BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Oversee the Resource Adequacy Program, Consider Program Refinements, and Establish Annual Local Procurement Obligations.	R.11-10-023 Filed October 20, 2011

POST-WORKSHOP COMMENTS OF IMERGY POWER SYSTEMS, INC., PRIMUS POWER, ZBB ENERGY CORPORATION, ENERVAULT CORPORATION AND UNIENERGY TECHNOLOGIES, LLC ON ENERGY DIVISION PROPOSALS

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BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Oversee the Resource Adequacy Program, Consider Program Refinements, and Establish Annual Local Procurement Obligations.	R.11-10-023 Filed September 22, 2011

POST-WORKSHOP COMMENTS OF IMERGY POWER SYSTEMS, INC., PRIMUS POWER, ZBB ENERGY CORPORATION, ENERVAULT CORPORATION AND UNIENERGY TECHNOLOGIES, LLC ON ENERGY DIVISION PROPOSALS

Imergy Power Systems, Inc. ("Imergy"), Primus Power ("Primus"), ZBB Energy Corporation ("ZBB"), EnerVault Corporation ("EnerVault") and UniEnergy Technologies, LLC ("UET" and, together with Imergy, Primus, ZBB and EnerVault, the "Joint LDES Companies") hereby submit these comments on the Staff Proposal Outline on Qualifying Capacity and Effective Flexible Capacity Calculation Methodologies for Energy Storage and Supply-Side Demand Response Resources, dated January 16, 2014 ("Staff ES Proposal Outline") and the related workshop held in this proceeding on January 27, 2014 pursuant to Administrative Law Judge Gamson's February 4, 2014 email Ruling.

I. INTRODUCTION

As described in its motion for party status, filed concurrently with these comments and jointly with the other Joint LDES Companies (the "Joint LDES Companies Motion for Party Status"), Imergy is a California-based innovator of cost-effective energy storage products. Imergy's Energy Storage Platform product is a proprietary, scalable, low-cost, redox flow battery, combined with power electronics and controls and mounted in self-contained transportable

containers, ranging from 2.5 kW up to 250kW. Due to its modular construction and ability to scale, the Energy Storage Platform is easily capable of achieving a three hour discharge duration standard for an energy storage device to meet the requirements of providing Effective Flexible Capacity ("EFC").

Primus is a leader in low-cost, grid-scale energy storage solutions with a scalable, distributed, multi-hour flow battery system that economically serves multiple storage applications. With 15 patented innovations in chemistry, cell design and system engineering, Primus' EnergyPod® products offer exceptional power density, reliability and portability at industry-low prices.

ZBB designs, develops, and manufactures advanced energy storage, power electronic systems, and engineered custom and semi-custom products targeted at the growing global need for distributed renewable energy, energy efficiency, power quality, and grid modernization. ZBB has deployed systems up to 2MWh and has multiple grid connected systems in California. ZBB is a strong believer that the long duration needs of the market, as outlined by the Energy Division staff analysis, will require discharge times of 3 hours or longer.

EnerVault is an innovative manufacturer of megwatthour energy storage systems that are inherently safe, reliable and cost-effective for long duration, grid-scale applications. Headquartered in the Silicon Valley, EnerVault brings innovative Redox Flow Battery technology to solve grid reliability challenges and expand grid operational flexibility. EnerVault understands the importance of Resource Adequacy ("RA") within a well-balanced and secure electrical grid. EnerVault believes long duration, grid-scale energy storage is an essential part of a robust and resilient RA strategy meeting California's unique needs. As a California manufacturer, EnerVault is committed to efficiency and surety within the state's energy market.

UET produces and delivers large-scale energy storage systems for utility and grid, micro-grid, commercial and industrial, and other applications of value. UET's core technology is an advanced vanadium flow battery. The Uni.System™ is safe, operationally flexible, reliable, long-life, and cost-effective. UET has a 67,000 sqft engineering and manufacturing facility scaling up to produce 100MW annually, a sales force based in California, and ongoing energy storage project efforts in California. UET believes it is very important that the (RA) needs of California, including for EFC, be met as much as possible by renewables supported by energy storage resources which are capital-efficient and sized to meet the market's RA, including EFC, needs.

II. A THREE HOUR DISCHARGE PERIOD IS THE MOST APPROPRIATE COUNTING METRIC FOR DETERMINING EFC AT THIS TIME.

In its February 7, 2014 Draft Final Proposal on Flexible Resource Adequacy Criteria and Must-Offer Obligation ("FRAC-MOO Proposal"), the CAISO found that:

> [A]t this time, it is prudent to account for full flexible capacity storage resources based on the three hour discharge. Some will assert that this is a conservative approach. The ISO agrees. However, at this time, as we continue to learn more about the capabilities, potential, and operational characteristics of energy storage resources, it is reasonable to take a somewhat conservative approach. [1]

The Joint LDES Companies agree with each of these contentions. The Joint LDES Companies believe that, to the extent the three hour period is a conservative metric, that is entirely appropriate given: (1) the relative novelty of large-scale energy storage solutions being integrated into the California electric grid; (2) the on-going ramp up to California's 33% renewable portfolio standard, much of which will be met with intermittent wind and solar generation resources, the operating characteristics of which will take time for the CAISO and other market participants to determine and optimize; and (3) a "margin of error" for unforeseen events such as on-going and future

[1] Flexible Resource Adequacy Criteria and Must-Offer Obligation, Market and Infrastructure Policy Draft Final Proposal, February 7, 2014, at 38, *available at*: https://www.caiso.com/Documents/DraftFinalProposal-FlexibleResourceAdequacyCriteriaMustOfferObligation.pdf.

statewide droughts and fires (impacting hydroelectric production, transmission assets, etc.) and other extreme weather incidents, the decommissioning of the San Onofre Nuclear Generating Station, and so on.

The Joint LDES Companies further note that Energy Division staff have reduced the four hour discharge period initially recommended in the Staff ES Proposal Outline of January 16th to three hours (the same period recommended by CAISO), in the February 10, 2014 Staff Proposal on the Implementation of the Flexible Capacity Procurement Framework ("Staff Flexible Capacity Proposal").[2] While the Joint LDES Companies reserve the right to comment further on the Staff Flexible Capacity Proposal, they wish to clearly state their support for this specific aspect of the Staff Flexible Capacity Proposal, believing it reflects both the current state of large-scale energy storage technology and an appropriate compromise between the CAISO and Energy Division staff on this issue.

The Joint LDES Companies believe that the three hour metrics are in alignment with the expected operation of the California energy market. Specifically, the CAISO has studied how load is expected to ramp on an hour-to-hour basis starting in 2015, and the expected early evening (in the three hour window approximately 17:00 to 20:00) ramp is about 10,000 MW in 2015 (and will be almost 20,000 MW by 2020).[3] It is this ramping window where grid-connected energy storage can provide the most value to the CAISO and to all California energy consumers (and ratepayers), and it is currently those technologies capable of discharging for the entire three hour period that

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[2] Staff Flexible Capacity Proposal at 6 ("Specific counting conventions apply to determine the Effective Flexible Capacity ("EFC") of resources relative to a resource's Net Qualifying Capacity ("NQC"). The EFC reflects the flexibility of a resource that can be counted towards an LSE's flexible RA obligations. A resource must have a qualifying capacity ("QC") in order to have an EFC; therefore, all flexible resources must qualify as RA resources. In order to qualify for flexible procurement, a resource must be able to ramp and sustain energy output for a minimum of three hours." (emphasis added)).

[3] *See* Presentation of Mark Rothleder, Vice President of Market Quality and Renewable Integration, CAISO, on Long Term Resource Adequacy Summit, February 26, 2013, at 3, *available at* http://www.caiso.com/Documents/Presentation-Mark_Rothleder_CaliforniaISO.pdf.

will offer the greatest value.

Adopting a discharge period shorter than three hours for purposes of determining EFC is thus not supported either by those charged with determining and analyzing the needs of the California energy services market as a whole (specifically, CAISO and Energy Division staff), nor by the predicted operation of the near-term California energy services market. Adopting a shorter discharge period for current procurement purposes could lead to the need to acquire multiple, overlapping resources capable of meeting discharge needs only in the aggregate. Such procurement is inefficient from both a capital deployment and an operational performance perspective.

Finally, the Joint LDES Companies note that adopting a three hour duration discharge metric today does not preclude the Commission from adopting a shorter period in the future, after actual results of the operational characteristics of grid-connected energy storage resources are available. Indeed, the Joint LDES Companies look forward to discussing such actual results after the CAISO, the Commission, and all interested parties have that information in front of them.

III. CONCLUSION

The Joint LDES Companies appreciate the opportunity to comment on the Staff ES Proposal Outline and look forward to providing further input to the Commission in this proceeding. For the reasons set forth herein, the three hour duration discharge period should be adopted for all determinations of EFC of grid-connected energy storage solutions for RA purposes.

Respectfullysubmitted,

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