

Application No.: A.11-05-023

Exhibit No.: _____

Witness: Robert Sparks

Application of San Diego Gas & Electric Company
(U902 E) for Authority to Enter into Purchase Power
Tolling Agreements with Escondido Energy Center,
Pio Pico Energy Center and Quail Brush Power

Application 11-05-023

**SUPPLEMENTAL TESTIMONY OF ROBERT SPARKS
ON BEHALF OF THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR
CORPORATION**

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**BEFORE THE PUBLIC UTILITIES COMMISSION OF THE
STATE OF CALIFORNIA**

Application of San Diego Gas & Electric Company
(U902 E) for Authority to Enter into Purchase Power
Tolling Agreements with Escondido Energy Center,
Pio Pico Energy Center and Quail Brush Power

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Q. What is your name and by whom are you employed?

A. My name is Robert Sparks. I am employed by the California Independent System Operator Corporation (ISO), 250 Outcropping Way, Folsom, California as Manager, Regional Transmission.

Q. Have you previously submitted testimony in this proceeding?

A. Yes, I have. On March 9, 2012 I submitted initial testimony addressing the need for generating resources in the San Diego area.

Q. Why have you submitted this supplemental testimony?

A. Specifically, after my initial testimony was served, SDG&E told the ISO that the newly revised WECC criterion for common corridor circuit outages would result in a reclassification of the Sunrise/IV Miguel double outage as a Category D contingency because the towers on the two lines are spaced less than 250' apart for less than 3 miles (which is the new WECC criteria). This re-categorization of the common corridor circuit outage as a Category D contingency required the ISO to re-assess its local studies. The purpose of my supplemental testimony is to describe the results of this re-assessment. In addition, in response to questions posed to me

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1 during an all-party conference call held on March 21, 2012, I will present some
2 additional information about the ISO's local capacity studies.

3

4 **Q. Were all of the local capacity area studies described in your initial testimony**
5 **revised as a result of this change in the WECC criterion?**

6

7 **A.** In my initial testimony, I described the results of the ISO's 2012 LCR study, which
8 is an annual assessment conducted through a stakeholder process during the first
9 two quarters of each year. I also discussed the ISO's once through cooling (OTC)
10 study results for the year 2021. This study was conducted in cooperation with
11 several state agencies as part of the 2011/2012 transmission planning process.
12 Finally, I discussed a mid-term local capacity area study, conducted for 2016, that
13 was posted separately on January 31, 2012 but discussed in the 2011/2012
14 transmission plan.

15

16 The ISO revised the OTC results for 2021 and I describe these results below. The
17 ISO recently completed its 2013 local capacity studies with the G-1/N-2 and with
18 the N-1-1 as the limiting contingency. Therefore, I am addressing the results of
19 these studies in lieu of updating the 2012 results. In addition, as noted in the 2016
20 local capacity study report, the differences in results between the 2012 results and
21 the 2016 results are due to load growth only which is a fairly predictable change.
22 Therefore the change in 2016 study results can be reasonably extrapolated based on
23 the change in 2013 study results provided below.

24

25 **Q. Please explain how the change in the WECC criterion impacted the ISO's OTC**
26 **local capacity studies for 2021 for the San Diego area.**

27

28 **A.** Prior to the change in the WECC criterion, the most limiting contingency for the
29 determination of LCR needs in the San Diego area was the simultaneous outage of
30 the 500 kV Sunrise Powerlink and the Imperial Valley-ECO 500 kV line

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1 overlapping with an outage of the Otay Mesa combined-cycle power plant (G-1/N-
2 2). The limiting constraint for this contingency is the South of SONGS Separation
3 Scheme. With this change to the WECC criterion, the most limiting contingency for
4 San Diego sub-area is the loss of Imperial Valley-Suncrest 500 kV line followed by
5 the loss of ECO-Miguel 500 kV line (N-1-1).

6
7 The table below shows the difference in study results between the two different
8 limiting contingency scenarios.

LCR Area	Contingency	Limiting Constraint	Traject(MW)	Env(MW)	ISO Base (MW)	Time(MW)
San Diego	G-1/N-2 (Assuming load shed)	8000 Amp limit on P44	LCR = 2,883** OTC = 531* - 950	LCR = 2,854** OTC = 231* - 650	LCR = 2,864** OTC = 231* - 650	LCR = 2,856** OTC = 421* - 840
		7800 Amp limit on P44 (2.5% margin)	LCR = 2,939** OTC = 520* - 939	LCR = 2,922** OTC = 299* - 718	LCR = 2,930** OTC = 299* - 718	LCR = 2,911** OTC = 470* - 889
San Diego	N-1-1 (No load shed)	8000 Amp limit on P44	LCR = 2,680 OTC = 318* - 737	LCR = 2,625 OTC = 0* - 402	LCR = 2,669 OTC = 218* - 637	LCR = 2,633 OTC = 201* - 620
		7800 Amp limit on P44 (2.5% margin)	LCR = 2,735 OTC = 373* - 792	LCR = 2,702 OTC = 60* - 479	LCR = 2,694 OTC = 243* - 662	LCR = 2,691 OTC = 260* - 679
		Voltage Collapse (accounting for 2.5% margin)	LCR = 2,646 OTC = 311* - 730	LCR = 2,524 OTC = 0* - 300	LCR = 2,663 OTC = 211* - 630	LCR = 2,553 OTC = 121* - 540

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12 * Lower OTC range value corresponds to the use of SDG&E-proposed generation
13 included in the Long-Term Procurement Plan. The numbers in the table identified
14 as OTC refer to an incremental local capacity need in the San Diego area driven by
15 the loss of OTC generation in the San Diego area. This need could be met by
16 repowering the existing OTC generation or by other new generation that is
17 connected to an electrically equivalent location.

18 ** Load curtailment of approximately 370 MW was simulated to achieve stability
19 under G-1/N-2 contingency.
20

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1 As can be seen in the results table, the continuing need for generation at the existing
2 OTC site (Encina) or in an electrically equivalent location is reduced from 950 MW
3 to 730 MW for the Trajectory 33% RPS portfolio study scenario. This assumes that
4 the 8000 Amp limit due to the SONGS separation scheme is removed from being a
5 binding constraint. With the 419 MW of SDG&E proposed generation procurement,
6 the need amount is reduced from 531 MW to 311 MW. Need amounts are also
7 provided with the 8000 Amp limit on the Path 44 (SONGS separation scheme) as a
8 binding constraint and with a 2.5% margin from hitting that constraint. Need
9 amounts based on the other three 33% RPS portfolio study scenarios are also
10 provided in the table.

11

12 **Q. Did this change cause the ISO to change its LCR study methodology in any**
13 **way?**

14

15 **A.** No. However, because the G-1/N-2 contingency is a severe contingency we
16 conceptually assumed that an automatic load shedding scheme (SPS) would be
17 installed and available to prevent voltage collapse for that contingency in our earlier
18 results. With the more likely N-1-1 contingency we did not think it would be
19 prudent to plan the system that would rely on the same type of load shedding SPS.

20

21 **Q. Please explain how the change in the WECC criterion impacted the ISO's 2013**
22 **local capacity studies for the San Diego area.**

23

24 **A.** Similar to the OTC 2021 studies, prior to the change in the WECC criterion, the
25 most limiting contingency for the determination of LCR needs in the San Diego area
26 was the simultaneous outage of the 500 kV Sunrise Powerlink and the Imperial
27 Valley-ECO 500 kV line overlapping with an outage of the Otay Mesa combined-
28 cycle power plant (G-1/N-2). The limiting constraint for this contingency is the
29 South of SONGS Separation Scheme. With this change to the WECC criterion, the
30 most limiting contingency for San Diego sub-area is the loss of Imperial Valley-

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1 Suncrest 500 kV line followed by the loss of ECO-Miguel 500 kV line (N-1-1).
2 The table below shows the difference in 2013 LCR study results between the two
3 different limiting contingency scenarios.

Area	Contingency	Limiting Condition	LCR (MW)
San Diego	G-1/N-2: Otay + Sunrise + SWPL (No load shed)	Voltage Collapse	2863
San Diego	N-1-1: Sunrise followed by SWPL (No load shed)	Voltage Collapse	2570 (Accounting for 2.5% margin for N-1-1)

5
6 As can be seen in the results table, the San Diego area LCR needs were reduced
7 from 2863 MW to 2570 MW. It is important to note that these studies assumed that
8 both SONGS units were operating.

9
10 **Q. Were the results for the IV-San Diego area and the Encina sub-area affected by**
11 **the change in WECC criterion for Sunrise Powerlink/IV-Miguel?**

12
13 **A.** No. The most limiting contingency in the Greater Imperial Valley-San Diego (IV-
14 San Diego) area is described by the outage of 500 kV SWPL between Imperial
15 Valley and N. Gila substations overlapping with an outage of the Otay Mesa
16 combined-cycle power plant (603 MW), while staying within the South of San
17 Onofre (WECC Path 44) non-simultaneous import capability rating of 2,500 MW.
18 The most limiting contingency for the Encina sub-area of the San Diego local
19 capacity area is the loss of Encina 230/138 kV transformer followed by the loss of
20 the Sycamore-Santee 138 kV line which could thermally overload the Sycamore-
21 Chicarita 138 kV line. Neither of these limiting contingencies is affected by the
22 new WECC criterion, and therefore the results of the studies were not affected in
23 either of these areas.

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1 **Q. If the South of SONGS separation scheme were removed as a binding**
2 **constraint, would the revised study results be affected?**

3
4 **A.** The 2013 LCR study results are driven by a voltage collapse constraint, so those
5 results would not change. The 2021 study results are provided with and without the
6 SONGS separation scheme as a binding constraint. With the N-1-1 as the limiting
7 contingency, removing the SONGS separation scheme as the binding constraint
8 would reduce the LCR needs by about 30 to 180 MW, depending on the 33% RPS
9 scenario.

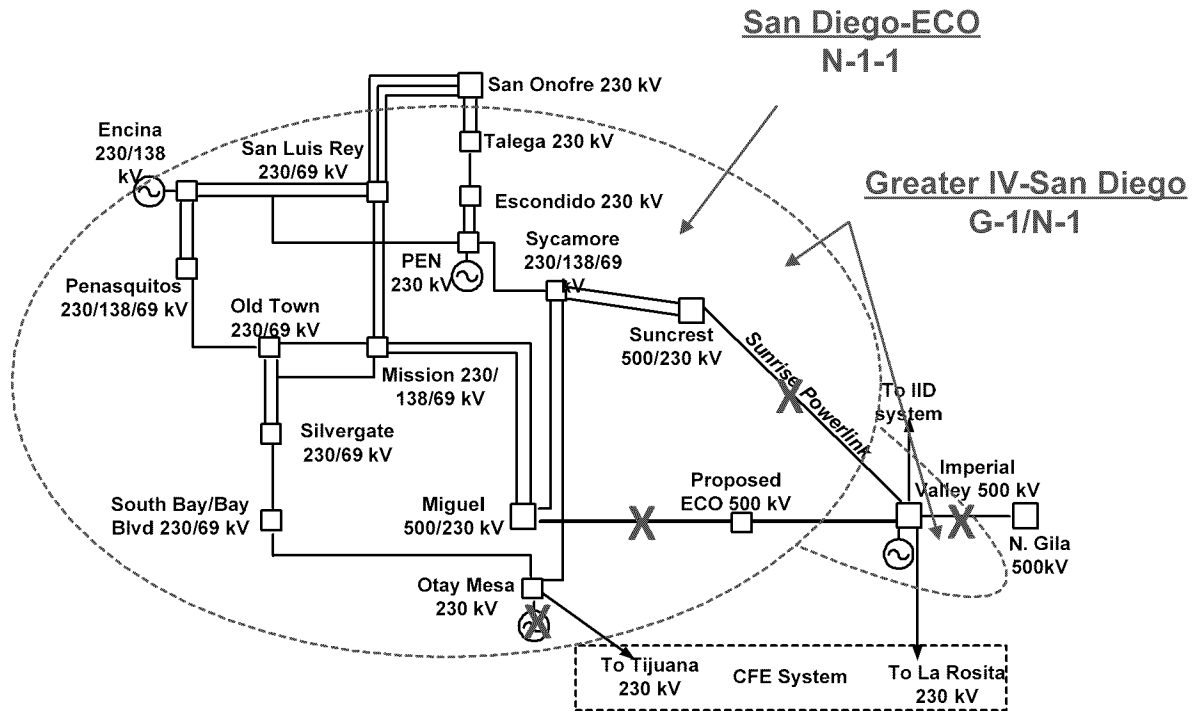
10
11 **Q. Why is there a San Diego local area and a San Diego/IV local area?**

12
13 **A.** The most limiting contingency in the Greater San Diego-Imperial Valley area is
14 described by the outage of 500 kV Southwest Power Link (SWPL) between
15 Imperial Valley and N. Gila Substations over-lapping with an outage of the Otay
16 Mesa Combined-Cycle Power plant (603 MW) while staying within the South of
17 San Onofre (WECC Path 44) non-simultaneous import capability rating of 2,500
18 MW. The most limiting contingency for San Diego sub-area is the loss of Imperial
19 Valley-Suncrest 5000 kV line followed by the loss of ECO-Miguel 500 kV line. The
20 limiting constraint is post-transient voltage instability or the South of SONGS
21 separation scheme. These two contingencies are depicted in the following diagram.

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As shown in the diagram the difference between the two areas is determined by the different separation points which result from the two different limiting contingencies. The San Diego area limiting contingency separates the Imperial Valley substation from the rest of the San Diego area, whereas the IV-San Diego limiting contingency does not. This is why the Imperial Valley substation is not in the San Diego area and is in the IV-San Diego area.

Q. In your initial testimony you described the sensitivity study conducted in the transmission planning process that considered the Pio Pico, Quail Brush and Escondido Energy Center resources under consideration in this proceeding (pages 10-12). Can you provide further information about this study?

A. Yes, I can. It is important to remember that the sensitivity study included two changes to the study assumptions. First we assumed that the Encina generation would be completely retired, and that Carlsbad Energy Center would not be built.

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1 Second we assumed that Pio Pico, Quail Brush and Escondido Energy Center
2 resources would be built. The additional transmission upgrades identified in the
3 sensitivity study are driven by the combination of these two assumptions. If
4 Carlsbad were added to the sensitivity case with Pio Pico and Quail Brush then the
5 additional overloads identified in the sensitivity study would be eliminated except
6 for the Miguel-Bay Boulevard 230 kV line overload. However, as stated above, this
7 overload can be mitigated by stringing additional conductor on the currently empty
8 side of the double circuit tower line.

9

10 **Q. Does this conclude your supplemental testimony?**

11

12 **A. Yes, it does.**