BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Integrate and Refine Procurement Policies and Consider Long-Term Procurement Plans	Rulemaking 12-03-014

OPENING BRIEF OF CITY OF REDONDO BEACH ON TRACK 4

MICHAEL W. WEBB
CITY ATTORNEY
CITY OF REDONDO BEACH

LISA BOND
TOUSSAINT S. BAILEY
ANDREW BRADY
RICHARDS WATSON GERSHON
355 South Grand Avenue, 40th Floor
Los Angeles, CA 90071
Telephone: (213) 353-8484
Facsimile: (213) 626-0078
E-Mail:
lbond@rwglaw.com
tbailey@rwglaw.com
abrady@rwglaw.com

Attorneys for:
CITY OF REDONDO BEACH

Dated: November 25, 2013

TABLE OF CONTENTS

TABLE OF AUTHORITIES

Page

Statutes

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Integrate and Refine Procurement Policies and Consider Long-Term Procurement Plans	Rulemaking 12-03-014

OPENING BRIEF OF CITY OF REDONDO BEACH ON TRACK 4

I. INTRODUCTION

Pursuant to Rule 13.11 of the California Public Utilities Commission's (Commission or CPUC) Rules of Practice and Procedure, the City of Redondo Beach (City) hereby submits its Opening Brief on Track 4 of the 2012 Long Term Procurement Plan (LTPP) proceeding. The purpose of Track 4 of the 2012 LTPP proceeding is to consider the local reliability impacts of a potential long-term outage at the San Onofre Nuclear Power Station (SONGS) generators.

The City's proposal optimally addresses long-term (2022) local reliability needs in the Los Angeles *and* the San Diego sub-areas in the absence of the SONGS units. The City proposes that a combination of 1000 megawatts (MW) of Gas-Fired Generation (GFG) plus about 2000 MW of additional preferred resources in the Western LA basin sub-area (LA),[1] along with 1100 MW of Gas-Fired Generation (GFG) in the San Diego area as proposed by CAISO, can meet the total capacity needs of the area in the year 2022. The 800 MW of preferred resources (including storage), 1000 MW of conventional resources already authorized for SCE, and 343 MW of conventional resources authorized for SDG&E in Track 1 are included in the above total. The City believes that the authorization of about 1200 MW of additional preferred resources (including storage) is a prudent Track 4 authorization for Southern California Edison Company (SCE) in LA at this time.

[1] The 2000 MW is in addition to 169 MW that was modeled by the California Independent System Operator (CAISO) in its 2012-2013 no-SONGS base case. Therefore the total preferred resource need would be 2169 MW.

The City's solution is practical since the City's resource availability assumptions are not too extreme in either direction. The forecasted amounts of preferred resources are based on projections by state agencies, including CAISO. The City's solution combines reasonable GFG additions with a realistic amount of dependable capacity from preferred resources such as Energy Efficiency (EE), Demand Response (DR), Combined Heat and Power (CHP), Distributed Generation (DG), and Storage to meet reliability needs.

The City's proposal addresses the market power issue that is imbedded in less optimal proposals that rely solely on GFG purchases tied to a handful of specific brownfield coastal locations in the Western LA basin LCR sub-area. The City's solution relies on a broader scope of locations throughout the Western LA basin sub-area, thus providing greater limitations on the ability of local owners of convention generation to exercise market power.

Furthermore, the City's recommended solution was derived through a series of technical power flow analyses similar to the analyses performed by CAISO and the utilities.[2] The City's solution also meets the area need as determined by CAISO's stringent load forecast and reliability requirements.[3] As shown in Table 1 below, a comparison of projected need for additional dependable capacity (accounting for forecast loads, existing resources, retirements, generation under construction within the LCR study areas and the maximum level of reliable imports into the LCR study areas) by the City and CAISO[4] indicate that the two parties actually arrive at a similar level of dependable capacity need for the Western LA basin-sub area.

Table 1. Track Need By LCR Area

Party	**Track 4 Need by LCR Area** (Need is incremental to any authorization already provided for in the Track 1 decision)	
	Western LA basin sub-area	San Diego area
City	1140 MW[5]	753 MW
CAISO (1.b)	1222 MW	1177 MW

[2] SCE and CAISO's criticisms of the City's analysis lack merit, as explained in more detail in Section III of this brief.

[3] 1-in 10 load forecast plus 2.5% to provide reactive power margin and determination of need under N-1-1 contingency conditions without relying on controlled load drop.

[4] *See* R.12-03-014 (Comparison of all Track 4 Need Recommendations by All Parties to the Proceeding).

[5] 1140 MW (2940-1800) is in addition to the 169 MW already modeled in the CAISO base case.

Neither CAISO nor SCE, however, have specifically addressed the mitigation that would be necessary for the N-1-1 outage of the 230 kV Serrano-Lewis #1 line followed by the outage of the 230 kV Serrano-Villa Park #2 line. Instead, they have only addressed mitigation for the larger "SONGS area." The City understands that all reliability standard violations need to be addressed. In making decisions for the larger "SONGS area," the Commission should ensure it also addresses needs within the local sub-areas, including the Western LA basin sub-area. The City's proposal is the only proposed solution that addresses both issues.

The City's proposal is the only one on the table that fully provides for future reliability needs in light of the SONGS closure by offering a measured and sensible program of preferred resource development while, at the same time, limiting the ability of local owners of conventional generation to exercise market power. The City's proposal does so while fully supporting California's energy policy goals and the loading order. By utilizing reasonable projections for preferred resources rather than conventional ones, the City's proposal best facilitates the achievement of SB 1078's requirement to increase procurement from eligible renewable resources to 33% by the year 2020.

II. THE COMMISSION SHOULD ADOPT THE CITY'S PROPOSAL

A. The City's Proposal Calls for a Well-Balanced Solution that Meets Reliability Needs While Addressing All of the Commission's Goals and Requirements

Regarding the issues raised in this Track 4 proceeding, the City proposes that a combination of 1000 MW of GFG, plus about 2000 MW of additional preferred resources in LA,[6] along with 1100 MW of GFG in the San Diego area as proposed by CAISO, can meet the dependable capacity needs of the area in year 2022. The different components of the preferred resources are shown below in Table 2. Assuming the availability of 800 MW of preferred resources (including storage) and 1000 MW and 343 MW of conventional resources already authorized for SCE and SDG&E in Track 1, the City believes that the authorization of about 1200 MW additional preferred resources (including storage) is a prudent Track 4 authorization for SCE in LA.

[6] The 2000 MW is in addition to 169 MW that was modeled by the CAISO in its 2012-2013 no-SONGS base case. Therefore the total preferred resource need would be 2169 MW.

The City did not perform separate power flow analysis to optimize the combination of preferred and conventional (GFG) resources in the San Diego area to meet the identified LCR. However, the City believes that it would be prudent to set aside a portion of the LCR in the San Diego area to be filled by preferred resources.[7] For this reason, the City's recommends that the Commission postpone any decision to authorize the amount and types of resource additions for SDG&E. Before issuing a decision regarding additional procurement authority for SDG&E, additional analysis needs to be performed to find the most economically and environmentally sound solution. The City can offer assistance in performing such analysis.

Table 2. The City's Proposed Dependable Capacity Need for Year 2022

	Preferred Resources in LA[8] (MW)	Conventional Resources in LA (MW)	Conventional Resources in the San Diego area (MW)
Calculated Total need (A)	2000[9]	940	1100
Track 1 authorization (B)	800	1000	343
Calculated Track 4 need (A-B)	1200	-60	757
Recommended Authorization for Track 4	1200	0	0

The City proposes that about 2000 MW of preferred resources in the Western LA basin sub-area be developed gradually over the next ten years. As shown in Table 3 below, this amount is made up of uncommitted EE, CHP, DG, dispatchable DR, and storage. Although storage was not separately modeled, it is assumed that dependable storage capacity would be distributed and available at the time of the area peak. Dependable MW capacity provided by storage could then replace any of the other preferred resources shown in the table below in a 1 to 1 basis. Similarly, since the preferred resources are all distributed and are modeled mainly in proportion to the bus loads, what matters from an analytic standpoint is the total dependable

[7] According to SCE's original Track 4 testimony (Table III-4) the ratio of San Diego area load to Western LA basin sub-area loads is about 40% (5483/13609 = 40%). Therefore it is reasonable to assume about 800 MW (40% x 2000 = 800 MW) of dependable preferred resources can be developed in San Diego area assuming that the potential for development of preferred resources in San Diego and LA are similar.
[8] The preferred resources include storage. The storage capacity can be counted as dependable capacity since it is assumed that the energy stored is available to the system during the peak hours when the need for the local capacity has been identified.
[9] The 2000 MW excludes the 169 MW already assumed in the model.

capacity provided by the preferred resources, and not the specific megawatt amount for each type of preferred resource shown.

Table 3. The City's Proposed Annual Dependable Capacity Additions for the 2013-2022 Period

Year:	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Uncommitted EE within W LA (NQC):	75	151	226	301	377	452	527	603	678[10]	753
Uncommitted CHP Within W LA (NQC):	20	40	60	80	100	120	140	160	180[11]	200
Dist Generation within W LA (NQC):	97	193	290	386	483	579	676	772	869[12]	966
Dispatchable Demand Response (NQC):	25	50	75	100	125	150	175	200[13]	225	250
Total of Preferred Resources	217	434	651	867	1085	1301	1518	1535	1952	2169*[14]
1st block of AES's proposed Huntington Beach CC plant[15]:	0	0	0	0	0	0	470	470	470	470
2nd block of AES's proposed Huntington Beach CC plant[16]:	0	0	0	0	0	0	0	470	470	470
Total of Conventional Recourse	0	0	0	0	0	0	470	940	940	940
Total of Preferred + Conventional Resources	217	434	651	867	1085	1301	1988	2475	2892	3109

[10] D.13-02-015, page 21. The power flow analysis performed confirmed that not all 1247 MW is needed.
[11] *See* footnote 10.
[12] D.13-02-015, page 19, table 4 (CAISO Environmentally Constrained case).
[13] D.13-02-015, page 56.
[14] 169 MW of this amount was already assumed to be in the model by CAISO.
[15] The addition of AES's proposed repower is based on the schedule AES submitted to the California Energy Commission.
[16] *See* footnote 15.

The City's analysis shows that if an average of about 200 to 220 MW[17] of preferred resources (*i.e.*, EE, DR, CHP, DG and storage) are developed each year in LA starting in 2013, along with the development of 940 MW of conventional resources at the existing Huntington Beach generation site and 1100 MW in San Diego at the locations recommended by CAISO, the dependable capacity need in LA, the San Diego area and the combined "SONGS area" can be met. This need reflects the retirement of existing Once-Through-Cooling (OTC) generation and the completion of generation currently under construction.

The City recommends that the Commission develop a process to check and measure the development of preferred resources over the next 3-5 years in LA. If it is determined that development has fallen short of the 200 or 220 MW annual average goal the Commission can then determine if a back-stop measure -- such as a controlled load-drop (SPS) should be put in place and the timing of such implementation. If a reliability concern is identified it will likely not occur until after the assumed retirement of over 3800 MW[18] of existing OTC generation at the Alamitos, Huntington Beach and Redondo Beach generating stations. The back-stop load drop measure would only be needed until the preferred resource goal is reached. The Commission should examine the cause of slower than expected development of preferred resources should it occur, and adopt appropriate incentives to encourage the development of more preferred resources, or take other steps as necessary.

The conservative assumptions used by CAISO in its SONGS area LCR analysis have been pointed out by the City and other parties, including SCE. Because CAISO has used conservative assumptions, the need to implement a back-stop SPS for controlled load drop is very unlikely.[19] If the risk is low and the associated costs modest, controlled load-drop may be the sensible action to avoid the possibility of over commitment and also wide-spread uncontrolled electric outages. If the risk is high and the associated costs large, other mitigation options—including additional generation procurement—may make sense. The key point is that decision-makers need these risks and costs quantified in order to decide what is best for

---

[17] The 200 MW average excluding the 169 MW of DG already assumed in CAISO 2012-2013 transmission plan. The 220 MW includes CAISO 169 MW DG (2169 MW/10 = 217 MW year) the average annual would be about 217 MW/year.

[18] Alamitos of 2010 MW + Huntington Beach 452 MW + Redondo Beach 1356 MW = 3818 MW.

[19] The planned and controlled interruption of supply to customers (load shedding) can be achieved with the use of a SPS.

consumers. Risk quantification provides essential information to guide decision-makers in the appropriate choice of mitigation options.

More specifically, about 1000 MW of new resources could be located at the existing Huntington Beach generating station. According to CAISO's Local Capacity Technical (LCT) study,[20] generation at the Huntington Beach location is more effective than other OTC locations—*e.g.*, Alamitos and Redondo Beach—in mitigating the contingency condition that sets the LCR for the area. For example, according to CAISO's 2018 LCT analysis, the effectiveness factors of the Huntington Beach, Alamitos and Redondo Beach units are 24%, 21%, and 14%, respectively for the Western LA basin sub-area LCR analysis. This means the generation at Huntington Beach and Alamitos is far more effective in relieving the reliability concerns in the Western LA basin sub-area than generation at Redondo Beach. This makes sense since generation at Huntington Beach and Alamitos are closer (physically and electrically) to the part of the system that would be stressed by the worst outages considered.

The "SONGS area" analyses performed by both the City and SCE also confirm that, following the overlapping outage of the Southwest Powerlink and Sunrise Powerlink, the stressed area in LA is located in the southern portion of the SCE area (around the Serrano, Santiago and San Onofre substations). Generation at the location of the Huntington Beach and Alamitos generating stations is physically and electrically closer to these stressed areas than generation in Redondo Beach, and is therefore more effective at relieving the stress.

Similar to LA, instead of authorizing only conventional resource additions to meet the San Diego area LCRs, the Commission should authorize procurement of a combination of preferred and conventional resources. Like the City's recommendation for LA, a process could be used to measure progress in developing preferred resources in the San Diego area. If 800 MW of preferred resources can be developed in the San Diego area by year 2022, then an average of 80 MW per year development would be required beginning in year 2013. Therefore, together, the LA and San Diego area preferred resource additions would total about 300 MW per year. The Commission could set this level of annual additions as a goal. In combination with the 1000 MW and 343 MW of Track 1 conventional resource procurement authorization in the LA and San Diego areas respectively, the above preferred resources could meet the SONGS area

[20] *See* CAISO LCT 2018 Draft Report, March 2013.

requirement[21] while meeting both the environmental and reliability goals. And, as noted above, preferred resource additions help to minimize the ability of generation developers controlling OTC sites to exercise market power. Preferred resource additions also reduce stranded investment risks.

B. The City's Analysis

The City used the same inputs and methodology used by CAISO.[22] These assumptions include the same loads, resources, and power flow base cases. The City's analytic methodology is the same methodology used by CAISO and the Investor Owned Utilities (IOUs) in annual transmission planning and in the Track 4 proceeding. Accordingly, SCE and CAISO's criticisms of the City's methods lack merit, as explained in more detail in Section III of this brief below. Indeed, the only real difference between the City's solutions and the solutions offered by CAISO, SCE and SDG&E are the types of resources proposed to be added. For example, in comparison to SCE's request for authorization to procure 500 MW of conventional resources. AES goes even farther in the wrong direction, proposing 1000 MW of conventional resources. The City's alternative recommendation is for the authorization of 1200 MW of preferred resources.

In its earlier analysis,[23] the City used a Loads & Resource (L&R) table methodology[24] to show how the dependable capacity needs of the area can be met under different OTC retirement scenarios. In these analyses, the City used the same load forecast and resource (retirement and additions) as were used by CAISO in its studies for LA.

To more accurately examine and determine how best to meet the dependable capacity needs in light of the possible retirement of SONGS, the City employed power flow analysis. Power flow analysis is used to confirm that a particular locational mix of dependable capacity

---

[21] A simple power flow analysis can verify that the combination of 800 MW of preferred resources and 343 of Track 1 resource assumptions can meet the need compared to the 1100 MW of conventional resources determined by CAISO to be adequate for San Diego.

[22] The technical studies were conducted using General Electric's Power System Load Flow (GE PSLF) program.

[23] October 2010 report performed for the California Coastal Conservancy entitled "Analysis of the Need for Generating Capacity at the Redondo Beach Generation Station", referenced in the City's opening testimony.

[24] L&R table also include local capacity need determined from the CAISO LCT analysis for the area under the study (West LA).

will satisfy applicable reliability requirements. This is the same approach employed by SDG&E, SCE and CAISO in their respective Track 4 analyses. The City ran a number of power flow cases examining LCRs under several scenarios including with-and without-SONGS units to support its recommendations.[25]

The components of the City's power flow analysis are described below:

Power Flow base cases:

Relevant CAISO power flow cases used by CAISO for its 2012 -2013 transmission plan (which includes no-SONGS studies) and for its Track 4 studies. These power flow cases were obtained from CAISO's secure website.[26]

Loads:

The City used the same load forecast used by CAISO in its March 20, 2013 Board-approved 2012 -2013 transmission plan. This load forecast is about 2.5% higher than the CEC forecast to assure that the required 2.5% reactive margin under the N-1-1 contingency condition is available. SCE's Track 4 analyses, on the other hand, did not increase the CEC's one-in-ten year peak loads by 2.5%.[27]

Resources Added:

The resources modeled in the case, except for the preferred resources, all match what is modeled by CAISO in its 2012-2013 transmission plan for the no-SONGS studies and for CAISO's Track 4 analysis. The study involved changing the 2460 MW of generation modeled by CAISO at the location of the existing Alamitos and Huntington Beach generating stations by: (i) turning off 2000 MW of existing generation at the Alamitos generating station; (ii) increasing the amount of generation at the Huntington Beach generating station from 460 MW to 940 MW; (iii) adding 2000 MW of preferred resources at various locations in LA (for total of about 3000 MW); and (iv) as adding 1100 MW of generation in the northern and southern parts of the San Diego LCR area as recommended by CAISO. It is necessary to add generation in the San Diego area to make sure the case can be solved regardless of which area, or contingency condition, is

[25] Analysis of Local Capacity Requirements in the Western LA Basin Sub Area, June 2013.
[26] The 2022 base cases with and without SONGS units were examined as well as the 2022 Track 4 base cases.
[27] SCE August 26 Testimony, page 27.

being analyzed. The case, with the above described generation additions, was examined under the various scenarios and contingencies described below to assure system reliability is maintained under the most severe N-1-1 contingency condition.

Location of Preferred Resources:

The load reductions (EE and DR) assumed by the City were spread proportionately across the Western LA Basin sub-area. The 797 MW of DG were spread proportionately across the Western LA Basin sub-area. Additional CHP was applied proportionately to load at substations shown below:

LITEHIPE
ELLIS
LCIENEGA
EL NIDO
LA FRESA
HINSON

The following table compares the City's and CAISO's preferred resource assumptions:

Table 4. Non-Conventional (Preferred) Resource Additions in LA

Resource Type and Location	City's Dependable Capacity in W LA (MW)	CAISO's Dependable Capacity (MW)
Uncommitted Energy Efficiency	753	787
EE in SCE (outside LA)	0	232
EE in SD	0	196
Combined Heat & Power	200	0
Distributed Generation In LA	966	247
Distributed Generation in SD	0	210
Dispatchable Demand Reduction	250	197.95[28]
Total	2169	1869.95

[28] According to the CAISO opening testimony Table 4 two 8.4 MW = 16.8 MW DR is located in San Diego.

Power Flow Cases Studied:

Several dozen power flow runs were performed to confirm the assumed mix of conventional and preferred resources satisfied identified LCRs. The power flow runs also examined different contingencies under different scenarios (*e.g.*, removing all generation at the existing Redondo Beach facility and removing the Redondo Beach substation and removing the transmission lines connecting the Redondo Beach substation to the remainder of the grid) to make sure that the proposed solution is stable and does not result in unacceptable thermal overloads or voltage deviations. The set of contingencies examined were selected based on engineering judgment and knowledge of the weak/stressed areas of the transmission system under study.

Selected Contingencies:

As described above, the City assumed that the N-1-1 contingencies identified in CAISO's studies are the worst-case contingencies and verified CAISO's determination by performing dozens of power flow runs. The City however, did not perform an independent analysis to examine if any other combination of the contingencies, such as a G-1/N-1, could be worse; nor did the City perform any stability analysis.[29] The City used engineering judgment to limit the number of possible contingency conditions that needed to be studied. According to the City's analysis, which is also verified by SCE's testimony,[30] the stressed part of the transmission system for both the LA and the SONGS area are the same and are located in the Serrano/Santiago substation areas in the Western LA basin sub-area. Specifically the City has determined that its proposed solution works under any N-1-1 contingency condition without the need to rely on controlled load-drop. Although the City has verified this conclusion through power flow analysis, the conclusion can also be reached logically.

As shown in CAISO's transmission plan studies for 2018 and 2022, the stressed area under the worst outages of two 230 kV lines in the area (the outage of the 230 kV Serrano-Lewis #1 line followed by the outage of the 230 kV Serrano-Villa Park #2 line) without SONGS is the

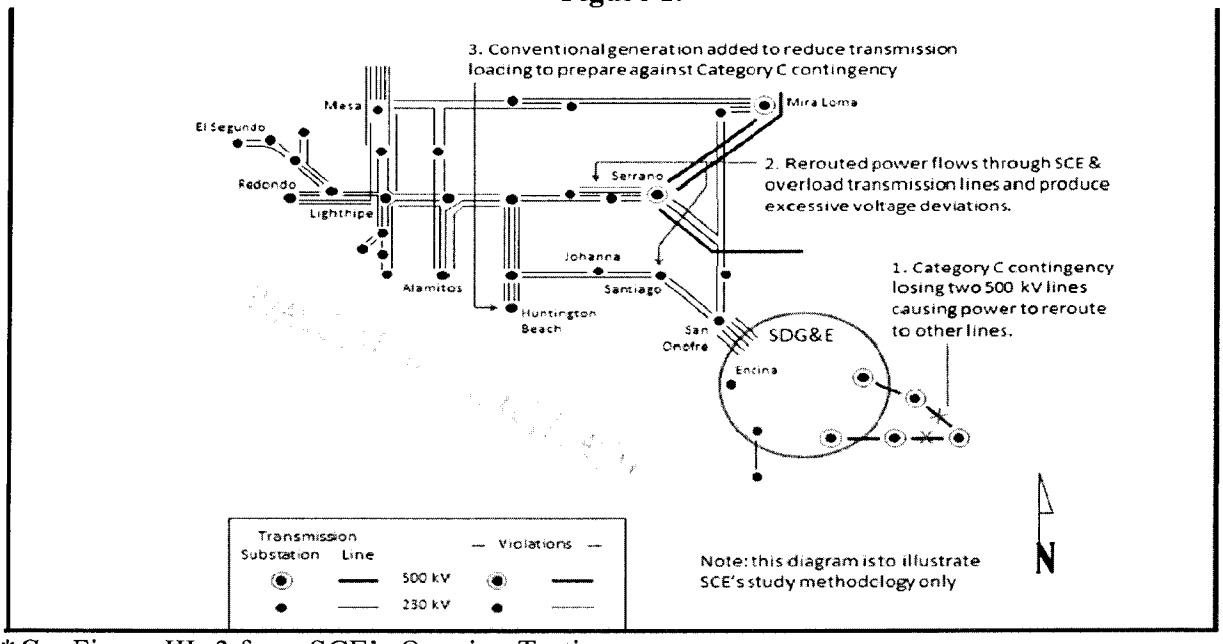
[29] The City assumed that N-1-1 is the worst contingency for the area based on the numerous previous analysis performed by the CAISO resulting in the same conclusion.
[30] SCE Opening Testimony, pages 24-25.

Serrano/Santiago substation area.[31] The outage of two 500 kV lines east of the San Diego LCR area (the outage of 500 kV Suncrest–Ocotillo line followed by the outage of the 500 kV ECO – Miguel line) is identified by both the CASIO and SCE as a critical contingency for the "SONGS area." This contingency also stresses the Serrano/Santiago substation area in LA.

As shown in Figure 1 below, and as SCE has confirmed in their opening testimony, the outage of the two 500 kV lines connecting the San Diego area to the Imperial Valley and Arizona, causes power that was flowing into San Diego through these two lines to be rerouted through SCE's system causing stress around Serrano and Santiago areas. This is the same stressed area studied by the City under the two 230 kV outages in Orange County. This rerouting causes voltage drop due to the longer distance the power has to travel to get to the San Diego load center. The addition of generation in the Southern part of SCE's distribution service area and in the Western LA basin sub-area, as well as in the northern and southern parts of SDG&E's distribution service area, would help this situation by unloading the flows around the Serrano and Santiago substations. It would provide more direct flows into the San Diego area. This is the same conclusion that CAISO has reached with its recommended solutions for the 2012-2013 transmission plan under the no-SONGS scenario. CAISO's 2012-2013 transmission plan results confirm the validity of the City's analysis.

[31] CAISO March 20, 2013 Board-Approved 2012-2013 Transmission Plan, table 3.5-8, at page 175 and table 3.5-12, at page 192.

Figure 1.*



**See* Figure III -3 from SCE's Opening Testimony.

Area Studied:

Although the City's report focused on how to best meet the need in LA, the study included a much wider area of California, and for that matter, the WECC. As all power flow engineers know, in order to solve a power flow case, all locational resource needs— including those in the LA and San Diego areas—have to be modeled accurately. Otherwise, the power flow solution under the specified set of contingencies could present thermal or voltage issues. In this regard the City's model is consistent with CAISO's, SDG&E's and SCE's models.

The City's solution is flexible since it allows for gradual and measured commitments to, and development of, new resources. These commitments can be adjusted up or down over time to meet changing reliability needs. Controlled load drop is recommended only as a backstop in the event that resources are not developed at the assumed rate. Controlled load drop prevents widespread cascading outages, thereby assuring that reliability will not be compromised. This flexibility is important because it limits the risk of stranded investment and allows time for the Commission to react to and realign IOU procurement authorizations with changes in loads and resources, in additional to allowing the Commission to respond to technological innovations and environmental concerns.

III. THE CITY'S RESPONSES TO COMMENTS AND TESTIMONY

A. The City's Response to SCE's Rebuttal Testimony

SCE's suggests that if, CAISO changes its existing transmission planning standards to eliminate the option of using controlled load-drop as mitigation for N-1-1 contingency events, a cost/benefit analysis should be conducted.[32] This is consistent with the City's view: Before any mitigation options are eliminated—including the option of relying on controlled-load drop, the relative costs and benefits need to be quantified.

In the instant proceeding, no party has provided any evidence as to what the costs and benefits of controlled load-drop actually are. The City is the only party that presented evidence of the probability of the N-1-1 contingency condition at issue in this proceeding. This probability is exceedingly low, so for controlled load drop to be ruled out as a backstop mitigation solution, the costs need to be very high.

Regarding the City's proposed use of load shedding, SCE stated that "the capacity provided by generation and transmission is more flexible than load shedding."[33] The City agrees with this observation. However, this does not mean that controlled load-drop should be ruled out as a mitigation option. Rather, as SCE has suggested elsewhere, the costs and benefits of all mitigation options need to be made before determining that controlled load-drop, on an expected basis, is less economical for consumers than new generation and/or transmission.

SCE also complains that "CAISO has yet to identify specific attributes that would apply to Preferred Resources whose purpose is meeting LCR needs."[34] The statement is in contrast to statements made by CAISO that it has identified such attributes. In any event, it should be noted that CAISO currently counts a wide-range of resources towards LCRs. These include non-dispatchable wind, solar, run-of-river hydro and Qualifying Facility generation. If these non-dispatchable resources already count toward LCRs, it would be a significant and unjustifiable change in policy to not count incremental Preferred Resources towards LCRs. Similarly, SCE's

---

[32] SCE Rebuttal Testimony, page 15 ("to the extent that specific general and/or localized criteria are adopted to avoid load shedding for Category C contingencies, the costs and benefits of such criteria should be comprehensively evaluated, and reasonable time lines for implementation of required system changes should be adopted.")
[33] *Id.*, at page 16.
[34] *Id.*, at page 26.

assertion Preferred Resources have been used in the past to meet specific compliance targets, they have not been used to meet LCR needs is simply incorrect.[35] To the contrary, there are numerous wind, solar, hydro and biogas resources in the San Diego area that count towards the San Diego area LCR.

On Page 35 of its, rebuttal testimony, SCE states that:

> "The idea of a single IPP providing the majority, if not all, of the required new GFG while serving as the backstop for the transmission and Preferred Resource strategies is very risky from a reliability standpoint as that IPP has no obligation to serve. In addition, the timing and likelihood of approvals from the CEC for the Huntington Beach Application for Certification (AFC), the Redondo Beach AFC, and the yet to be filed Alamitos AFC are uncertain."[36]

The City agrees with SCE that relying on AES to provide the majority, if not all, of the required GFG is risky and recommends that the Commission look to: (i) CAISO's prior reliance on Preferred Resources to meet LCRs; (ii) the fact that AES has ample options to develop new GFG at the Huntington Beach or Alamitos locations; and (iii) other options such authorizing purchase of preferred and distributed resources as recommended in the City's testimony.

Contrary to SCE's statements regarding Vote Solar's proposals,[37] the City believes that Vote Solar's suggestion is entirely appropriate for SCE's proposed Pilot. The need for voltage support in the SONGS area is a key element of establishing LCRs for the SONGS area. Smart inverters enable direct current power sources, such as rooftop solar PV and batteries, to supply and absorb reactive power. While a large portion of Preferred Resources are likely to be located at the distribution level, it is worth examining whether these voltage support attributes will have beneficial impacts at the transmission level.

SCE complains that Vote Solar's suggestions "are specific to solar technology and do not allow for the development of a...balanced portfolio of resources to meet LCR needs."[38] SCE

---

[35] *Id.*, at page 30.
[36] *Id.*, at page 35.
[37] *Id.*, at page 37 ("Vote Solar's suggestion that the Pilot be expanded to include testing of advanced inverters seems more appropriate for a targeted conventional pilot....the Pilot should not be burdened with pursuing research initiatives that do not meet the LCR needs in the targeted area.")
[38] *Id.*

does not explain why it is necessary or important to have a "balanced portfolio." If it turns out that Preferred Resources can dependently and cost-effectively satisfy LCRs, and if a large portion of these resources are solar, the City sees no obvious advantage to a "balanced portfolio."

Regarding the City's proposal, SCE repeatedly states incorrectly that the City's analysis narrowly focused on a single contingency identified by CAISO for the LA Basin.[39] As demonstrated above, however, the City's study included several dozens of different power flow analyses, involving different resource assumptions, different contingencies, and even different transmission configurations. The City examined many more contingencies besides the worst-case contingencies identified by SCE, CAISO and SDG&E. The City found the same contingencies identified by SCE, CAISO and SDG&E to be the most limiting contingency event for purposes of establishing local capacity needs. Moreover, SCE has not conducted studies to show that the contingency condition evaluated by the City of Redondo Beach is not the most severe contingency condition for the Western LA Basin LCR sub-area. SCE has no basis for alleging that the mitigation proposed by the City fails to mitigate other viable contingencies.

Additionally, based on an SCE response to a City data request, the City understands that SCE has not performed any analysis nor provided any evidence that shows the Redondo Beach generating station and 230 kV lines connecting the plant to the remainder of the transmission grid are needed to meet the Western LA basin sub-area LCRs, the "SONGS area" LCRs or the San Diego area LCR. So SCE failed to establish that it would be "wrong to conclude from this study that the Redondo Beach Generating Station and 230 kV lines connecting the plant to the transmission system are not needed to meet the LCR need in the LA Basin."[40]

Absolutely no evidence has been provided that there is a worse contingency for the Western LA basin sub-area. Neither SCE nor CAISO has provided any evidence to indicate that the N-1-1 outage of the outage of the 230 kV Serrano-Lewis #1 line followed by the outage of the 230 kV Serrano-Villa Park #2 line is not the limiting contingency event that establishes LCRs for the Western LA basin sub-area. All of CAISO's recent technical LCR studies conducted without SONGS—including the 2017 and 2018 LCT studies and the 2012-2013 CAISO Board-approved Transmission Plan—have found that the outage of the 230 kV Serrano-

[39] *Id.*, at pages 42-44.
[40] *Id.*, at page 42.

Lewis #1 line followed by the outage of the 230 kV Serrano-Villa Park #2 line is the most limiting contingency event for the Western LA basin sub-area. The City asserts that if a different contingency event were limiting, CAISO would already have made this information public.

SCE also disingenuously attacked the City's additional study, stating that "[e]ven with this additional study, Redondo Beach did not perform adequate analysis to support their conclusion. Their studies are dependent on a specific SDG&E dispatch."[41] Every power flow analysis, however, including each one discussed in this proceeding by SDG&E, SCE, CAISO and others, requires and therefore depends on a "specific SDG&E dispatch." SCE's statement is misleading and inconsistent with basic modeling requirements.

SCE also incorrectly states that the City "assume[s] that procurement of conventional GFG in the LA Basin will be at optimal locations. If these assumptions prove untrue, the need for the Redondo Beach site can change."[42] But the City's modeling of conventional generation in the location of the existing OTC (Huntington Beach) is consistent with the SCE's assumed generation modeled at Huntington Beach and Alamitos. [43] The City's analysis shows that the generation located at either Huntington Beach or Alamitos is more effective in relieving the overloads resulting from worst-case contingencies than generation modeled at the location of the existing Redondo Beach generating station. CAISO's base case also modeled the proposed generation additions at Huntington Beach and Alamitos, and not at Redondo Beach. The City's conclusion that the generation located at other OTC locations (Huntington Beach and Alamitos) is more effective than at the Redondo Beach is supported by both SCE's and CAISO's own assumptions and results.

Additionally, the need for additional dependable capacity in the San Diego is about 1100 MW. The City provided the correction for its initial typographical error stating the need was 900 MW, therefore SCE's complaints about the initial erroneous assertion lack merit.[44] The City's power flow analysis adopted CAISO's recommended locations for the 1100 MW of new generation; about 800 MW in the northern San Diego area and 300 MW in the southern San

---

[41] *Id.*, at page 43.
[42] *Id.*
[43] SCE Track 4 testimony table III-5 scenario 1.
[44] SCE Rebuttal Testimony, page 43.

Diego area. This locational information could easily be determined from the power flow base case that the City provided to SCE—SCE's complaints otherwise lack merit.

As stated above, the City has not optimized the location of its conventional and preferred resources. That is why the City's solution required about 3000 MW of resources in LA as opposed to CAISO's proposed 2460 MW. The City assumes that the 1000 MW of conventional resources authorized in Track 1 is likely to be located at either the Huntington Beach or Alamitos brownfield sites. As stated earlier, this assumption is consistent with SCE and CAISO's assumptions. If SCE's is concern is about having more generation location options, the City recommends developing more distributed generation since DG provides significant locational flexibility. SCE's observation and statement of fact support the need for a flexible solution, the same solution been offered by the City.

Finally, SCE complains that the "amount and location of Preferred Resources, the completion of transmission development, and the location and amount of GFG can alter whether new GFG is needed at the Redondo Beach site. It is premature to conclude based on Redondo Beach's study that the Redondo Beach location is not needed."[45] These same uncertainties, however, exist for the solutions presented by SCE, CAISO, and SDG&E. The mere existence of uncertainty, however, should not prevent parties from proposing better solutions for a given set assumptions. The very existence of these uncertainties is the reason the City is recommending that the Commission not commit to large generation or transmission infrastructure additions. Instead, the City recommends the Commission adopt a flexible and gradual process that allows realignment and adjustments in the intervening years before the actual need arises. SCE should not be able to use uncertainty to reject a sensible solution or justify actions that now are clearly unnecessary. The needs identified in this Track 4 proceeding are best met by the City's proposal, as it offers the most sensible approach to achieving the flexibility SCE's purports to be concerned about.

[45] *Id.*, at page 44

B. The City's Response to CAISO's Testimony

1. Response to Rebuttal Testimony of Neil Millar

CAISO's attempts to rebut the City's proposal lack merit. On page 4 of the rebuttal testimony of Neil Millar, he states that "...the ISO has published information that identifies the characteristics needed from preferred resources in order for those resources to meet local capacity needs....the ISO has developed a preliminary methodology to assess the necessary characteristics for preferred resources to address local capacity issues..."[46] This is a curious statement because, for years, CAISO has counted preferred resources towards local capacity needs. For example, in the San Diego LCR area, wind, biomass, biogas, and solar photovoltaic resources are counted towards San Diego area LCRs. These resources are not dispatchable and their output can vary dramatically depending on ambient conditions; characteristics that do not lend themselves to "operational requirements in transmission-constrained local areas."[47]

Mr. Millar goes on to state that "the ISO argues against accepting large amounts of load shedding as an acceptable long term transmission planning solution in highly urbanized areas of the ISO grid."[48] Yet, CAISO does not clearly define what it means by highly urbanized areas. Nor does CAISO explain what it means by "large." The City suspects that the implications for controlled load-drop are much different in downtown metropolitan areas than, for example, residential suburbs. The City notes that controlled load-drop can be targeted for circuits that do not have sensitive loads. CAISO, SDG&E and SCE have offered no quantitative evidence to support their respective determinations that controlled load-drop, of any magnitude, is an unacceptable mitigation option for a highly improbable N-1-1 contingency condition, particularly as an interim solution as proposed by the City.

The Commission could find that costs and possible consequences of any controlled load drop are unacceptable, but the Commission should make such findings based on concrete analytic evidence. That evidence is not available to the CPUC in this proceeding. The City notes that CAISO has acknowledged that it already "relies on occasion on smaller blocks of load

[46] Track 4 Rebuttal Testimony of Neil Millar on Behalf of CAISO, at page 4.
[47] *Id.*, at page 7.
[48] *Id.*, at page 8.

shedding, as well as larger blocks of load shedding on an interim basis..."[49] The City also believes it is noteworthy that the CAISO now intends to conduct an open stakeholder process to augment its planning standards in the first half of 2014. The Commission should not pre-judge the outcome of that stakeholder process by concluding, without evidence, that any amount of controlled load drop is an unacceptable backstop mitigation solution for highly improbable N-1-1 contingency events.

Mr. Millar's rebuttal testimony also states that:

> "The suggested approach of performing detailed cost benefit analysis in every case of considering reinforcement beyond the minimums established by NERC is not a practical consideration in all cases and not a practical consideration in this particular case....given the practical limitations associated with conducting a cost/benefit analysis for each Category C contingency, the ISO has therefore continued the historical practice of limiting the amount of load shed relied upon on a long term basis in densely populated areas and has employed cost/benefit analysis as a useful tool in cases where it is appropriate."[50]

In the City's view, cost/benefit analysis is always "appropriate" when the Commission is considering whether and how to commit consumer's money. As a public interest organization, CAISO should hold a similar view. The City does believe, however, that the amount of effort put into cost/benefit analysis should be consistent with the magnitude of the options under consideration. It would not make sense to spend hundreds of thousands of dollars analyzing options which could cost or save consumers only a few million dollars. Conversely, it would not make sense to bypass cost/benefit analysis for options which could cost or save consumers hundreds of millions of dollars. In the instant situation, controlled load-drop has the potential to save consumers hundreds of millions of dollars. A cost/benefit analysis which includes the option of controlled load-drop as a backstop measure should be performed for the N-1-1 mitigation solutions being considered in the instant proceeding.

Mr. Millar goes on to state that "[n]one of the parties submitting testimony have presented any compelling basis for the Commission to change its use of the ISO's LCR

---

[49] *Id.*
[50] *Id.*, at page 10.

methodology for determining local capacity needs for the LA Basin and the San Diego local areas..."[51] The City, however, never suggested that CAISO change its *methodology* for determining LCRs. The City understands that the CAISO is obligated by NERC reliability standards to test N-1, N-1-1 and G-1/N-1 contingency conditions and to identify mitigation solutions where reliability standard violations are found. However, the City does believe CAISO should consider a range of feasible wires and non-wires *solutions*, including increased levels of preferred resources and the possibility of controlled load-drop on an interim basis.

2. Response to Opening Testimony of Robert Sparks

Regarding the study work performed by the city, Mr. Sparks stated that "...applying probabilistic arguments to one possible transmission system outage system condition without considering all other possible outage conditions is a fundamentally flawed application of the probabilistic study technique."[52] The City suspects CAISO misunderstands the City's position on the use of probabilities in the instant proceeding. The City is not suggesting that, for purposes of this proceeding, CAISO should adopt the use of a probabilistic transmission planning criteria. Indeed, reliance on such criteria would appear to violate NERC's current reliability requirements, which are deterministically-based. Instead, the City is making the simple point that when application of the current deterministic reliability standards result in a violation, probability of occurrence is entirely relevant in selecting which mitigation solution is best for consumers. CAISO elsewhere agree with the City's point when it states that "[p]robabilistic techniques...have been utilized more frequently to assist in the selection of the optional alternative to address a reliability issue..."

Mr. Sparks also stated that:

> "The ISO provided the Commission with ample information about how engineers at the ISO develop mitigation solutions for the N-1-1 contingency and the circumstances under which load shedding is not a prudent planning option. The ISO's position is that load shedding in the densely populated San Diego area should not be used as a transmission planning tool for the N-1-1 NERC Category C contingency...This is due to the significant amount of load that would be subject to load shedding, the sensitivity of urban

[51] *Id.*, at page 12.
[52] Track 4 Testimony of Robert Sparks on Behalf of CAISO, at page 4.

loads to large blocks of shedding, the complexity of operating arrangements in the area..."[53]

The City agrees that the amount of load shedding is relevant, and that the implications of dropping sensitive loads need to be considered. Unfortunately, neither CAISO nor the utilities have provided testimony exploring how different levels of controlled load-drop could be used to mitigate identified reliability standard violations. Nor has any evidence been presented to show why sensitive loads could not be excluded from a controlled load-drop scheme. Finally, the City believes the parties to the proceeding are entitled to know how the "complexity of operating arrangements in the area" lead to CAISO's conclusion that controlled load-drop is unacceptable.

Mr. Sparks then references "the history of transmission line outages due to fires and equipment failures" but provides no data to indicate what this "history" is. CAISO states that the "outage risks...are high" but provides no quantitative measure of what it means by "high." CAISO states that "relying on load shedding as a primary mitigation measure is an indication that the system is being planned and operated at a very high stress level, and with very little margin for error." The City does not understand the implied correlation between controlled load-drop and "stress level," nor does CAISO explain what it means by a "stress level." Controlled load-drop is a mitigation option to avoid wide-spread cascading outages; rather than an indicator of "stress," controlled load-drop relieves "stress." CAISO suggests that "...additional load shedding...could lead to overly excessive amounts of load shedding." The CAISO provides no data to indicate what an "overly excessive" amount of controlled load-drop would be.

The City believes objective criteria need to be developed to give decision-makers the information necessary to decide the circumstances under which different mitigation options make the most sense for consumers. References to vague terms such as "high," "stress" and "overly excessive" are not helpful when deciding whether to commit consumers to hundreds of millions of dollars in costs.

3. The City's Response to Rebuttal Testimony of Robert Sparks

On page 2 of his rebuttal testimony, Mr. Sparks states that:

[53] *Id.*, at page 7.

> "...according to the May 21, 2013, Revised Scoping Ruling, the ISO was to determine the residual local capacity needs in the LA Basin and San Diego local areas (combined into a SONGS study area), using the assumptions approved in D.13-02-015 and D.13-03-029, assuming a SONGS outage for years 2018 and 2022 and SONGS online in 2022. The ISO's local capacity requirement (LCR) study methodology was thoroughly litigated in both proceedings and it was approved in both decisions. This study methodology includes the ISO's position that load shedding in the highly urbanized San Diego local capacity area is not appropriate to mitigate the N-1-1 contingency of overlapping outages of the SWPL and Sunrise Powerlink transmission lines."[54]

In his rebuttal testimony, Mr. Sparks advances a new and novel definition of "study methodology." He now claims that the CAISO's LCR "study methodology" includes the CAISO's "position" that controlled load-shed may not be relied on as mitigation for N-1-1 contingency events. He asserts that because the Commission approved the CAISO's LCR "study methodology" in D.13-02-015 and D.13-03-029, the Commission has implicitly approved the CAISO's position that controlled load-shed may not be relied on as mitigation for N-1-1 contingency events."[55]

The City believes the CAISO's LCR "study methodology" identifies the *amount* of dependable capacity within a local area that needs to be available to mitigate identified reliability standard violations. The choice of mitigation solution—new conventional generation, transmission upgrades, additional preferred resources, controlled load-drop—is a separate determination. So far as the City knows, the Commission has never specifically "approved" the CAISO's "position" that controlled load-drop may not be relied on as mitigation for N-1-1 contingency events.

Mr. Sparks also incorrectly stated that the City recommended that additional local capacity needs for the LA Basin/San Diego study area be based on an assumption that SDG&E will drop load as a permanent mitigation solution for the N-1-1 contingency.[56] CAISO misunderstands the City's recommendation. The City's solution meets the reliability need under

---

[54] Track 4 Rebuttal Testimony of Robert Sparks on Behalf of CAISO, at page 2.
[55] *Id.*, at page 3.
[56] *Id.*, at page 4.

the N-1-1 contingency condition without the use of controlled load-drop. In meeting this higher local requirement, the City has proposed the use of GFG and gradually developing preferred resources. If the development of the preferred resources turns out slower than anticipated, only then does the City recommend the use of controlled load-drop. Controlled load-drop would be an interim solution until the desired amount of generation is added, which is consistent with CAISO's own planning practice.

The City understands CAISO's obligations to carefully review the consequences of any proposed controlled load-drop SPS.[57] However, it is the City's position that, as a public interest entity, CAISO's obligations go well beyond evaluating the technical merits and physical consequences of a controlled load-drop SPS. CAISO should also evaluate the comparative economic impacts of a controlled load-drop SPS against other potential solutions for mitigating reliability standard violations arising from an N-1-1 contingency event. CAISO has presented no evidence in this proceeding that would allow the Commission to make an objective determination that the consumers would be better off, or worse off, relying on some amount of controlled load-drop as a stopgap measure.

While CAISO suggests an N-1-1 contingency event could occur "on the order of once in 13 years," it provides no indication of the expected duration of an overlapping outage, or how likely such a contingency event is to occur during a one-in-ten-year peak load weather condition -- the weather condition assumed for purposes of CAISO's LCR study methodology.[58] As the City has suggested in its testimony, the combination of the: (i) expected frequency of an overlapping N-1-1 contingency event; (ii) the expected duration of an overlapping N-1-1 contingency event; and (iii) expected hours that an overlapping N-1-1 contingency event would coincide with a one-in-ten-year peak load weather condition, results in an extraordinarily low likelihood of occurrence. Given this low likelihood of occurrence, CAISO and the Commission should consider whether the economic benefits of some amount of controlled load-drop as a stop gap relative to other solutions offsets the costs and inconvenience to whatever load may not be served.

---

[57] *Id.*, at page 5.
[58] *Id.*, at pages 5-6.

Mr. Sparks states that the "...Imperial Valley substation...is vulnerable to human coordination errors due to miscommunication and inconsistent practices for taking clearances and designing protection systems. This exposure is a potential contribution towards an increased risk of line outages and the N-1-1 outage in particular." Yet, CAISO does not indicate what the "increased risk of line outages" is in relation to so it is not possible to make an informed judgment as to whether this "increased risk" is material. Moreover, all substations that connect different Balancing Authorities are "vulnerable to human coordination errors." CAISO's apparent response to this concern is to commit consumers to hundreds of millions of dollars in infrastructure additions. The City suggests that a much more sensible and effective response would be to spend a fraction of this money on improving inter-Balancing Authority communications, clearance procedures and protection system design practices. CAISO wants to use a railroad spike when a finishing nail is actually needed.

Mr. Sparks goes on to state that, "[g]iven the selection of the Sunrise environmentally preferred route, which has a higher outage risk,...the risk profile impacts of outages interrupting supply from Imperial Valley have significantly increased in recent years."[59] It makes no sense to take actions now that are based on decisions made years ago and that cannot be undone. The Commission approved the Sunrise environmentally preferred route in 2008 and the line was energized in 2012. Asserting that risks have "significantly increased" compared to something that never happened (the construction of Sunrise on a route other than the environmentally preferred route), is not legitimate a basis for doing anything.

Mr. Sparks states that "The load shedding would be accomplished via an existing safety net special protection scheme. The safety net has two blocks of approximately 500 MW of load each. Therefore, if the ISO were to plan for only the G-1/N-1, we would need to shed 500 MW of load for the N-1-1 contingency. However, the incremental procurement difference between the G-1, N-1 and the N-1-1 criteria would only be approximately 150 to 300 MW, not 500 MW."

Here, CAISO appears to assume that if a controlled load-drop special protection scheme (SPS) were relied on to mitigate the adverse consequences of an N-1-1 contingency event, the SPS would have to be the "safety net" controlled load-drop SPS implemented by SDG&E in which case "500 MW" of load would be dropped. But there is no reason why this particular

[59] *Id.*, at page 6.

controlled load-drop scheme would have to be relied upon. The "safety net" could be modified to drop less load for different conditions, *e.g.*, 300 MW in recognition of the next most limiting G-1/N-1 contingency condition.

In addition, a completely different controlled load-drop scheme could be implemented to mitigate the N-1-1 contingency condition which establishes the LCRs for the Western LA basin sub-area (outage of the 230 kV Serrano-Lewis #1 line followed by outage of the Serrano-Village Park #2 line). Logically, the affected loads would be located in the LA basin area, not in the San Diego area.

CAISO provides no data to indicate what the "average" exposure to outages is, so it is not possible to reach an objective determination of whether the N-1-1 outage of the Sunrise Powerlink and Southwest Powerlink would create an unacceptable precedent for evaluating controlled load-drop as a mitigation solution for N-1-1 contingency events elsewhere within CAISO Balancing Authority.[60]

Mr. Sparks' testimony states that:

> "Mr. Millar, in his Track 1 rebuttal testimony presented a complete description of the deterministic planning standards embedded in the NERC reliability standards and how this methodology compares with a probabilistic evaluation of the transmission system. This portion of Mr. Millar's testimony, as well as a discussion of load shedding and the N-1-1 contingency was submitted in response to the opening testimony of CEJA witness Julia May, who in turn relied on testimony that Ms. Firooz presented in Docket A.11-05-023. In her Track 4 testimony, Ms. Firooz (at pages 5-6) simply has advanced the same arguments that have been considered and rejected by the Commission in two prior proceedings, without providing any new facts or evidence."[61]

CAISO incorrectly asserts that the Commission has already "rejected" Ms. Firooz's recommendation that controlled load-drop be considered as a potential solution for mitigating reliability standard violations that are identified for N-1-1 contingency conditions. CAISO's assertion is apparently based on its misunderstanding of Ms. Firooz's testimony concerning the

---

[60] *Id.*, at page 7.
[61] *Id.*, at page 12.

probability of an N-1-1 contingency event occurring during a one-year-in-ten peak load weather condition. Ms. Firooz never claimed that NERC's existing deterministic reliability standards are not currently applicable or that CAISO is free to apply different reliability standards, such as probabilistic reliability standards. Instead, Ms. Firooz has consistently made what should be a rather obvious point: When deciding how to *mitigate* identified violations of deterministic reliability standards, it is entirely appropriate to consider the probability of the contingency condition giving rise to the violation. If the probability of the contingency condition is very low, consumers may be better off being subjected to the remote possibility of not being served for a few minutes or hours, in exchange for the benefit of avoiding long-term (twenty to fifty year) commitments for hundreds of millions of dollars in infrastructure additions.

Because CAISO has inappropriately conflated Ms. Firooz's testimony on event probability with probabilistic planning approaches, it reaches the incorrect conclusion that the Commission has already "rejected" Ms. Firooz's recommendation that controlled load-drop be considered as a potential *solution* for mitigating violations of existing deterministic reliability standards. So far as the City knows, the Commission has never determined that controlled load-drop should not be considered when evaluating potential mitigation solutions for N-1-1 contingency conditions.

In response to Bill Powers on behalf of the Sierra Club, Mr. Sparks presented the following table to show that the addition of the 500 kV Sunrise Powerlink transmission line reduced the San Diego area LCR by 1100 MW (3800 MW – 2700 MW = 1100 MW).[62]

[62] *Id.* at pages 9-10.

		Base Case: Without Sunrise based on G-1/N-1 and 2500 MW N-1 WECC Path 44 Import Limit	With Sunrise based on G-1/N-1 and 3500 MW N-1 Import Limit	With Sunrise based on N-1-1
1	San Diego Area Load	5700 MW	5700 MW	5700 MW
2	Import Limit	2500 MW	3500 MW	not applicable
3	G-1	600 MW	600 MW	not applicable
4	LCR Need (Line 1 - Line 2 + Line 3)	3800 MW	2800 MW	2700 MW

Key numbers in the last column of the table above are wrong. The "Import Limit" in the last column of the table fails to account for the south-of-SONGS (path 44) path rating (2500 MW with any segment of the Southwest Powerlink out of service). Since, the N-1-1 contingency condition includes the outage of the 500 kV ECO-Miguel segment of the Southwest Powerlink, the 2500 MW path rating must be honored. Assuming--as CAISO's power flow studies normally do--that the 230 kV loop between Imperial Valley substation and Otay Mesa substation through the CFE Balancing Authority is opened in response to the N-1-1 contingency event, the San Diego area will be connected to the remainder of the WECC grid only through the south-of-SONGS path. Thus the "Import Limit" in the last column could not exceed 2500 MW. Subtracting 2500 MW from the one-year-in-ten load (5700 MW) means that the San Diego area LCR would be 3200 MW (5700 MW – 2500 MW = 3200 MW), not the 2700 MW as shown on Mr. Sparks' table. Accordingly, the addition of the Sunrise Powerlink actually reduced the San Diego area LCR by only about 600 MW (3800 MW - 3200 MW = 600 MW), not the 1100 MW claimed by Mr. Sparks in his rebuttal testimony.

If on the other hand, the south-of-SONGs path rating were raised, or eliminated altogether, and Mr. Sparks' 2700 MW number for the San Diego LCR is correct, then San Diego area LCR would be reduced as shown. But this reduction in LCRs would be attributable to the increased or eliminated south-of-SONGS path rating, not to the construction of the Sunrise Powerlink. If the path 44 rating limit can be increased or eliminated then the interesting question is why this possibility was not considered when the CAISO and the Commission were evaluating the need for the Sunrise Powerlink. In any event, if the Path 44 rating can be increased or

eliminated, consumers will likely save hundreds of millions of dollars in lower LCR compliance costs since San Diego area load-serving entities could meet a larger portion of their Resource Adequacy (RA) requirements from dependable capacity sources outside the San Diego LCR area (where competitive forces drive capacity prices down).

If on the other hand, the south-of-SONGs path rating were raised, or eliminated altogether, and Mr. Sparks' 2700 MW number for the San Diego LCR is correct, then San Diego area LCR would be reduced as shown. But this reduction in LCRs would be attributable to the increased or eliminated south-of-SONGS path rating, not to the construction of the Sunrise Powerlink. If the path 44 rating limit can be increased or eliminated then the interesting question is why this possibility was not considered when the CAISO and the Commission were evaluating the need for the Sunrise Powerlink. In any event, if the Path 44 rating can be increased or eliminated, consumers will likely save hundreds of millions of dollars in lower LCR compliance costs fsince San Diego area load serving entities could meet a larger portion of their Resource Adequacy (RA) requirements from dependable capacity sources outside the San Diego LCR area (where competitive forces drive capacity prices down). Importantly for consumers and the Commission, the costs of rerating or eliminating the south-of-SONGS path rating would be minimal; at most the cost of technical studies to demonstrate that such a change would not compromise grid reliability. The Commission should insist that SDG&E, SCE and CAISO directly address the risks and benefits of either uprating the south-of-SONGS path rating, or eliminating the path rating altogether.

Mr. Sparks also incorrectly states that:

> "...Ms. Firooz ignores the complexity of dropping load. The transmission grid is complex and many things can go wrong that impact reliability. Ms. Firooz does not appear to have taken these complexities into account in her probabilistic analysis which was limited to considering only one contingency condition....Ms. Firooz's analysis did not consider the potential risk associated with an armed load-shedding SPS inadvertently and unnecessarily shedding load when the system is not under stressed conditions. Given the complexities of communications and sensing equipment associated with the load

shedding scheme, this is a potential risk, and the magnitude of the risk is proportional to the amount of time that the scheme needs to be armed."[63]

CAISO's assertions that Ms. Firooz ignores the complexity of controlled load drop and considered "only one contingency condition" is simply incorrect. As an initial matter, Ms. Firooz considered a number of different contingency conditions, as set forth above. More to the point, Ms. Firooz has never claimed that controlled load-drop is 100% reliable. All electric systems, including controlled load-drop, are subject to possible failures. Ms. Firooz's point is that for mitigating the specific contingency condition giving rise to LCRs, controlled load-drop is more reliable than conventional generation solutions. Conventional generation facilities have many moving parts, fuel and other physical inputs, and complex control and communication systems. They could also be off line for planned outages or due to economics at the time of system stress (as was the case during the widespread September 8, 2011 outage in southern California). Controlled load-drop has virtually no moving parts, no fuel or other physical inputs, would rarely be unavailable because of planned outages, and would never be out of service for economic reasons.

CAISO implies that unlike a controlled load-drop SPS, conventional generation solutions do not have "the complexities of communications and sensing equipment." This is wrong. Conventional generating units have very complex communication and sensing equipment, both for internal operating purposes as well as for dispatch control by CAISO. Finally, the City agrees with CAISO's observation that the "magnitude of the risk is proportional to the amount of time that the scheme needs to be armed." In this regard the City notes that because one-year-in-ten peak load weather conditions are infrequent and generally predictable, a controlled load-drop scheme that reduces LCRs would need to be armed only on an infrequent basis.

Mr. Sparks later states that, "[f]urthermore, contrary to Ms. Firooz's statement, the NQC for gas fired generation, other than non-dispatchable small QFs, is not affected by forced outages."[64] CAISO misses the point that the generation at issue, is, in-fact, "non-dispatchable small QFs." Ms. Firooz believes that, based on a year-to-year comparison of NQC values,

[63] *Id.*, at page 14.
[64] *Id.*, at pages 16-17.

CAISO is likely under-counting capacity available from a number of non-dispatchable generators.

Mr. Sparks then asserts that "the outage of the 230 kV Serrano-Lewis #1 line followed by the outage of the Serrano-Village Park #2 line- an N-1-1 contingency…is not the worst contingency driving resource needs in the LA Basin with SONGS retired."[65] This statement is squarely at odds with CAISO's own no-SONGS analysis provided in CAISO Board-approved 2012-2013 transmission plan. Table 3.5-12 in the 2012-2013 transmission plan specifically identifies, for the no-SONGS scenario, the N-1-1 outage of the 230 kV Serrano-Lewis #1 line followed by the outage of the Serrano-Villa Park #2 line as the contingency condition setting LCRs for the Western LA basin sub-area. (See the row labeled "Category C" intersecting with the column labeled "W. LA.")

CAISO has not provided any explanation as to why the N-1-1 outage of the 230 kV Serrano-Lewis #1 line followed by the outage of the Serrano-Villa Park #2 line can now be ignored. Assuming the N-1-1 outage of the 230 kV Serrano-Lewis #1 line followed by the outage of the Serrano-Villa Park #2 line is not the "worst contingency," then what is? The Commission should have this information in hand before it decides on what amount of dependable capacity is needed in the Western LA basin sub-area. For the record, the City's LCR analysis indicates that the N-1-1 outage of the 230 kV Serrano-Lewis #1 line followed by the outage of the Serrano-Villa Park #2 line is the "worst contingency."

CONCLUSION

For all the foregoing reasons, the Commission should adopt the City's proposal.

Dated: November 25, 2013

Respectfully Submitted,

/s/
Andrew J. Brady
RICHARDS WATSON GERSHON
355 South Grand Avenue, 40th Floor
Los Angeles, CA 90071
Attorneys for:
CITY OF REDONDO BEACH

[65] *Id.*, at page 17.