Rulemaking:	12-03-014
Witness:	Bill Powers
Exhibit No.:	

Order Instituting Rulemaking to Integrate and Refine Procurement Policies and Consider Long-Term Procurement Plans.	Rulemaking 12-03-014 (DMG) (Filed March 22, 2012)

ERRATA TO PREPARED OPENING TESTIMONY OF BILL POWERS ON BEHALF OF SIERRA CLUB CALIFORNIA

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF CALIFORNIA

October 4, 2013

applied through the LA Basin using preferred resources and energy storage. I also agree with CAISO's recommendation that the best way to consider the "appropriate resource 'mix'" to meet local reliability needs is to include consideration of transmission solutions. CAISO rightly explains that "[s]uch a mix can include additional preferred resources and other alternatives to conventional resources, depending on location and effectiveness."[83]

Can the new storage requirement in the SCE territory eliminate the 500 MW need identified by SCE?
Yes. SCE's portion of the energy storage procurement target is 580 MW by 2020.

What effect does the storage decision have in the SDG&E territory?
SDG&E will add 165 MW by 2020.

Is energy storage less costly than new gas-fired generation?
Yes. ~~The Commission~~ A study from the energy storage proceeding estimates the 2020 capital cost of 50 MW of battery storage with 2 hours of storage capacity at $1,056/kW, and with 3 hours of storage capacity at $1,406/kW.[84] ~~The Commission~~ This study estimates the 2020 capital cost of LMS100 units at $1,535kW.[85]

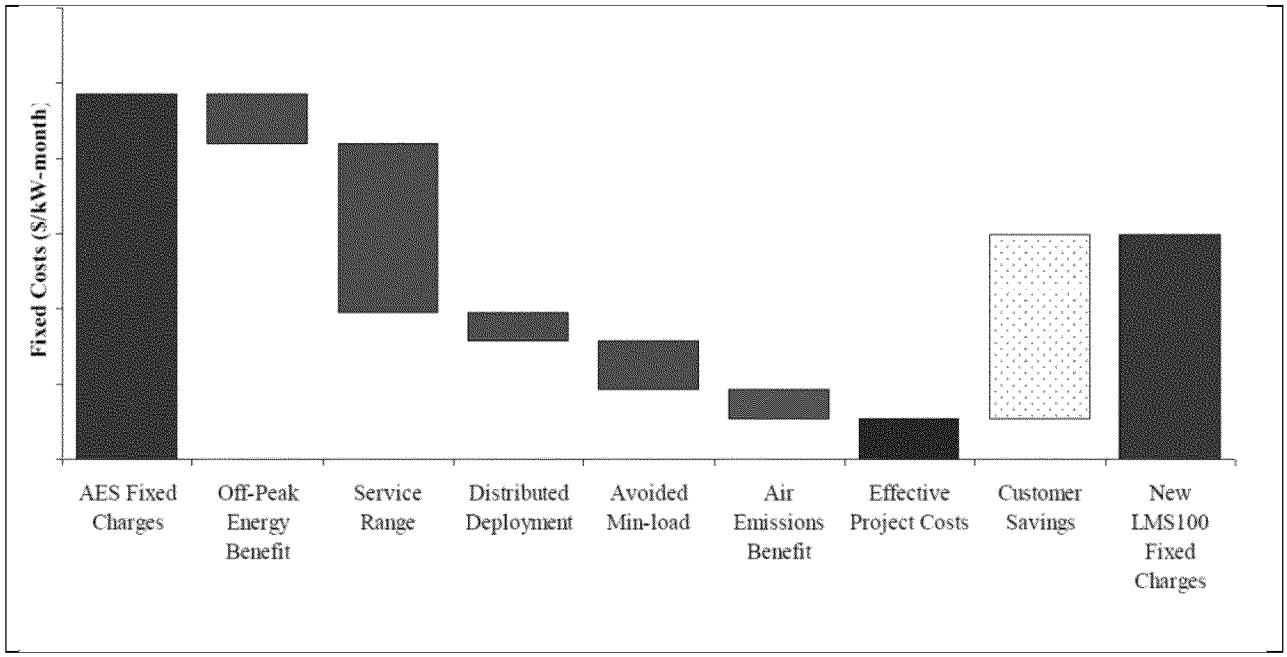
In contrast, SCE estimates a capital cost for a 10 MW battery facility of $1,983/kW with 4 hours of storage capacity. SCE assumes battery replacement occurs every 10 years.[86] A 4-hour capacity is excessive for local capacity purposes. For example, CAISO wholesale day-ahead demand response products must be able to respond to an event of up to 2 hours duration.[87] There is a substantial difference in the capital cost of 2- and 4-hours of battery storage.

Should SCE be given contingent generation contracts?
No. Contingent gas-fired generation contracts are used if it is likely that preferred resources cannot provide sufficient local capacity in a timely fashion and at reasonable cost. However, ~~the Commission's own~~ an analysis of battery storage in the energy storage proceeding demonstrates it will be cost competitive with gas-fired generation in 2020.[88] Battery storage has numerous characteristics that make it superior in meeting reliability needs, both from a cost and a

[82] SCE, Preferred Resource Pilot Targeted Scope, PowerPoint, September 26, 2013, p. 2, attached as "Sierra Club Exhibit 12"
[83] CAISO Testimony, p. 31, lines 4-5, 6-7.
[84] CPUC. CPUC Storage OIR Cost Effectiveness Modeling Input Template - Storage Plant Assumptions, line 83.
[85] CPUC, CPUC Storage OIR Cost Effectiveness Modeling Input Template - Conventional Plant Assumptions, LMS100 SAC - Total Overnight CAPEX, line 83.
[86] SCE. DATA REQUEST SET CEJA_DRA_Sierra Club-SCE-001, Response to Question 10 ("Sierra Club Exhibit 13") (Aug. 30, 2013).
[87] North American Energy Standards Board. Demand Response in Wholesale Electricity Markets: California Independent System Operator (CAISO) Demand Response Opportunities (Jun. 18, 2007), p. 2. Retrieved from http://www.naesb.org/pdf2/dsmee061807w3.pdf.
[88] CPUC, CPUC Storage OIR Cost Effectiveness Modeling Input Template - Conventional Plant Assumptions, LMS100 SAC - Total Overnight CAPEX, line 83 ("Sierra Club Exhibit 14"); CPUC. CPUC Storage OIR Cost Effectiveness Modeling Input Template - Storage Plant Assumptions, line 83 ("Sierra Club Exhibit 15")

performance perspective, when compared with gas turbines. These attributes are shown in the 2012 utility-scale battery storage-to-LMS100 cost comparison in Figure 5.

Figure 5. Cost- and Attribute Benefits of Utility-Scale Battery Storage versus LMS100 Gas Turbine[89]



Will air permitting in LA Basin affect new generation?
It will not if the new generation consists of non-gas preferred resources and energy storage.

VII. CONCLUSIONS

It is it reasonable to assume that SCE and SDG&E would experience their respective 1-in-10 year critical contingency events on the same day at the same time?
No.

Should SCE be authorized 500 MW of new procurement? Please explain.
No. It is unreasonable to assume any more than an N-1 contingency event occurring in SCE territory simultaneously with SDG&E experiencing its critical contingency. There is no guidance in either the CAISO standards or NERC standards that address the very remote possibility of simultaneous critical contingency events occurring in adjacent utility service territories.

[89] Kathpal, Praveen. (AES Energy Storage). Energy Storage for Flexible Peaking Capacity (Jun. 2012), p. 11. Retrieved from http://docketpublic.energy.ca.gov/PublicDocuments/Regulatory/11-AFC-1%20Pio%20Pico/2012/July/TN%2066154%2007-09-12%20Exhibit%20303%20-%20AES%20Energy%20Storage%20PowerPoint%20-%20June%202012%20Energy%20Storage%20for%20Flexible%20Peaking%20Capacity.pdf.

The modeling in Track 4 is premised on an erroneous identification of the SDG&E contingency as N-1-1. SCE states that the SDG&E N-1-1 contingency would send large power flows though the SCE system and down to San Diego, and therefore necessitates a joint contingency modeling approach. The simultaneous loss of the SDG&E's Southwest Powerlink and Sunrise Powerlink is a Category D "act of god" event under current WECC criteria. Neither SCE nor SDG&E should be authorized to build any new generation or transmission to counter an extremely unlikely Category D event. Neither CAISO nor NERC standards require or even suggest that Category D events would be addressed with generation or transmission solutions.

If either the N-1 NERC standard is applied to SDG&E, or the G-1, N-1 CAISO standard is applied, there would be no power flow surge through the SCE system and no technical justification for the SCE LA Basin and SDG&E to be modeled as if they were one combined load pocket.

Should SDG&E be authorized 500 MW of new procurement? Please explain.
No. The appropriate contingency for SDG&E is the NERC N-1 contingency. CAISO has made no cost-benefit showing that reliability is improved by applying the G-1, N-1 reliability standard. However, applying the G-1, N-1 standard and correctly classifying the G-1 unit in San Diego in 2022 as the steam turbine generator at the Otay Mesa combined cycle plant would add 1,424 MW of existing generation as LCR area capacity. If N-1 is applied, 1,684 MW of existing generation would be added as LCR area capacity. There is no need for any new SDG&E procurement, or the modeled 300 MW Pio Pico project, if all existing LCR area generation currently excluded from the SDG&E LCR area capacity ledger is included.

VIII. QUALIFICATIONS

What are your qualifications?
I began my career converting Navy and Marine Corps shore installation power plants from oil-firing to domestic waste, including woodwaste, municipal solid waste, and coal, in response to concerns over the availability of imported oil following the Arab oil embargo. I am a registered professional mechanical engineer in California with over 25 years of experience in the energy and environmental fields. I have permitted five 50 MW peaking turbine installations in California, as well as numerous gas turbine, microturbine, and engine cogeneration plants around the state. I organized conferences on permitting gas turbine power plants (2001) and dry cooling systems for power plants (2002) as chair of the San Diego Chapter of the Air & Waste Management Association.

I am also the author of the March 2012 *Bay Area Smart Energy 2020* strategic energy plan. This plan uses the zero net energy building targets in the California *Energy Efficiency Strategic Plan* as a framework to achieve a 60 percent reduction in GHG emissions from Bay Area electricity usage by 2020. I authored the October 2007 strategic energy plan for the San Diego region titled

"San Diego Smart Energy 2020." The plan uses the state's Energy Action Plan as the framework for accelerated introduction of local renewable and cogeneration distributed resources to reduce greenhouse gas emissions from power generation in the San Diego region by 50 percent by 2020. I am the author of several articles in Natural Gas & Electricity Journal on the use of large-scale distributed solar photovoltaics (PV) in urban areas as a cost-effective substitute for new gas turbine peaking capacity. I currently serve on the San Diego Environmental and Economic Sustainability Task Force. The mission of the task force is to produce a Climate Mitigation and Adaptation Plan for San Diego. I have a B.S. in mechanical engineering from Duke University and an M.P.H. in environmental sciences from the University of North Carolina – Chapel Hill. My resume is attached as Exhibit 16 to this testimony.

Dated: September 30, 2013 Respectfully Submitted,

_____/s/_____
Bill Powers