BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking Regarding Policies Procedures and Rules for the California Solar Initiative, the Self-Generation Incentive Program and Other Distributed Generation Issues.	Rulemaking 12-11-005 (File November 8, 2012)

RESPONSE OF PACIFIC GAS AND ELECTRIC COMPANY (U 39 E) TO THE ASSIGNED COMMISSIONER'S RULING REGARDING THE INTERCONNECTION OF ENERGY STORAGE SYSTEMS

RANDALL J. LITTENEKER
STACY W. WALTER

Pacific Gas and Electric Company
77 Beale Street, B30A
San Francisco, CA 94105
Telephone: (415) 973-6611
Facsimile: (415) 973-0516
E-Mail: sww9@pge.com

Attorneys for
PACIFIC GAS AND ELECTRIC COMPANY

January 8, 2014

TABLE OF CONTENTS

Page

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking Regarding Policies Procedures and Rules for the California Solar Initiative, the Self-Generation Incentive Program and Other Distributed Generation Issues.	Rulemaking 12-11-005 (File November 8, 2012)

RESPONSE OF PACIFIC GAS AND ELECTRIC COMPANY (U 39 E) TO THE ASSIGNED COMMISSIONER'S RULING REGARDING THE INTERCONNECTION OF ENERGY STORAGE SYSTEMS

I. INTRODUCTION

Pacific Gas and Electric Company (PG&E) makes this filing in response to the *Assigned Commissioner's Ruling Regarding the Safety Considerations for Interconnection of Energy Storage Systems Paired with Renewable Generators Eligible for Net Energy Metering* issued on January 6, 2014 (ACR). This ACR expands on the questions included in the December 10, 2013 email from California Public Utilities Commission (CPUC) President Michael Peevey's advisor, Scott Murtishaw. Safety is the focus of these additional CPUC questions regarding the interconnection of storage. This is a very important topic and PG&E supports the CPUC's efforts to further investigate the sufficiency of existing interconnection rules in preserving safety and reliability.

II. QUESTIONS AND ANSWERS

PG&E appreciates the opportunity to discuss these important safety-related issues for customer-generated storage. PG&E addresses each of the seven questions included in the ACR below.

Question 1. Are there any safety or reliability concerns associated with the interaction of customer-side energy storage with the utility grid that are *not* currently being addressed through Rule 21?

Response 1. In PG&E's view, the current Rule 21 provides the framework and requirements to allow for the safe interconnection of storage. However, PG&E has identified three areas where the rule could be improved to better address storage interconnection issues.

First, customer-side storage inverters may have multi-mode capability and should be studied and certified based on all available possible use-cases in order to evaluate its impact on the utility system. Specifically, the requirements for the transition between stand-alone mode and grid interactive mode do not currently have sufficient detail in UL-1741 and the standard is currently being refined to better address storage inverters.[1/] Accordingly, there should be coordination between the effort to improve the UL-1741 certification standards and the Rule 21 process.

Second, Rule 21 does not permit inverters to operate in parallel with the grid while in the stand-alone mode since this mode is inherently in conflict with the anti-islanding requirements of Rule 21. Those storage devices planning to be able to transition from parallel operation to non-parallel (stand-alone) operation would require active examination as part of the Rule 21 interconnection process to ensure safe transition and interaction with the grid.

Lastly, any customer-side interconnection storage standards should provide flexibility as the industry progresses. PG&E strongly encourages the Commission to investigate opportunities to create processes specifically for customer-side storage projects (such as Fast Track screens) to address the unique characteristics of storage. PG&E would like to work with the Commission to

---

[1/] This issue will be addressed by the UL 1741 Standard Technical Panel.

develop a clear path for customer-side storage projects to interconnect in a timely and, most importantly, safe manner.

Question 2. If certified equipment is used, should any other protections be required that would prevent a customer from tampering with the equipment, potentially compromising the anti-islanding or other safety features installed on the device?

Response 2. There are certain restrictions in place under existing UL 1741 standards that prevent customers from changing inverter settings without notification. UL 1741 section 40.3 states: "For a utility-interactive inverter or interconnection system equipment (ISE) with field adjustable trip limits and trip times, the controls shall be accessible to service personnel only." Typically, the service personnel will not make any changes without a letter from the utility authorizing the change. The manufacturer is at risk of losing its certification by changing the settings from the factory default settings without utility authorization.

However, due to the multi-mode functionality in storage inverters, there may be a higher likelihood of customers seeking to adjust the inverter to adapt to various local use cases. Therefore, a new communication standard should likely be developed and all potential use-cases should be discussed with the utility prior to interconnection.

Question 3. There appear to be three types of safety concerns related to the interaction of the energy storage device within the home/business environment: a) fire hazards, due to overheating or exposure to open flames, b) electric shock hazards to emergency responders, and c) containment of hazardous materials in the event of fire or other disasters. To what extent does Rule 21, and the equipment certifications required therein, address these safety concerns?

Response 3. Safety is the most important aspect of PG&E's business practices and all interconnection applicants are required to meet all standards in the Rule 21 provisions. Also, all

certification standards under development should take into account the unique safety features specific to energy storage across the wide range of potential types of energy storage projects. In general, Rule 21 is designed to provide for a safe and reliable interconnection of the Customer Generating Facility with the utility grid and provides for an examination of the customer's technology to operate in parallel with the grid including interconnection, operational and metering requirements. In addition to the certification process such as UL1741 discussed above, the utility also relies on the permit approvals of the city, county or other entity with jurisdiction since they inspect as the project is in various stages of construction to make sure all applicable safety standards are met.

The hazards identified in this question such as fire hazards, electric shock to first responders, and containment of hazardous materials should be addressed directly in the safety certification of the equipment and in the permit approval requirements for the project. This is very important because in addition to the reviews and studies PG&E undertakes to ensure safe parallel operations, PG&E relies on certification standards and local county or city agencies to make sure the hazards identified in this question are adequately addressed.

Question 4. As part of the Rule 21 interconnection application process NEM applicants are required to provide evidence of the final electric inspection clearance from the governmental authority having jurisdiction over the generating facility. Does this provision typically involve every relevant regulatory and permitting authority that needs to be notified of the installation, such as local fire districts?

Response 4. PG&E relies upon the permitting authority with jurisdiction over the installation to confirm that the Generating Facility has been installed according to all applicable standards.

Depending on who the applicant is, the permitting authority could be the city or county with jurisdiction, or in the case of public facilities, the Division of the State Architect.

Additionally, some public facilities, such as community colleges and universities, submit a "Letter in Lieu" from the appropriate State or Federal department responsible for reviewing the facility to meet the inspection clearance requirement and confirming that all safety requirements on the customer's site are met. As part of this process it is up to the governmental entity with jurisdiction over the installation of the project to guarantee that notices regarding the installation of the Generating Facility have been properly provided consistent with the City and or County requirements.

Question 5. Are there different safety requirements currently in place for solar PV that are not required for energy storage and that could be easily modified for application to storage projects? Examples may include clear labeling and accessible manual disconnects for emergency responders.

Response 5. Energy storage should be required to have all applicable safety requirements as solar PV under the Rule 21 framework. For example, energy storage devices, by definition, store energy which could be accidentally discharged during an emergency situation if not properly disconnected from the grid and therefore need to have similar disconnect requirements as PV systems.

However, it is important to note that energy storage, depending on the technology used, could require enhanced protections by certification entities. Unique characteristics to energy storage, such as specific chemical compositions may pose higher risks and should be carefully considered as part of the equipment certification process by the appropriate certification agency. For example, lead-acid battery may release hydrogen gas during charging and need proper

ventilation. PG&E looks to the appropriate authority to provide the necessary approval for the safe operation of energy storage systems.

Question 6. Do existing rules and procedures address the use of used battery devices for energy storage? For example, if an electric vehicle battery is placed in service for stationary storage, will it be required to meet different UL certification standards?

Response 6. PG&E is unaware of existing rules and procedures that specifically address the use of used battery devices for energy storage. Additionally, PG&E is unaware of any single standard that certifies and type tests batteries to the extent that UL-1741 currently does for PV inverters. Each battery application may be slightly different and may need to be engineered for that particular application. As with any engineered system, it is the responsibility of the developer and/or owner to ensure the battery system is designed and installed properly and safely. These installations must comply with the National Electric Code and other applicable safety requirements. Confirming that storage installations on the customer side of the meter comply with all safety requirements is a critical aspect of the review and approval completed by the city and/or county inspectors.

Question 7. If the existing rules and procedures do not adequately address the safety impacts of energy storage, what are the appropriate roles of the CPUC, utilities, local government agencies or other state agencies to develop and implement improved safety standards? How can the CPUC help improve the coordination among the various agencies and permitting authorities involved to increase procedural efficiency?

Response 7. PG&E strongly encourages coordination among the various agencies and looks forward to participating in any future rulemaking regarding safety.

PG&E also looks forward to continuing to work with storage developers to review and approve any specific design for interconnection through the Rule 21 interconnection process and to investigate ways to streamline the interconnection process for repeat installations of the same design in the future.

III. CONCLUSION

PG&E appreciates the opportunity to provide these responses to the questions regarding storage interconnections and supports the CPUC's effort to further review this important area.

Respectfully submitted,

RANDALL J. LITTENEKER
STACY W. WALTER

By: /s/ *Stacy W. Walter*
STACY W. WALTER

Pacific Gas and Electric Company
77 Beale Street, B30A
San Francisco, CA 94105
Telephone: (415) 973-6611
Facsimile: (415) 973-0516
E-Mail: sww9@pge.com

Attorneys for
PACIFIC GAS AND ELECTRIC COMPANY

January 8, 2014