Agreement, each subscriber will be entitled to purchase inventory if it suffers equipment losses as a result of a Qualifying Event. Each subscriber would, in turn, pay subscription fees and equipment charges based on Grid Assurance's costs.

Obtaining the resiliency benefits of a large inventory of critical spare equipment, and the efficiency benefits of centralizing management of the inventory, will depend on attracting a significant level of subscriber participation by transmission owners. Grid Assurance seeks Commission actions that will support participation. In particular, Grid Assurance asks the Commission to acknowledge the benefits offered by this type of sparing service model as a means for cost-effectively supporting grid resilience, and further asks the Commission to make the following declarations to address regulatory uncertainties for the benefit of potential Grid Assurance subscribers:

[4] The inventory is expected to include, for instance, transformers, circuit breakers, phase angle regulators, shunt reactors, instrument transformers, recovery transformers, mobile transformers, mobile stations, control modules, bushings, coolers, conductors, and temporary towers. Decisions about what to hold in inventory will be driven predominantly by subscriber needs.

(i) Contracting with Grid Assurance for access to spare critical transmission equipment is a permissible resiliency element of a physical security plan under Requirement R5 of mandatory reliability standard CIP-014-1; and

(ii) Prior authorization under Section 203 of the Federal Power Act ("FPA") is not required for sales of spare equipment by, or purchases of spare equipment from, Grid Assurance.

Grid Assurance respectfully requests that the Commission act expeditiously on this petition and issue the declarations requested within 60 days from the date of filing. Such expedited action will support subscriber commitment and prompt implementation by Grid Assurance of its business plan so that the benefits of enhanced grid resilience can be realized in the near term.

II. COMMUNICATIONS AND CORRESPONDENCE

All communications, correspondence, and documents related to this Petition should be directed to the following persons:

Raja Sundararajan, CFA
Vice President, Transmission Asset Strategy and Policy
American Electric Power Service Corporation
1 Riverside Plaza
Columbus, OH 43215
(614) 716-2843
rsundararajan@aep.com

John C. Crespo
Deputy General Counsel – Regulatory and Nuclear
American Electric Power Service Corporation
1 Riverside Plaza
Columbus, OH 43215
(614) 716-3727
jccrespo@aep.com

Douglas W. Smith
Justin P. Moeller
Van Ness Feldman, LLP
1050 Thomas Jefferson Street, NW
Washington, DC 20007
(202) 298-1800
dws@vnf.com
jpx@vnf.com

III. BACKGROUND

A. The Risks to Grid Resilience from the Loss of Large Transformers and other Electrical Equipment Are Important and Growing.

The importance of a resilient and reliable electric grid to the functioning of a modern society cannot be overstated. As the opening paragraphs of the DOE's recent QER Report explain, without a reliable grid, "navigation, telecommunication, the financial system, healthcare, emergency response, and the Internet, as well as all that depends on it, become unreliable."[5] A functioning, resilient grid also is critical to ensuring supplies of other forms of energy for American homes and businesses. DOE found that dependencies and interdependencies between the electric system and gas and oil infrastructure are growing, because many components of liquid fuels and natural gas systems require electricity to operate.[6]

Some of the most important and vulnerable components of the electric transmission grid are the large transformers, circuit breakers, and other specialized, long-lead-time electrical equipment that are essential to the functioning of the electrical system. As DOE explains in the QER Report:

> High-voltage transformers are critical to the grid. They represent one of its most vulnerable components. Despite expanded efforts by industry and Federal regulators, current programs to address the vulnerability may not be adequate to address the security and reliability concerns associated with simultaneous failures of multiple high-voltage transformers.[7]

Electrical infrastructure faces a range of growing threats. As DOE observes in the QER Report, "threats to the grid—ranging from geomagnetic storms that can knock out crucial transformers; to terrorist attacks on transmission lines and substations; to more

[5] QER Report at 1-4.
[6] *Id.* at 2-2.
[7] *Id.*

flooding, faster sea-level rise, and increasingly powerful storms . . . have been growing even as society's dependence on the grid has increased."[8] The risks to electricity transmission and electricity substations are particularly high. Transmission has "[h]igh vulnerability to physical attacks and wind [and] medium-high vulnerability to earthquakes, wildfires, snow and ice, extreme heat, and geomagnetic storms."[9] Electricity substations face "[m]edium-high vulnerability to cyber and physical attacks and geomagnetic storms" and "large power transformers (LPTs) in such substations are a particular concern."[10]

Weather and flooding represent one important and growing threat to the resiliency of the grid. DOE found that "electricity system outages attributable to weather-related events are increasing, costing the U.S. economy an estimated $20 billion to $55 billion annually,"[11] while sea level rise could cause "the number of electricity substations in the Gulf of Mexico exposed to storm surge from Category 1 hurricanes [to] increase from 255 to 337" by the year 2030.[12]

Cyber-attacks represent another growing threat to grid resiliency. Although cyber-attacks have yet to cause significant disruptions in electricity supply, the energy

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[8] *Id.* at S-5.
[9] *Id.* at 2-8.
[10] *Id. See also* Paul W. Parfomak, Cong. Research Serv. (CRS), Report No. R43604, Physical Security of the U.S. Power Grid: High-Voltage Transformer Substations at 6-7 (June 17, 2014) ("CRS Report"), *available at* http://fas.org/sgp/crs/homesec/R43604.pdf ("All HV [High Voltage] transformers are designed to withstand operational risks such as lightning strikes, hurricanes, and network power fluctuations—but they are vulnerable to intentional physical attacks. Despite their great size and internal complexity, HV transformers can be readily disabled or destroyed.").
[11] QER Report at 2-6 (citing R.J. Campbell, Cong. Research Serv., Report No. R42696, Weather-Related Power Outages and Electric System Resiliency (August 28, 2012), *available at* http://www.fas.org/sgp/crs/misc/R42696.pdf).
[12] QER Report at 2-9.

sector now leads all other sectors in terms of the number of cyber incidents reported.[13] Indeed, in 2013, more cyber incidents were reported in the energy sector than in all other sectors combined.[14]

Physical security is also a known and growing issue. For example, in April 2013, several individuals attacked a PG&E substation in Metcalf, California, using rifles to damage and disable multiple transformers.[15] A 2014 Congressional Research Service ("CRS") report on physical security risks to the electric grid provides additional recent examples of attacks on transformer substations,[16] while the QER Report concludes that both "[c]yber incidents and physical attacks are growing concerns":

> [T]he number and sophistication of threats are increasing, and information technology systems are becoming more integrated with energy infrastructure. There have been physical attacks; while some physical protection measures are in place throughout [transmission, storage, and distribution] infrastructure systems, additional low-cost investments at sensitive facilities would greatly enhance resilience.[17]

Additional risks to the resiliency of the grid and to large, long lead time equipment like transformers and circuit breakers include geomagnetic disturbances and

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[13] *Incident Response/Vulnerability Coordination in 2014*, ICS-CERT Monitor at 1 (March 11, 2015), https://ics-cert.us-cert.gov/sites/default/files/Monitors/ICS-CERT_Monitor_Sep2014-Feb2015.pdf.

[14] *See* National Cybersecurity and Communications Integration Center, Dep't of Homeland Security, ICS-CERT Year in Review at 8 (2013), *available at* https://ics-cert.us-cert.gov/sites/default/files/documents/Year_In_Review_FY2013_Final.pdf ("In 2013, attacks against the Energy sector represented over 56 percent of all incidents reported to ICS-CERT.").

[15] Rebecca Smith, *Assault on California Power Station Raises Alarm on Potential for Terrorism*, The Wall Street Journal (Feb. 5, 2014), http://www.wsj.com/articles/SB10001424052702304851104579359141941621778.

[16] *See* CRS Report at 7 ("In October 2013, the U.S. Justice Department charged an individual with attacks on the transmission grid in Arkansas, including a deliberate fire at Entergy's 500 kV substation in Lonoke County. The fire consumed the substation control house but electrical service was not interrupted. In 2005, at a Progress Energy substation in Florida, a rifle attack ruptured a transformer oil tank, ultimately causing an explosion and local blackout.") (citations omitted).

[17] QER Report at 2-2.

electromagnetic pulse attacks.[18] A report by Lloyds of London estimates that a large geomagnetic disturbance event could cost more than $2 trillion and lead to disruptions lasting up to two years.[19] Importantly, "[t]he duration of outages [from a large geomagnetic disturbance] will depend largely on the availability of spare replacement transformers. If new transformers need to be ordered, the lead-time is likely to be a minimum of five months."[20]

The Commission is well aware of these risks. Indeed, in many cases the Commission itself has taken the initiative in recent years to order the North American Electric Reliability Corporation ("NERC") to establish and update reliability standards to protect the electric grid from a variety of threats including cyber and physical attacks[21] as well as geomagnetic disturbances.[22]

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[18] *See* QER Report at 2-2; Lloyd's, Solar Storm Risk to the North American Electric Grid (2013), *available at* https://www.lloyds.com/~/media/lloyds/reports/emerging%20risk%20reports/solar%20storm%20risk%20to%20the%20north%20american%20electric%20grid.pdf; North American Electric Reliability Council ("NERC"), 2012 Special Reliability Assessment Interim Report: Effects of Geomagnetic Disturbances on the Bulk Power System (Feb. 2012), *available at* https://www.frcc.com/Public%20Awareness/Lists/Announcements/Attachments/105/GMD%20Interim%20Report.pdf; H. Kirkham et al., Pacific Nw. National Laboratory, Geomagnetic Storms and Long-Term Impacts on Power Systems, Report No. PNNL-21033 (Dec. 2011), http://www.pnnl.gov/main/publications/external/technical_reports/PNNL-21033.pdf (prepared for DOE); NERC, High-Impact, Low-Frequency Event Risk to the North American Bulk Power System (June 2010), *available at* http://www.nerc.com/pa/CI/Resources/Documents/HILF%20Report.pdf; John Kappenman, Metatech Corp., Geomagnetic Storms and Their Impacts on the U.S. Power Grid, Report No. Meta-R-319 (Jan. 2010), *available at* http://web.ornl.gov/sci/ees/etsd/pes/pubs/ferc_Meta-R-319.pdf (prepared for Oak Ridge National Laboratory).

[19] Lloyd's, Solar Storm Risk to the North American Electric Grid, at 4.

[20] *Id.*

[21] *See, e.g.*, *Mandatory Reliability Standards for Critical Infrastructure Protection*, Order No. 706, 122 FERC ¶ 61,040, *order on reh'g*, Order No. 706-A, 123 FERC ¶ 61,174 (2008), *order on clarification*, Order No. 706-B, 126 FERC ¶ 61,229 (2009), *order on clarification*, Order No. 706-C, 127 FERC ¶ 61,273 (2009); Version 4 Critical Infrastructure Protection Reliability Standards, Order No. 761, 139 FERC ¶ 61,058 (2012), *order denying reh'g*, 140 FERC ¶ 61,109 (2012); *Reliability Standards for Physical Security Measures*, 146 FERC ¶ 61,166 (2014).

[22] *Reliability Standards for Geomagnetic Disturbances*, Order No. 779,

B. Limited Interchangeability, Limited Inventories, and Long Lead Times Associated with Obtaining Replacements for Large Transformers and Other Equipment Can Compromise Grid Resiliency.

The potentially devastating impact of loss of major transmission infrastructure is compounded by three factors that affect a utility's ability to quickly recover from the loss of major transmission equipment: (1) limited interchangeability among large power transformers; (2) limited inventories of spare equipment; and (3) long lead times for production and transportation. The first major challenge affecting the ability to recover from the loss of one or more large transformers is that in many cases, this equipment is uniquely designed for both its electrical and physical properties. As a 2014 Congressional Research Service Report on the physical security of the grid observes, "most HV [High Voltage] transformers currently in service are custom designed and, therefore, cannot be generally interchanged."[23] DOE also recently warned that a lack of "off-the-shelf" options for large, expensive transmission equipment could impact reliability:

> Sometimes the challenge of completing infrastructure investment is dependent on the time and schedule associated with the manufacturing of large power transformers. The Western Area Power Administration experienced this situation with its most recent transformer procurement and installation. Scheduled delivery of this transformer was planned to be 1 year ahead of a critical deadline. In December 2013—13 months before the deadline—the transformer failed during testing in the factory. This resulted in an initial 4-month delay to the expected delivery date. The transformer was rebuilt and delivered to the site, but was compromised due to contamination. This required returning the transformer to the factory for further inspection and corrective measures. In the factory, the

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143 FERC ¶ 61,147, *reh'g denied*, 144 FERC ¶ 61,113 (2013).

[23] CRS Report at 7. *See also* QER Report at 2-11 ("The loss of critical LPTs can result in disruptions to electricity services over a large area. Such a loss could be due to the customized nature of the components and the associated manufacturing requirements," as well as various threats to large transformers from attacks and natural phenomena).

> transformer was refurbished and ultimately passed factory testing 10 months after the original delivery date. Delivery to the site, final assembly, and onsite testing and commissioning was completed 1 year after the original scheduled in-service date. While the deadline for commercial operation was ultimately met, there was no room for error and significant uncertainty in the ability to meet the critical service deadline. The lack of off-the-shelf transformer options and industry practice of as-needed manufacturing is an ongoing concern.[24]

The current degree of customization, combined with just-in-time manufacturing practices,[25] means that current inventories of spare transformers may be insufficient. As an April 2014 DOE report explains:

> LPTs have long been a concern for the U.S. Electricity Sector, because the failure of a single unit can cause temporary service interruption and lead to collateral damage, and it could be difficult to quickly replace it. Key industry sources have identified the limited availability of spare LPTs as a potential issue for critical infrastructure resilience in the United States, and both the public and private sectors have been undertaking a variety of efforts to address this concern.[26]

CRS observed that "at $3-5 million per unit or more, maintaining large inventories of spare HV transformers solely as emergency replacements is prohibitively costly, so limited extras are on hand."[27]

The limited inventory of suitable replacement large power transformers and other transmission infrastructure, when combined with the long lead times required to manufacture large transformers, can lead to major delays in replacement of critical transmission infrastructure. According to DOE, the average lead time for a large transformer is "between five and 16 months; however, the lead time can

[24] QER Report at 2-12.
[25] *See* CRS Report at 4 ("Since [LPT] manufacturing generally occurs on a single production line with just-in-time component supplies, advanced production scheduling is important for managing delivery.")
[26] 2014 Transformer Report at vi.
[27] CRS Report at 7.

extend beyond 20 months if there are any supply disruptions or delays with the supplies, raw materials, or key parts. Its large size and weight can further complicate the procurement process, because an LPT requires special arrangements and special rail cars for transport."[28] The QER Report reiterates these concerns:

> due to their size and weight, moving LPTs presents logistical challenges requiring specialized equipment, permits, and procedures . . . . The United States has never experienced simultaneous failures of multiple high-voltage transformers, but such an event poses both security and reliability concerns. The Edison Electric Institute, seeking to manage such vulnerabilities, has established a Spare Transformer Equipment Program, enabling utilities to stockpile and share spare transformers and parts. The inventory under this program is not large enough, however, to respond to a large, coordinated attack. Transformer design variations and the logistical challenges associated with their movement pose additional challenges to maximizing the effectiveness of the program. A National Research Council study referring to this effort noted that ". . . The industry has made some progress toward building an inventory of spares, but these efforts could be overwhelmed by a large attack" and that "it alone is not sufficient to address the vulnerabilities that the United States faces in the event of a large physical attack."[29]

The long lead time for this equipment is due in part to production being dominated by overseas manufacturers. In 2010, only 15 percent of the Nation's demand for power transformers with a capacity rating of 60 MVA and above was met through domestic production, and "power transformer market supply conditions indicate that the Nation's reliance on foreign manufacturers was even greater for [extra high voltage] power transformers with a capacity rating of 300 MVA and above (or a voltage rating of 345 kV and above)."[30] Other reports

[28] 2014 Transformer Report at 31.
[29] QER Report at 2-11 (citations omitted).
[30] 2014 Transformer Report at 31.

reiterate these concerns.[31] Consequently, as the National Research Council's report on "Terrorism and the Electric Power Delivery System" and the recently issued QER Report both conclude, there is a need and an opportunity for the federal government to work with private industry to create shared stockpiles of large transformers and other long lead time transmission equipment to address widespread outages caused by any of the threats discussed above. [32] Grid Assurance responds to this identified need, as described below, by developing reserves of large transformers and other critical equipment in strategic locations that can be made available to subscribers on shorter timeframes than are currently available in order to respond to emergencies and unanticipated needs.

C. FERC Has Identified Resiliency as a Key Component of Physical Security Plans Under CIP-014-1

On March 7, 2014, the Commission directed NERC to "develop and file for approval proposed Reliability Standards that address threats and vulnerabilities to the

[31] *See, e.g.*, Oak Ridge National Laboratory, *Executive Summary of FERC EMP-GIC Metatech Reports 319-324*, at iii (Jan. 2010), *available at* http://web.ornl.gov/sci/ees/etsd/pes/pubs/ferc_Executive_Summary.pdf ("Damaged transformers require repair or replacement with new units. Currently most large transformers are manufactured in foreign countries and replacements would likely involve long production lead times in excess of a year. The long-term power outages associated with such a delay would pose unacceptable societal burdens."); CRS Report at 5 ("Today, there is limited manufacturing capacity in the United States for HV transformers. Five U.S. facilities state that they can manufacture transformers rated 345 kV or above, although it is not clear how many units in this range they have actually produced. Canada and Mexico have five additional HV manufacturing plants.").

[32] *See* National Research Council, Terrorism and the Electric Power Delivery System, at 6 (2012), *available at* http://www.nap.edu/openbook.php?record_id=12050&page=R1 ("the Department of Homeland Security should . . . [t]ake the lead and work with the DOE and with relevant private parties to develop and stockpile a family of easily transported high-voltage recovery transformers and other key equipment."); QER Report at S-13 ("DOE should coordinate with the Department of Homeland Security and other Federal agencies, states, and industry on an initiative to mitigate the risks associated with the loss of transformers. Approaches for mitigating this risk should include the development of one or more transformer reserves through a staged process.").

physical security of critical facilities on the Bulk-Power System."[33] The Commission stated that the development of physical security standards:

> will help provide for the resiliency and reliable operation of the Bulk-Power System. To that end, the proposed Reliability Standards should allow owners or operators to consider resilience of the grid in the risk assessment when identifying critical facilities, and the elements that make up those facilities, such as transformers that typically require significant time to repair or replace. As part of this process, owners or operators may consider elements of resiliency such as how the system is designed, operated, and maintained, and the sophistication of recovery plans and inventory management.[34]

In response, NERC petitioned the Commission to approve proposed Reliability Standard CIP-014-1 (Physical Security) to enhance physical security measures for the most critical Bulk-Power System facilities and thereby lessen the overall vulnerability of the Bulk-Power System against physical attacks.[35] In Requirement R5 of CIP-014-1, NERC proposed to require each transmission owner and transmission operator to develop and implement documented physical security plans that cover each of their critical transmission stations, substations, and control centers.

On July 17, 2014, the Commission proposed to approve Reliability Standard CIP-014-1, with minor modifications. The Commission observed that CIP-014-1 takes a flexible approach with respect to the specific resiliency measures that utilities may elect to incorporate into the required physical security plans. The Commission cautioned, however, that

> [r]esiliency is as, or even more, important than physical security given that physical security cannot protect against all possible attacks. In the case of the loss of a substation, the Bulk-Power System may depend on resiliency to minimize the impact of the loss of facilities and restore blacked-out

[33] *Reliability Standards for Physical Security Measures*, 146 FERC ¶ 61,166, at P 5 .
[34] *Id.* at P 7.
[35] *See Physical Security Reliability Standard*, 148 FERC ¶ 61,040, at P 9.

> portions of the Bulk-Power System as quickly as possible. Some entities may implement resiliency measures rather than security measures, such as by adding facilities or operating procedures that reduce or eliminate the importance of existing critical facilities. Such measures could significantly improve reliability and resiliency.[36]

The Commission approved Reliability Standard CIP-014-1 on November 20, 2014.[37] This standard will become effective October 1, 2015.[38]

D. Access to Sparing Services Will Support Competition Among Transmission Developers Under Order No. 1000

The Commission's policies under Order No. 1000 for identifying regional and interregional solutions that are more efficient and cost effective can be supported by the availability of Grid Assurance's sparing service that makes equipment available to all subscribers, including new entrant transmission developers, in the event of a Qualifying Event. Many Order No. 1000 regions have adopted criteria, whether for developer qualification or project selection purposes, that consider the developer's capability and plans for replacing and restoring equipment.

For example, the Midcontinent Independent System Operator, Inc. ("MISO") planning protocol provides that a **"**Qualified Transmission Developer Applicant" must submit documentation that demonstrates that it possesses or can obtain sufficient capabilities and competencies to adequately perform operations, maintenance, testing, inspection, repair, and replacement tasks once a regional project is in service and part of the Transmission System. Such tasks include: "[m]aintenance and management of spare parts, spare structures, and/or spare equipment inventories for substations and/or

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[36] *Id.* at P 55.
[37] *Physical Security Reliability Standard,* Order No. 802, 149 FERC ¶ 61,140 (2014).
[38] *See id.* at PP 113-116 (approving NERC's implementation schedule which calls for an effective date of CIP-014-1 on the first day of the first calendar quarter that is six months beyond the effective date of Order No. 802).

transmission lines, as applicable, including description of any agreements to share spare equipment, spare parts, and/or spare structures with other transmission entities."[39] In the planning provisions of the PJM Interconnection, L.L.C. tariff, the "Entity-Specific Criteria Considered in Determining the Designated Entity for a Project" include "capability of the entity to adhere to standardized construction, maintenance, and operating practices, including the capability for emergency response and restoration of damaged equipment."[40] Under the California Independent System Operator ("CAISO") tariff, the developer application asks for information such as: the developer's capability and experience that will enable it to comply with the activities required by the Transmission Control Agreement's provisions regarding management of emergencies and system emergency reports; "resources available . . . to respond to major problems on the proposed project[,] [i]nclud[ing] resources available through mutual assistance agreements;" expected response times of such resources; and samples of emergency operating plans.[41] Similar criteria also apply in some non-RTO regions.[42]

Grid Assurance plans to offer sparing service to any transmission owners that enter into the standardized Subscriber Agreement. Thus, new entrants seeking to compete for transmission projects could choose to procure sparing service for Qualifying Events from Grid Assurance. This option may be a cost effective approach for new

[39] MISO, Open Access Transmission Tariff at Attachment FF, Transmission Expansion Planning Protocol § VIII.B.5(9), Version 39.0.0. (effective Jan 1, 2015).
[40] PJM Operating Agreement, Schedule 6, Procedure for Development of the Regional Transmission Expansion Plan § 1.5.8(f), Version 6.2.0 (effective Nov. 22, 2014).
[41] CAISO Developer Application at 39, *available at*: http://www.caiso.com/Documents/TransmissionProjectSponsorApplication.doc.
[42] *See, e.g.*, Alabama Power Company, *et al.* (Southern Companies) Open Access Transmission Tariff, Attachment K, The Southeastern Regional Transmission Planning Process, §§ 16.1 and 17.3, Version 4.0.0 (effective June 1, 2014).

entrants and incumbent transmission owners alike to demonstrate that they can perform necessary emergency response and restoration functions.

IV. DESCRIPTION OF PETITIONER AND SPARING SERVICE

A. Grid Assurance LLC

Grid Assurance is a Delaware limited liability company which has been formed to support the rapid restoration of electric service in the event of certain types of foreseeable catastrophes by providing greater accessibility and timely deployment of spare transmission equipment.[43] Grid Assurance plans to provide services on a subscription basis pursuant to a standardized Subscriber Agreement it will execute with its subscribers.

To provide subscribers with ready domestic inventory of otherwise long lead-time critical spares and to manage that inventory efficiently, Grid Assurance will own and maintain spare equipment which will be stored at strategically located regional warehouses around the country. Grid Assurance plans to provide logistics support to assist subscribers with transporting equipment to subscriber sites as expeditiously as possible after the occurrence of a Qualifying Event.

B. Sparing Service Provided to Subscribers

Grid Assurance will (1) maintain an inventory of critical spare transformers, circuit breakers and related transmission equipment optimized for the collective resiliency needs of its subscribers, (2) provide secure domestic warehousing of the

[43] American Electric Power Company, Inc., BHE U.S. Transmission, LLC, Edison Transmission, LLC, Eversource Energy, Exelon Corporation, KLT, Inc., and Southern Company Services, Inc., are involved in the development of the Grid Assurance business model, and these companies, or their affiliates, may consider equity investments in Grid Assurance. Additional electric utility sector entities may also become investors in Grid Assurance.

inventory of spares in strategic locations, and (3) release inventory of spares to utility subscribers as needed to respond to a Qualifying Event. Grid Assurance will provide this "sparing service" to any transmission owner that enters into a standardized Subscriber Agreement with Grid Assurance. Under the Subscriber Agreement, each subscriber will be entitled to purchase inventory from Grid Assurance if it suffers a Qualifying Event. Upon any such purchase, Grid Assurance plans to assist with delivery logistics or may offer an optional delivery service; in all events, subscribers will be responsible for installing the equipment and restoring service.

Grid Assurance's sparing service will provide the following distinct benefits to its subscribers:

1. Diversification: By optimizing inventory to the resiliency needs of a large group of subscribers, each subscriber's share of the cost of access to inventory will be minimized. Thus, this approach is expected to be more cost-effective than utility-by-utility sparing strategies.
2. Economies of Scale: Grid Assurance will seek to take advantage of volume purchases to obtain favorable pricing on equipment supply and maintenance agreements.
3. Secure Storage and Management of Inventory: Grid Assurance will store the equipment at secure, strategically-located warehouses and contract with equipment manufacturers to periodically test, service and maintain equipment in inventory.
4. Improved Logistics: Grid Assurance will establish warehouses strategically located to maximize efficiency of delivery. Grid Assurance will perform ongoing logistics planning and maintain expertise in large asset transportation, including intermodal transportation for inbound and outbound inventory. It will also procure access to specialized transportation equipment (*e.g.*, Goldhoffers, Schnabel Cars, deck barges, dedicated boats, low boys, and cranes).

C. Subscribers

Grid Assurance will provide sparing service to transmission owners that enter into the Subscriber Agreement. Subscription will be available to transmission owners and

transmission developers in the United States or Canada, including investor-owned utilities, government-owned utilities, rural electric cooperatives and merchant transmission companies. All subscribers, whether or not affiliated with a Grid Assurance owner,[44] will be entitled to the same quality and terms of Grid Assurance service pursuant to the standard Subscriber Agreement.

Subscribers will have the right to purchase equipment from the Grid Assurance inventory upon the occurrence of a Qualifying Event. Subscribing to the Grid Assurance sparing service will be voluntary.

D. The Subscriber Agreement

The standardized Subscriber Agreement under development will specify all of the rights and obligations of Grid Assurance and each subscriber, and is expected to address the following terms:

- A definition of the circumstances that will constitute a Qualifying Event;
- The process for each subscriber to designate the transmission equipment it wishes to have covered by the sparing service;
- The process for purchasing equipment from Grid Assurance inventory (pursuant to a standard form of equipment purchase agreement) and establishing the purchase price for such equipment;
- Transparent formulae for calculating each subscriber's fee based on Grid Assurance's costs;
- The rights of subscribers to access and audit Grid Assurance's cost information;
- The process for subscriber withdrawal from Grid Assurance participation;
- The manner of inventory disposition in circumstances other than a Qualifying Event;

[44] Affiliates of the Grid Assurance owners may be among Grid Assurance's initial subscribers. Once the terms and conditions of the Subscriber Agreement are known in greater detail, Grid Assurance expects to make a future filing with the Commission to address any necessary declarations or waivers concerning affiliate pricing restrictions under Section 35.44 of the Commission's regulations.

- Limitations of liability; and
- Mechanisms for communications between subscribers and Grid Assurance management.

Each subscriber will pay a periodic subscription fee which will be equal to its allocated share of Grid Assurance's cost of operation. It is anticipated that Grid Assurance's cost of operation will be determined using a cost-based, transparent formula that will include a return on, and a return of, invested capital and recovery of operating costs, expenses, and taxes. The Subscriber Agreement will also establish the pricing at which inventory will be sold to subscribers following a Qualifying Event, which is expected to be based on Grid Assurance's cost for such equipment.

E. Relationship to Existing Spare Transformer Equipment Program

The Edison Electric Institute's Spare Transformer Equipment Program ("STEP") was an important and valuable first step in anticipating the types of sparing needs that increasingly face the electricity sector.[45] The sparing services to be offered by Grid Assurance will complement, but will be significantly broader than, the equipment sharing under STEP.

Grid Assurance will offer transmission owners a more comprehensive service than that offered through participation in STEP. The equipment covered by STEP is limited to transformers and limited to certain voltage classes. In contrast, Grid Assurance will maintain an inventory of long-lead-time transmission equipment[46] – including more than just transformers – and the inventory will be tailored to the collective resiliency

[45] *See Edison Electric Institute*, 116 FERC ¶ 61,280 (2006).

[46] The inventory is expected to include, for instance, transformers, circuit breakers, phase angle regulators, shunt reactors, instrument transformers, recovery transformers, mobile transformers, mobile stations, control modules, bushings, coolers, conductors, and temporary towers. Decisions about what to hold in inventory will be driven predominantly by subscriber needs.

needs identified by Grid Assurance subscribers. Under STEP, the contractual sharing obligation is limited to narrowly defined triggering events that require the President to declare a national emergency following an act of terrorism.[47] Grid Assurance inventory will be available to subscribers responding to a full range of attacks, natural disasters and other emergency circumstances. Grid Assurance inventory will be stored in secure regional warehouses that will be strategically located. Grid Assurance will provide logistics support for delivery of spares from warehouses to subscribers when called upon and may provide optional delivery services upon request.

V. PETITION FOR DECLARATORY ORDER

To be successful, Grid Assurance must achieve a critical mass of subscribers to support cost-effective investment in equipment inventory and storage infrastructure. Broad participation will result in efficiencies and economies of scale that will benefit subscribers and enhance overall grid resilience. Grid Assurance asks the Commission to acknowledge the benefits offered by this type of sparing service model as a means for cost-effectively supporting grid resilience, and further asks the Commission to make the following declarations to address regulatory uncertainties for the benefit of potential Grid Assurance subscribers.

[47] No spares have been exchanged under the contractual obligations in STEP since its inception in 2006.

A. Contracting With Grid Assurance For Access to Spare Equipment Is a Permissible Resiliency Element of a Physical Security Plan Under Requirement R5 of Reliability Standard CIP-014-1.

On November 20, 2014 the Commission issued Order No. 802 approving Reliability Standard CIP-014-1.[48] Requirement R1 of the standard requires transmission owners to perform a series of risk assessments to "identify the Transmission station(s) and Transmission substation(s) that if rendered inoperable or damaged could result in widespread instability, uncontrolled separation, or Cascading within an Interconnection."[49] Requirement R5 of CIP-014-1 requires transmission owners to "develop and implement a documented physical security plan(s) that covers their respective Transmission station(s), Transmission substation(s), and primary control center(s)" identified in R1.[50] The physical security plan must include "[r]esiliency or security measures designed collectively to deter, detect, delay, assess, communicate, and respond to potential physical threats and vulnerabilities."[51] The Commission has recognized that as part of the physical security process, transmission owners may consider elements of resiliency such as "the sophistication of recovery plans and inventory management."[52]

The Commission should clarify that contracting with Grid Assurance for sparing service for critical transmission equipment could be one means to address resiliency in

[48] Order No. 802, 149 FERC ¶ 61,140 (2014).
[49] NERC, Reliability Standards for the Bulk Electric Systems of North America, CIP-014-1, Physical Security at 3 (June 5, 2015), *available at*: http://www.nerc.com/pa/Stand/Reliability%20Standards%20Complete%20Set/RSCompleteSet.pdf.
[50] *Id*. at 6.
[51] *Id*.
[52] Order No. 802, 149 FERC ¶ 61,140 at P 60 (quoting *Reliability Standards for Physical Security Measures*, 146 FERC ¶ 61,166 at P 7).

connection with a compliant physical security plan under CIP-014-1. As described above, contracting with Grid Assurance will make available to a transmission owner an inventory of critical spare equipment, including equipment capable of replacing the subscriber's critical assets identified in Requirement R1 of CIP-014-1 in the event equipment is damaged during a Qualifying Event. The spare equipment will be stored in secure, strategically located warehouses and will be made available to subscribers following a Qualifying Event. The Commission should declare that a transmission owner subject to Requirement R5 of CIP-014-1 may use a Grid Assurance subscription contract for sparing service as a resiliency element of its physical security plan.

B. Authorization Under FPA Section 203 Is Not Required for Subscribers to Purchase Spare Equipment from Grid Assurance Following a Qualifying Event.

The Commission should also declare that acquisition by public utility subscribers of spare equipment from Grid Assurance does not require authorization under Section 203 of the FPA. Section 203(a)(1) provides:

> No public utility shall, without first having secured an order of the Commission authorizing it to do so –
>
> > (A) sell, lease, or otherwise dispose of the whole of its facilities subject to the jurisdiction of the Commission, or any part thereof of a value in excess of $10,000,000;
> >
> > (B) merge or consolidate, directly or indirectly, such facilities or any part thereof with those of any other person, by any means whatsoever; . . . .[53]

Section 203(a)(1) applies only to dispositions or consolidations of "facilities subject to the jurisdiction of the Commission." Transmission facilities that are not in service are

[53] 16 U.S.C. § 824b(a)(1).

not facilities subject to the Commission's jurisdiction.[54] Thus, Section 203(a)(1) does not apply to transfers of spare transmission equipment that is not yet energized. The Commission does not require a utility to seek authorization under FPA Section 203 when it purchases transmission equipment from a manufacturer that it intends to place into service, or from a distributor of such equipment. The Commission should not extend a requirement to obtain Section 203 prior authorization to acquisitions of unenergized transmission equipment from other intermediaries in the supply chain that supply sparing services. Thus, the Commission should declare that the transfer of spare transmission equipment from Grid Assurance to a public utility subscriber does not require prior authorization under Section 203 of the FPA. The goal of rapid restoration of the grid following a Qualifying Event would not be well-served by requiring prior Section 203 authorization before replacement equipment can be transferred from Grid Assurance to its subscribers. Clarification from the Commission on this issue will benefit potential Grid Assurance subscribers by reducing regulatory uncertainty associated with a purchase of spare transmission equipment.

[54] *New York Transco, LLC, et al.*, 151 FERC ¶ 61,005 at P 16 (2015) ("Under Commission precedent, transmission facilities that are not in service are not subject to the Commission's jurisdiction. . . . [T]he facilities that Applicants propose to transfer pursuant to the Proposed Transactions are not and will not be in service at the time of closing and therefore are not subject to the Commission's jurisdiction under FPA section 203.")

VI. CONCLUSION

For the reasons set forth above, Grid Assurance respectfully requests that the Commission issue an order containing the declarations requested herein. Grid Assurance also requests that the Commission grant expedited treatment for this Petition and issue an order granting Grid Assurance's request within 60 days from the date of this filing.

Respectfully submitted,

/s/ Douglas W. Smith

Douglas W. Smith
Justin P. Moeller
Van Ness Feldman, LLP
1050 Thomas Jefferson St., NW
Washington, DC 20007
Phone: (202) 298-1800
Fax: (202) 338-2361
dws@vnf.com
jpx@vnf.com

Counsel to Grid Assurance LLC

June 9, 2015

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