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February 23, 2015

The Honorable City Council  
c/o Office of the City Clerk  
Room 395, City Hall  
Mail Stop 160

Attention: Councilmember Felipe Fuentes  
Chair, Energy and Environmental Committee

Honorable Members:

Subject: Los Angeles City Council (Council) File No. 14-1690, Los Angeles Department of Water and Power's (LADWP's) Report on Security Practices Related to Power Grid Vulnerabilities

This is in response to the Energy and Environment Committee's Motion (Council File No. 14-1690), dated December 9, 2014, which addresses a request to report on security practices related to power grid vulnerabilities, including:

- The degree to which the electric utility properties and equipment (the power grid) are subject to damage from these vulnerabilities, the time spans and costs necessary for repair of such damage, and the impact such damage would inflict on the ability of the citizens, businesses, and governmental agencies to function in support of life, health, public safety, and economic advancement of the City of Los Angeles (City) and surrounding region;
- The standards used to prepare or protect the power grid from such vulnerabilities;
- The methods available to prepare or protect the power grid from such vulnerabilities, their costs, and their feasibilities;
- Practical and safe guidance as to how an individual utility customer, or a neighborhood, may be able to prepare for such emergencies as the inability of the LADWP to maintain service in the event of failures caused by these vulnerabilities, and how the City could contribute to individual or neighborhood preparations;
- A comparison of the relative grid security and safety to residents of LADWP's service area by providing local renewable distributed generation sources and microgrids versus central station out-of-basin power generation.

**Los Angeles Aqueduct Centennial Celebrating 100 Years of Water 1913-2013**

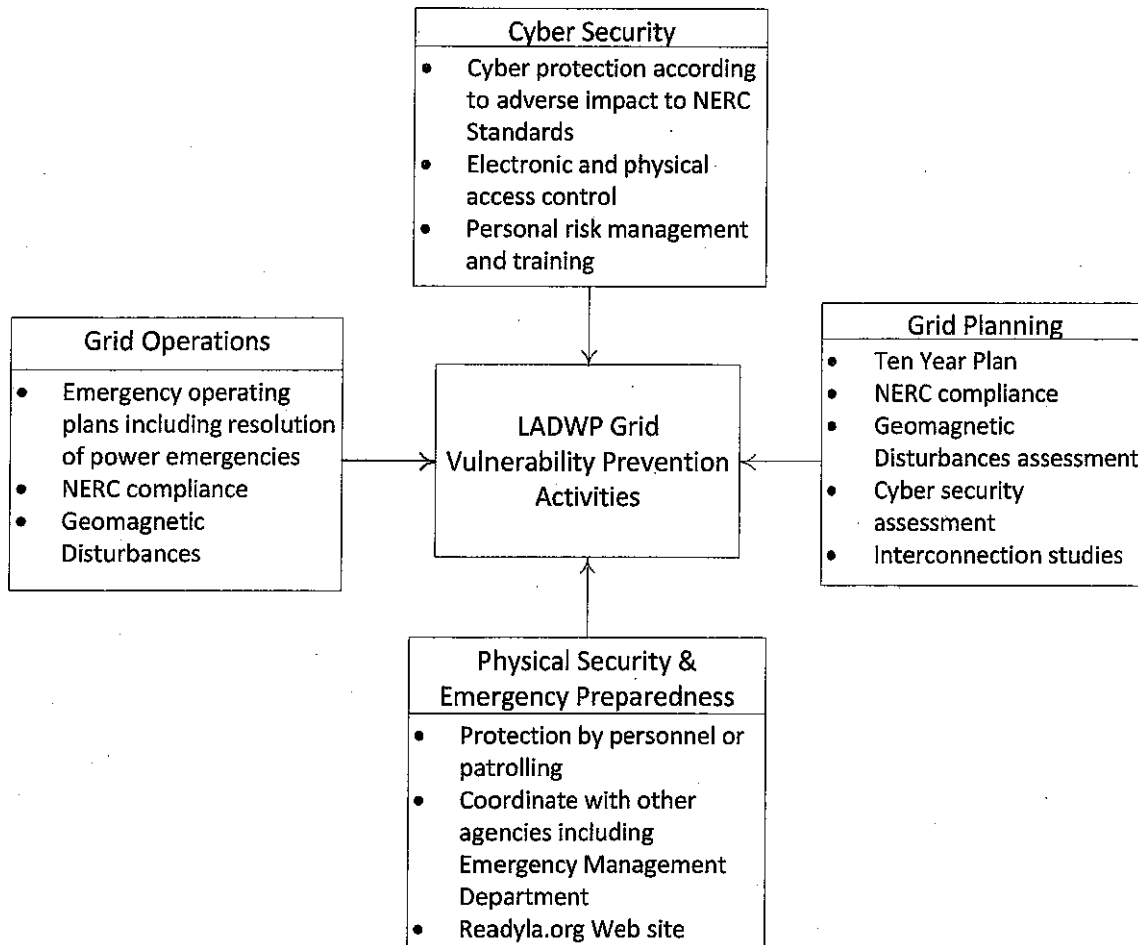
111 N. Hope Street, Los Angeles, California 90012-2607 Mailing address: Box 51111, Los Angeles, CA 90051-5700  
Telephone: (213) 367-4211 www.LADWP.com

**LADWP – A Summary on Power Grid Reliability**

The motion requests information on potential vulnerabilities LADWP power grid, and activities to prevent impacts to the reliability of the power system.

LADWP adheres to the reliability standards that are developed by NERC and mandated by FERC. These standards include the protection of critical infrastructure, including measures of cyber security.

While national and regional operating standards require certain levels of confidentiality on these topics, the LADWP's approach is explained in accordance to those security standards and how they apply to reliability of the power grid. The following is a description of the functions of four entities at LADWP that work to prevent or reduce power grid vulnerabilities:



### **Grid Planning and Development (Grid Planning)**

LADWP performs assessments each year to model and evaluate the operating conditions of the transmission system for the next 10 years. Included in those studies are a variety of scenarios that could impact the transmission system such as high temperatures or transmission line outages. These studies demonstrate the redundancy and robustness of the LADWP transmission system. It will continue to provide power to its customers despite experiencing some outages at the transmission level. These studies are technically rigorous and are performed by LADWP engineering and operations staff in accordance with national and regional electric utility reliability standards. The LADWP is accountable to these reliability agencies including, the North American Electric Reliability Corporation (NERC) and the Western Electricity Coordinating Council (WECC).

From these studies, the LADWP is able to identify any necessary short- or long-term upgrades on the transmission lines to continue providing power to its customers. LADWP also performs interconnection studies for new business projects and coordinates with neighboring utilities for any potential impacts or disturbances to the system.

In addition to studying the various transmission lines, LADWP also performs risk assessments of the LADWP transmission stations (existing and planned to be in service within 24 months) that are deemed critical to the reliability of the system. This study is performed based on the requirements and guidance of the recently approved NERC Physical Security Standards. These standards are identified under the NERC's Critical Infrastructure Protection (CIP) rules.

In addition, LADWP is working with NERC and WECC organizations in the development of reliability standards that address the potential impact of geomagnetic disturbances (GMDs) on the high voltage power system. Due to the geographical location of LADWP in the more southern latitudes, the probability of a GMD event occurring in LADWP facilities is extremely low, if any; however, LADWP complies with the requirements of NERC Reliability Standards associated with impacts of GMD events.

### **Grid Operations**

The LADWP operates the Bulk Electric System (BES) in compliance with all NERC and WECC Standards. Specifically, NERC Standard EOP-001 requires LADWP to develop, maintain, and implement a set of plans to mitigate (prevent or remedy) operating emergencies. NERC Standard TOP-004 requires LADWP to operate within System Operating Limits at all times so that instability, uncontrolled separation, or cascading outages will not occur as a result of the most severe single contingency or from multiple contingencies as specified by its Reliability Coordinator.

The LADWP Capacity and Energy Emergency Plan is written in order to promote the safe and reliable operation of the power system and to provide a guide for actions following system disturbances including equipment failure and power overloads. This plan is reviewed each calendar year or more frequently, where required or needed. Load dispatching personnel

receive Emergency Operations training on all aspects of the plan yearly or more frequently as required by NERC and WECC Standards.

A NERC Standard EOP-010 deals with GMD and details the operating response in the event of a GMD.

### **LADWP Cyber Security**

LADWP adheres to the CIP Reliability Standards developed by NERC and mandated by Federal Energy Regulatory Commission (FERC). These standards support the reliable operation of the BES by protecting associated cyber systems from threats and vulnerabilities. LADWP has taken several measures to prevent or mitigate potential cyber attacks.

Personnel risk assessment, training, and security awareness help minimize the risk against compromise from individuals who have access to cyber assets. Electronic and physical access is controlled and monitored. Strong technical and operational procedures enhance system security. A cyber security incident response plan is in place to mitigate a potential incident and expedite the recovery of reliability functions.

Sensitive cyber system information is protected from unauthorized access through security management controls and reviews. A multi-layered approach is used to protect transmission stations, substations, generation resources, special protection systems, and control centers. Security management controls establish responsibility and accountability to protect these systems. LADWP's Cyber Security Program continues to mature as the NERC CIP Standards are updated and the industry develops new methods to mitigate and prevent cyber attacks.

LADWP is in regular communication with NERC, WECC, and the electric utilities on current cyber events and cyber security matters.

### **LADWP Physical Security and Emergency Preparedness**

The LADWP Security Services Division is responsible for the protection of the physical security of the power grid which includes generation stations, receiving and distribution stations, transmission lines, solar farms and wind farms. Security Services either posts personnel at these locations or conducts patrols utilizing vehicles or helicopters to prevent unauthorized intrusions or spot suspicious activity. Additionally, Security Services monitors video and alarm feeds from local and remote cameras to identify and respond to crimes in progress.

Security Services continually coordinates with local law enforcement for extra patrol and to ensure a rapid response to unfolding situations. In addition to working with local law enforcement, they also coordinate with the United States Department of Homeland Security and Federal Bureau of Investigation to monitor threats against the Power System and ensure a comprehensive investigation is conducted when a crime or attack occurs against LADWP assets.

The cost of compliance with the security measures are embedded in the ongoing operation and maintenance activities.

### **Guidance to Customers**

With respect to providing practical and safe guidance to our customers so they are able to prepare for emergencies related to loss of power, the LADWP Office of Emergency Management works closely with the City Los Angeles Emergency Management Department. LADWP reminds all customers and residents of the City to visit the [ReadyLA.org](http://ReadyLA.org) Web site. This site provides information related to having a disaster plan that addresses the possible hazards and disasters that may affect Los Angeles. In addition, customers are also encouraged to have an emergency preparedness kit as a part of their disaster plan and have sufficient supplies at home to sustain a family for at least three days.

### **Conclusion**

While electric utilities cannot say there will never be a power outage, the national and regional agencies continue to work together on identifying and reducing the vulnerabilities of the power grid as noted by a sampling of the operating standards that have been referenced in the above notes. By working together towards effective and efficient solutions, LADWP customers enjoy a highly reliable power system.

If you have any questions or require further information, please call me at (213) 367-1338, or you may have your staff contact Ms. Winifred J. Yancy, Director of Intergovernmental Affairs and Community Relations, at (213) 367-0025.

Sincerely,



Marcie L. Edwards  
General Manager

PC:ps

- c: The Honorable Bob Blumenfield, Vice-Chair, Energy and Environment Committee
- The Honorable Jose Huizar, Member, Energy and Environment Committee
- The Honorable Paul Koretz, Member, Energy and Environment Committee
- The Honorable Tom LaBonge, Member, Energy and Environment Committee
- Board of Water and Power Commissioners
- Ms. Winifred J. Yancy

14-1690

MOTION ENERGY & ENVIRONMENT

The Los Angeles Department of Water and Power (LADWP) provides essential utility services to the City of Los Angeles, including a reliable grid. Reliability of the power grid is critical to life, health, public safety, and economic advancement of the City and surrounding region.

Electric utility properties and equipment are distributed over a large region and there may be vulnerabilities to this equipment including but not limited to: extraordinary solar flares creating damaging Electromagnetic Pulse (EMP) effects, geomagnetic disturbances, nuclear and non-nuclear EMP weapons, physical attacks, cyber attacks, equipment failures, and power overloads.

Additionally, the 2014 United Nations International Panel on Climate Change report warns that we are irreversibly on course to trigger the 3.6 degree Fahrenheit (2 degrees Celsius) global temperature tripwire that will "increase the likelihood of severe, pervasive and irreversible impacts for people and ecosystems," including more and worse extreme storm events, like those which have already been leaving affected areas without power sometimes for weeks.

It is important that LADWP maintain the historical reliability of the power system and address the power grid vulnerabilities described.

I THEREFORE MOVE that, within the provisions or limitations of prudent security practices, the LADWP report to the Energy and Environment Committee within 60 days on:

- The degree to which the electric utility properties and equipment (the power grid) are subject to damage from these vulnerabilities, the time spans and costs necessary for repair of such damage, and the impact such damage would inflict on the ability of the citizens, businesses, and governmental agencies to function in support of life, health, public safety, and economic advancement of the City and surrounding region;
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- Practical and safe guidance as to how an individual utility customer, or a neighborhood, may be able to prepare for such emergencies as the inability of the LADWP to maintain service in the event of failures caused by these vulnerabilities, and how the City of Los Angeles could contribute to individual or neighborhood preparations;
- A comparison of the relative grid security and safety to residents of LADWP's service area by providing local renewable distributed generation sources and microgrids versus central station out-of-basin power generation.

PRESENTED BY: Paul Koretz  
PAUL KORETZ  
Councilmember, 5th District

SECONDED BY: [Signature]

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DEC 09 2014

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ORIGINAL