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BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Application of Southern California Edison Company (U 338-E) for Approval of the Results of Its 2013 Local Capacity Requirements Request for Offers for the Western Los Angeles Basin.	Application 14-11-012 (Filed November 21, 2014)

REPLY BRIEF OF POWERS ENGINEERING

Bill Powers, P.E.
Powers Engineering
4452 Park Boulevard, Suite 209
San Diego, California 92116
Telephone: 619-295-2072
Facsimile: 619-295-2073
Email: bpowers@powersengineering.com

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I. Introduction

SCE's Opening Brief highlights the merits of its application, minimizes critiques of the application raised by various parties, including Office of Ratepayer Advocates (ORA), Sierra Club, EnerNOC, Los Cerritos Wetlands Land Trust, and Powers Engineering, and ignores changed circumstances that reduce the LCR need to zero and eliminate the need for gas-fired generation ("GFG") procurement. Moreover, SCE's application violates Governor Brown's Executive Order B-30-15 and the requirements of California's Loading Order. The SCE application should be denied in its entirety.

If however the Commission concludes that there is a residual LCR need when changed circumstances are considered, the new Request for Offers ("RFO") issued by SCE should be limited to preferred resources and energy storage ("ES"). SCE has demonstrated in the least cost/best fit modeling conducted to support its application that in-front-of-meter ("IFOM") ES resources are least cost/best fit compared to low usage combustion turbines ("CT"). The high GHG emissions and indirect water use impacts of high usage combined cycle gas turbines ("CCGT") are incompatible with California law and undermine the state's efforts to reduce the carbon footprint of electric power generation. As a result, a new SCE LCR RFO, if it is deemed necessary by the Commission, should be limited to preferred resources and ES only.

II. SCE/CAISO Rely on NERC Transmission Planning Standards When It Is Expedient To Do So and Disregard Them When It Is Not

SCE and CAISO reference unmodified NERC reliability standards when it is convenient to undercut preferred resources, as when it imposes a 20-minute DR response time requirement, and opposes unmodified NERC reliability standards when it is inconvenient, as in the case of the authorization to use load shedding to address an N-1-1 event, because ignoring the NERC standard that allows load shedding would reduce LCR need and defeat SCE's application.

A. The Ex Post Facto Imposition of a 20-Minute DR Response Time Is Unreasonable

The California Independent System Operator ("CAISO") states in its Opening Brief that it relies on North American Electric Reliability Corporation ("NERC") requirements as the basis for the 20-minute demand response ("DR") time limit that SCE was imposed on DR offers after those offers had been already been received by SCE.[1] But, the NERC requirement referenced by CAISO - " *NERC standards call for the system to be repositioned within 30 minutes of the initial event"* - is generic in nature and not a requirement imposed by NERC on DR resources. CAISO and SCE's unreasonable imposition of a 20-minute DR response time, ostensibly to meet this NERC standard, had the concrete effect of eliminating conventional DR from SCE's application.

The fundamental purpose of DR is to reduce load on the grid at times of peak demand. DR is scheduled in advance specifically to address grid congestion on high load days. Thus, it is difficult to imagine a scenario where all available DR would not be scheduled for deployment 24-hours in advance of a forecast 1-in-10 year peak demand event. At a minimum DR resources would be dispatched one hour in advance to address unanticipated developments happening in real time that create a significant divergence from the 24-hour demand forecast. DR resources would not be held in reserve in case an N-1-1 contingency were to occur in the midst of the 1-in-10 year demand event. SCE and

[1] CAISO Opening Brief, p. 5.

CAISO identify no instance in which DR has not been available in practice. Rather, they summarily mention a generic NERC 30-minute system repositioning timeline to justify their wholesale disregard of DR from any further consideration.

SCE's treatment of DR in its application violates section 454.5 of the Pub. Util. Code.[2] According to 454.5(b)(9)(C), an electric utility "…shall *first* meet its unmet resource needs through all available energy efficiency and demand reduction resources that are cost effective, reliable and feasible." (emphasis added). SCE's application — with a minimal quantities of energy efficiency and no contracting of conventional (non-fossil) demand reduction resources in the West LA Basin area — violates this statutory mandate. As ORA points-out in its Opening Brief,[3] the Commission has confirmed that the burden is on the utility for all aspects of its application:

> As the Applicant, SCE must meet the burden of proving that it is entitled to the relief it is seeking in this proceeding. *SCE has the burden of affirmatively establishing the reasonableness of all aspects of its application.* Intervenors do not have the burden of proving the unreasonableness of SCE's showing.

The burden of proof of the reasonableness of imposing an ex post facto 20-minute response time requirement on DR resources rests on SCE. Neither SCE nor CAISO have made any case, much less a compelling one, that there would be significant amounts of DR remaining to dispatch 20 minutes into an N-1-1 contingency occurring during a 1-in-10 year demand event.

The only apparent purpose of the imposition of a NERC's generic standard which ~~S assert~~ compels a 20-minute response time on DR bids, after these bids had been received by SCE, was to assure that the conventional (non-fossil fuel based) DR bids would be non-compliant with an unanticipated requirement. But neither the facts submitted by SCE nor typical DR dispatch practices support SCE's disregard of DR resources.

[2] All subsequent references in this document to California Statutes are to the Public Utilities Code.
[3] ORA Opening Brief, p. 4.

B. Attempts to Undermine Commission Authorization of Load Shedding to Meet LCR Need in D.14-03-004 Are Unreasonable

SCE and CAISO rely on NERC requirements when convenient and undercut them when it is not. The Track 4 decision identifies the critical LCR contingency for SCE's LA Basin as the N-1-1 sequential loss of the 500 kV Southwest Powerlink and 500 kV Sunrise Powerlink in SDG&E territory.[4] The Track 4 decision classified this N-1-1 event as a NERC Category C contingency, and states that: "*NERC reliability standard TPL-003 permits load shedding in response to Category C contingencies*."[5] On the basis of this NERC reliability standard, the Commission authorized up to 588 MW of load shedding in the LA Basin and SDG&E territories to address LCR need:[6]

> Conclusion of Law 12: It is reasonable to subtract 588 MW from the ISO's forecasted LCR need to account for resources that will not be procured at this time to fully avoid the possibility of load-shedding in San Diego as a result of the identified N-1-1 contingency.

The NERC grid reliability standard is N-1 with no load shedding.[7] CAISO standards are additional to NERC reliability standards and do not substitute for them, as SCE witness Chinn testified.[8] It is up to the Commission to decide whether the additional CAISO standards represent an appropriate balance between just and reasonable rates and grid reliability.[9] CAISO used the substantially more conservative reliability standard of N-1-1 with no load shedding in modeling conducted for Track 1 and Track 4.[10] The Commission did not agree with CAISO on the lack of load shedding to meet this very

[4] D.14-03-004, p. 37.
[5] Id., p. 36, footnote 52.
[6] Id., p. 136, Conclusion of Law 12.
[7] Transcript (TR) p. 268:24-28, p. 269:1-7.
[8] TR p. 269:28, p. 270:1-6.
[9] Powers Opening Brief, p. 4.
[10] The Commission deferred to CAISO on whether the N-1-1 was applicable at all for transmission planning purposes. See D.14-03-004, p. 126, Finding of Fact 32. "Issues regarding whether an ISO-determined Category C contingency (N-1-1) should instead be functionally a Category D contingency under WECC reliability standards are more within the expertise of the ISO than the Commission."

conservative reliability standard. The Commission authorized 588 MW of load shedding in D.14-03-004 to reduce the LCR need.[11]

Mr. Chinn testified that CAISO had recently updated its transmission planning standards to prohibit load shedding in urban areas in response to Category C contingencies.[12] This testimony was provided as a counter to Powers Engineering opening testimony that the Commission should correct its inadvertent discounting of the 588 MW the load shedding it authorized in D.14-03-004. The correction would reduce the LCR need by several 100s of MW in the West LA Basin.[13] In contrast, SCE advises the Commission to defer to CAISO's new additional standard which constitutes an ex post facto nullification of the Track 4 load shedding authorization the Commission decided in D.14-03-004. The Commission should reject this attempt by SCE and CAISO to add yet another layer of conservatism, unsupported by any demonstration that grid reliability would improve as a result, to SCE's transmission planning standard and override the Commission's Track 4 load shedding authorization.

Mr. Chinn confirmed that the "stakeholder procedure" used by CAISO in setting the new additional standard is not evidentiary.[14] Mr. Chinn is SCE's transmission planning expert witness. Yet Mr. Chinn could not name any stakeholders in the CAISO transmission planning standard process, and was not one of the stakeholders himself.[15] Thus, the Commission should reject the CAISO's attempt to shoehorn in a new, more conservative standard that has not been the subject of any public or evidentiary process. The CAISO's revised information constitutes an end-run around the Commission's determinations on this exact point in D.14-03-004.

This approach to the application of NERC reliability standards by SCE and CAISO is not reasonable. In addition, even if the treatment of NERC reliability standards by SCE and CAISO was not unreasonable, the reliability mission of CAISO differs from

[11] D.14-03-004, p. 136, Conclusion of Law 12.
[12] SCE-06, p. 21:15-19.
[13] Powers Opening Brief, pp. 10-11. The 433 MW SCE West LA Basin load shed authorization was inadvertently discounted by 81 percent. 433 MW x 0.81 = 350.7 MW. Therefore about 350 MW of load shedding in SCE's West LA Basin was inadvertently discounted by the Commission in D.14-03-004.
[14] TR p.272:10-24.
[15] Id.

that of the Commission. It is the Commission's role to balance reliability with other considerations, including reasonable rates and environmental protection,[16] and not allow CAISO's ever more stringent interpretations of NERC reliability standards to trump California law.

The Commission has clearly defined that the burden of proof rests with the utility:[17]

> Of course the burden of proof is on the utility applicant to establish the reasonableness of energy expenses sought to be recovered. We expect a substantial affirmative showing by each utility with percipient witnesses in support of all elements of its application.

The Commission should reject the DR contracts in the application and order SCE to conduct a new RFO if it determines that there is any residual LCR need to be met in 2022.

III. SCE Has Failed to Contract for the Minimum Amount of Preferred Resources and Energy Storage

SCE indicates in its Opening Brief ~~for~~ procuring "an extraordinary amount" of preferred resources and ES.[18] In fact, SCE failed to procure the minimum amount of preferred resources and ES that the Commission directed it to procure in D.13-02-015 and D.14-03-004. SCE also went to considerable lengths to avoid awarding contracts to conventional DR providers. SCE used arbitrary criteria to limit IFOM ES capacity to 100 MW.

D.13-10-040 obligates SCE to have 580 MW of ES under contract by 2020.[19] SCE proposes to contract for only 264 MW of ES resources in its application.[20]

The SCE application should be denied by the Commission. The Commission should direct SCE to conduct a new RFO if it determines that any need remains following

[16] D.13-02-015, pp. 126-127, Conclusion of Law 1.
[17] ORA Opening Brief, p. 3.
[18] SCE Opening Brief, p. 2.
[19] D.13-10-040, Table 2, p. 15.
[20] SCE-01, Table I-1, p. 3.

an assessment of the impact of changed circumstances on the D.13-02-015 and D.14-03-004 need authorizations.

IV. This Contract for CCGTs that Will Emit More Than Three Times the GHGs Emitted by the OTC Units the CCGTs Will Replace and Constitues an Unreasonable Use of Ratepayer Money

Two-thirds of the capacity contracted in the application, 1,284 MW of 1,883 MW, will be high capacity factor CCGTs. Nowhere in D.13-02-015 or D.14-03-004 does the Commission set aside gas-fired generation ("GFG") capacity specifically for CCGTs. The preferential treatment in the application to high capacity CCGTs fundamentally conflicts with D.13-02-015, Conclusion of Law 2:

> Consistent with § 454.5(b)(9)(C), which states that utilities must first meet their "unmet resource needs through all available energy efficiency and demand reduction resources that are cost-effective, reliable and feasible," and the Commission's Loading Order established in the Energy Action Plan, utility LCR procurement must take into account the availability of preferred resources before procuring non-preferred resources.

SCE states in its Opening Brief that it is replacing 4,141 MW of aging, inefficient GFG in the Western LA Basin with 1,382 MW of clean, efficient GFG and approximately 500 MW of preferred resources and energy storage.[21] The implication of this statement is that the clean and efficient GFG will produce less GHG. This is not the case. The California Energy Commission ("CEC") reference cited by SCE includes the capacity factors for the 4,090 MW of LA Basin once-through cooled ("OTC") capacity, not 4,141 MW, that SCE indicates will be replaced.

The composite capacity factor of these OTC units in 2014 was less than 4 percent.[22,23] In contrast, SCE assumes that the 644 MW Huntington Beach CCTG will have a 75 percent capacity factor and the 640 MW Alamitos CCGT a 53 percent capacity

[21] SCE Opening Brief, p. 2.
[22] Id., p. 2, footnote 3 (CEC report, *Tracking Progress, Once-Through Cooling Phase-Out*, February 17, 2015).
[23] See **Attachment A** to Powers Engineering Reply Brief.

factor.[24] The two CCTGs will produce more than five times the amount of electricity collectively produced by the 4,090 MW of OTC units in 2014.[25] The two CCGTs will produce more than three times the amount of GHGs emitted by these OTC units in 2014, an increase of more than 2 million tons per year of CO_2 emissions.[26]

The least cost/best fit modeling conducted by SCE to support the application demonstrates that preferred resources, specifically IFOM ES, are lower cost than GFG. The exception is high usage CCGTs. However, the CCGTs only achieve least cost by operating 4,600 to 6,600 hours per year and generating at least 2 million tons per year more GHG than the OTC units they will replace~~d~~. The natural gas serving these high usage CCGT units will come in part from wells stimulated by hydraulic fracking ("fracking"). Fracking is a controversial practice that uses large amounts of water at a time when California and the Western U.S. are experiencing severe drought conditions.

On April 29, 2015 Governor Edmund G. Brown issued Executive Order B-30-15. It committed California to reducing greenhouse gas emissions to 1990 levels by 2020 and to further reduce the state's emission levels to 80 percent below 1990 levels by 2050. One key provision of the Executive Order is Ordering Paragraph 2 which states: "All state agencies with jurisdiction over sources of greenhouse gas emissions shall implement measures pursuant to statutory authority, to achieve reductions of greenhouse gas emissions to meet 2020 and 2050 greenhouse gas emissions targets." In addition, Ordering Paragraph 6 charges state agencies with "…taking climate change into account in their planning and investment decisions and employ full life-cycle accounting to evaluate and compare infrastructure investments and alternatives."

It is unreasonable for the Commission to approve these CCGT contracts. If approved, they will result in a substantial increase in GHG emissions in the LA Basin compared to current LA Basin OTC plant GHG emission levels. The CCGT contracts should be denied by the Commission due to the fundamental conflict created by the

[24] SCE-01, p. 58:14-17.
[25] Powers Engineering Reply Brief, Attachment A, Table A-1.
[26] Id., Table A-2.

environmental impacts of high usage CCGTs with the requirements of § 454.5(b)(9)(C). These environmental impacts include: 1) a major direct increase in GHG emissions from SCE Western LA Basin power plants and, 2) an increase in indirect water impacts from hydraulic fracturing to produce the much greater quantities of natural gas that will be consumed in the high usage CCGTs than is currently consumed in the low usage OTC plants. The high usage CCGT contracts violate Governor Brown's Executive Order B-30-15 and the requirements of California's Loading Order.

V. SCE Is Mistaken When It States No Party Had Broad-Based Objections to the Contracts that SCE Selected

SCE is incorrect when it states that no party had broad based objections to the contracts SCE selected through the LCR RFO.[27] Powers Engineering stated in opening testimony that "*The set-aside of up to 1,200 MW of need authorization specifically for gas-fired generation in the February 13, 2013 2012 LTPP Track 1 final decision, D.13-02-015, is unreasonable in the context of changed circumstances since the decision was issued that have eliminated the need for this gas-fired generation authorization*."[28] The changed circumstances include: 1) continued actual peak demand decline in SCE and the LA Basin, 2) approval by CAISO of the Mesa Loop-In Project with a 2020 operational date, which will reduce LA Basin LCR need by 1,200 MW, 3) an increase in SCE's net-metered solar target from approximately 850 MW under the California Solar Initiative (2007) to 2,240 MW under AB 327 passed into law in October 2013, 4) an increase in SCE's energy storage target from 50 MW in D.13-02-015 to 580 MW by 2020 in D.13-10-040.[29]

EnerNOC also objected to SCE's flawed DR solicitation process.[30] Further, ORA and Sierra Club expressed objections to the NRG DR contract awards and the 100 MW

[27] SCE Opening Brief, p. 2.
[28] Powers Engineering Opening Testimony, p. 1:26-28 and p. 2:1-2.
[29] Id., p. 2:5-12.
[30] EnerNOC Opening Brief, pp. 8-39.

IFOM ES cap imposed by SCE.[31,32] Powers Engineering objected to the award of 50 MW of energy storage capacity to a firm, Advanced Microgrid Solutions, with no energy storage experience, no specific battery technology, no employees, and no collateral.[33] Collectively the objections of parties to the proceeding covered most of the capacity contracted by SCE in the 2013 LCR RFO. There is no merit to SCE's statement that there were no broad-based objections to the contracts that SCE selected.

VI. SCE, by Opting Not to Fill Mandatory 2020 ES Targets Now in Favor of GFG Procurement, Will Cause SCE Ratepayers to Pay Twice for the Same LCR Capacity When the Mandatory ES Capacity Is Built

SCE's claim in its opening brief that "*the 100 MW of IFOM ES selected in SCE's LCR RFO represents a massive and unprecedented increase in IFOM ES in the state of California*"[34] sidesteps that fact that SCE is obligated by D.13-10-040 to have 310 MW of IFOM ES under contract, and 580 MW of all types of ES under contract, by 2020. Displacing this obligatory ES procurement with GFG contracts now will make the additional ES that will be contracted for by 2020 redundant for meeting the LCR need SCE's application is intended to address.

SCE cites to language in the Track 1 decision to assert that energy storage procurement is an "*experiment*."[35] This is exactly why changing circumstances need to be assessed in this application. Since the Track 1 decision was issued, the Commission has established an ES procurement target of 580 MW by 2020 for SCE.[36] What the Track 1 decision characterized as an experiment is now a minimum obligation of 580 MW of ES by 2020. SCE presented no evidence on the state of utility-scale ES to support a

[31] ORA Opening Brief, p. 5, p. 18.
[32] Sierra Club Opening Brief, p. 4, p. 10.
[33] Powers Engineering Opening Brief, p. 18.
[34] SCE Opening Brief, p. 6.
[35] Id., p. 7.
[36] D.13-10-040, Table 2, p. 15.

contention that it is experimental technology and only admitted it owned and operated mature utility-scale ES on Catalina Island under cross-examination.[37]

SCE's statement that "*the Commission did not intend that SCE be required to sign contracts from energy storage suppliers at all costs*"[38] is ironic in light of SCE's least cost/best fit modeling showing over 900 MW IFOM ES was least cost compared to CTs. Only high capacity factor CCGTs, with attendant high GHG emissions, were lower cost than IFOM ES. This is a case of SCE signing GFG contracts at all costs at the expense of least cost/best fit IFOM ES contracts.

VII. Conclusion

There is no LCR need to be met in SCE's Western LA Basin when changed circumstances are properly accounted for. The SCE application should be denied in its entirety. If however the Commission concludes that there is a residual LCR need when changed circumstances are considered, the new RFO issued by SCE should be limited to preferred resources and ES. SCE has demonstrated in least cost/best fit modeling conducted to support its application that IFOM ES resources are least cost/best fit compared to low usage CTs. The high GHG emissions and indirect water use impacts of high usage CCGTs are incompatible with California law and undermine the state's efforts to reduce the carbon footprint of electric power generation. As a result, a new SCE LCR RFO, if it is deemed necessary by the Commission, should be limited to preferred resources and ES only.

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[37] Powers Opening Brief, p. 17.
[38] SCE Opening Brief, p. 7.

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Respectfully submitted,

/s/

Bill Powers, P.E.
Powers Engineering
4452 Park Boulevard, Suite 209
San Diego, CA 92116
Telephone: (619) 295-2072
Facsimile: (619) 295-2073
bpowers@powersengineering.com

Table A-1. 2014 weighted-average capacity factor of OTC units in SCE West LA Basin

Unit	capacity, MW	2014 capacity factor (thru 8/14)	contribution to composite weighed-average CF of OTC units
El Segundo 4	335	0.034	0.0028
Huntington Beach 1	215	0.160	0.0084
Huntington Beach 2	215	0.126	0.0066
Redondo Beach 5	179	0.018	0.0008
Redondo Beach 6	175	0.005	0.0002
Redondo Beach 7	505	0.000	0.0000
Redondo Beach 8	496	0.006	0.0007
Alamitos 1	175	0.005	0.0002
Alamitos 2	175	0.041	0.0018
Alamitos 3	326	0.083	0.0066
Alamitos 4	324	0.092	0.0073
Alamitos 5	485	0.000	0.0000
Alamitos 6	485	0.020	0.0024
	4090		0.0378

reference, 2014 OTC unit capacity factors (thru August 2014): CEC, *Tracking Progress - Once-Through Cooling Phase-Out* , February 17, 2015, Table 1, p. 3.

Total OTC unit MWh-yr, 2014: 1,354,024 [4,090 MW x 8,760 hr/yr x 0.0378]

Proposed CCGTs, MWh-yr: 7,194,400 Huntington Beach CCGT: 644 MW x 6,600 hr/yr = 4,250,400 MWh-yr
Alamitos CCGT: 640 MW x 4,600 hr/yr = 2,944,000 MWh-yr

Table A-2. Projected 2014 CO2 emissions from OTC units in SCE West LA Basin

Unit	MW	2014 CF (thru 8/14)	heat rate (MMBtu/MWh)	2014 CO2 emissions (tpy)
El Segundo 4	335	0.034	11.140	65,451
Huntington Beach 1	215	0.160	10.530	186,851
Huntington Beach 2	215	0.126	10.690	149,381
Redondo Beach 5	179	0.018	17.690	29,401
Redondo Beach 6	175	0.005	22.280	10,056
Redondo Beach 7	505	0.000	10.220	-
Redondo Beach 8	496	0.006	10.910	16,748
Alamitos 1	175	0.005	17.290	7,804
Alamitos 2	175	0.041	14.560	53,888
Alamitos 3	326	0.083	10.760	150,182
Alamitos 4	324	0.092	11.130	171,134
Alamitos 5	485	0.000	10.270	-
Alamitos 6	485	0.020	10.700	53,538
	4090			894,435

CF = capacity factor

CO2 emission factor, natural gas combustion: 117.77 lb/MMBtu

reference: CEC, *Guidelines for Certificaction of CHP Systems Pursuant to the Waste Heat and Carbon Emissions Reduciton Act, Public Utilities Code Section 2840 Et Seq* ., Feb. 2015, p. A-9.

Total OTC CO2 tpy, 2014: 894,435

reference - OTC unit heat rate: CEC,*The Role of Aging and Once-Through-Cooled Power Plants in California—An Update* , February, 2010, Appendix B: Historical Operations Data.

CO2 Emission Rate from Proposed CCGTs at Huntington Beach and Alamitos:

Proposed CCGTs CO2 tpy: 3,053,708

Assumed CCGT heat rate, Btu/kWh: 7,204

Assumed CCGT CO2 emission rate, lb/MWh: 848

reference - CCGT heat rate: CEC, *Thermal Efficiency of Gas-Fired Generation in California: 2014 Update* , September, 2014, Table 2, p. 3.