Docket:		A.12-05-020
Exhibit Number	:	
Commissioner	:	Michael Picker
Admin. Law Judge	:	Darwin Farrar
ORA Witness	:	Charles Mee
	:	
	:	

OFFICE OF RATEPAYER ADVOCATES
CALIFORNIA PUBLIC UTILITIES COMMISSION

CORRECTED
PREPARED TESTIMONY OF CHARLES MEE
ON
SOUTH ORANGE COUNTY RELIABILITY ENHANCEMENT PROJECT
(SOCREP)

~~**(CONFIDENTIAL VERSION)**~~

San Francisco, California
May 26, 2015
Corrected November 30, 2015

156162847

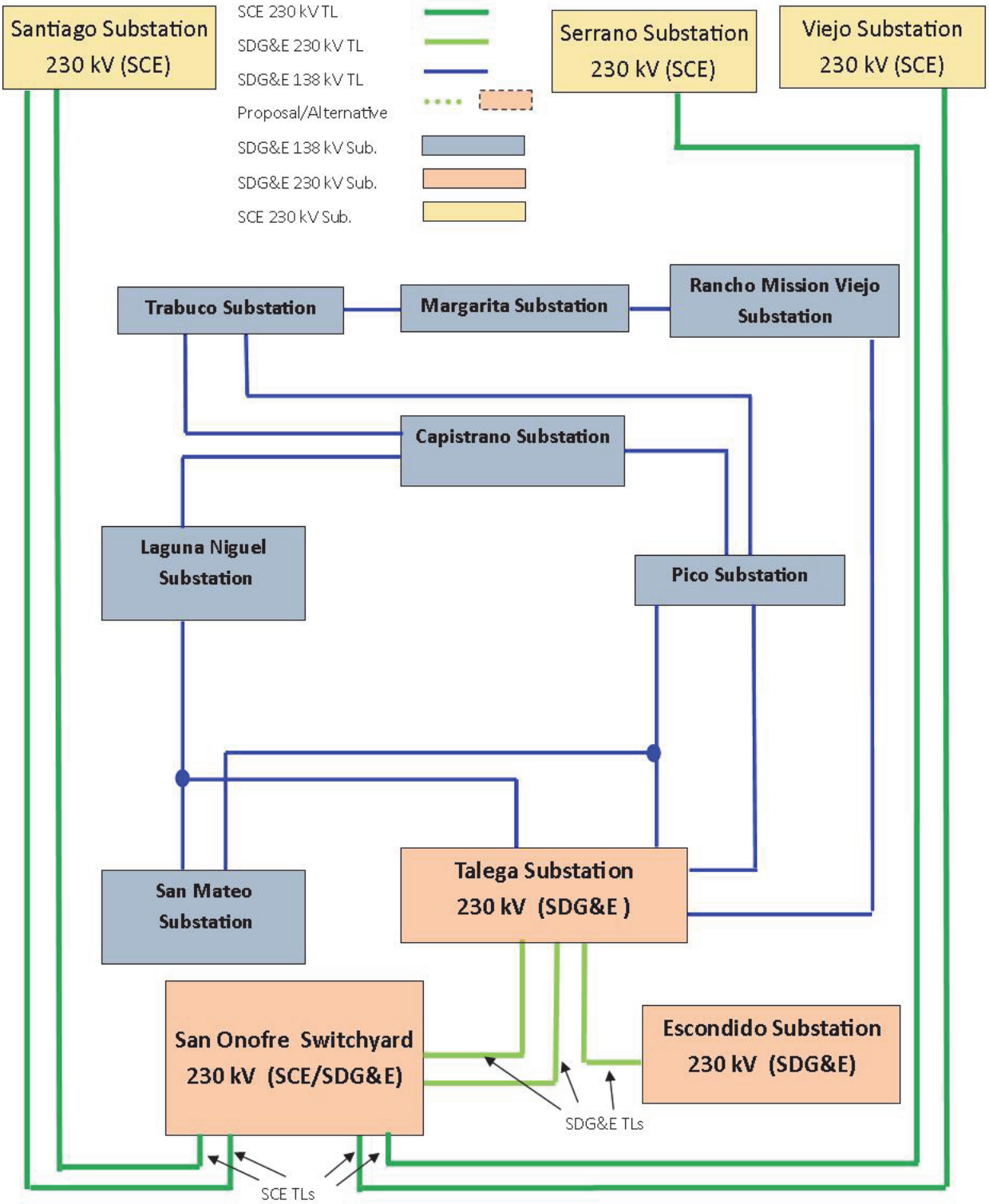
(Witness: Charles Mee Testimony)

Q.1. Please describe SDG&E's current transmission infrastructure that provides service to the South Orange County (SOC) area.

A.1. As shown in Figure 1 below, San Diego Gas & Electric (SDG&E) currently provides service to the SOC area from the Talega Substation through three 230 kilovolt (kV) lines that are connected to the Talega Substation. One line is from Escondido Substation, the other two lines are from Son Onofre Switchyard. Since the SOC area is a local network area, the NERC reliability standards are not applicable. According to the CAISO planning standard, under category B (N-1) contingencies, interruption of transmission service to the SOC area is allowed but should not be more than 250 megawatt (MW).

Figure 1: Existing South Orange County Electrical Interconnection

Confidential



Q.2. Please describe SDG&E's Proposed Project.

A.2. As shown in Figure 2, SDG&E is proposing to construct the following project: [1]

1) Build a new 230kV partially enclosed gas insulated substation at the existing 138/12 kV Capistrano Substation site, within SDG&E's existing property;

2) Relocate, rebuild and expand the existing 138 kV facility with a new partially enclosed gas insulated substation, within SDG&E's existing property;

3) Relocate, rebuild and expand existing 12 kV facilities within SDG&E's existing Capistrano Substation property;

4) Replace an existing 138 kV transmission line (TL) 13835, with a new 230kV double-circuit extension between SDG&E's Capistrano and Talega Substations, described as follows:

- Build approximately 7.5 miles of new overhead double-circuit 230kV transmission lines, within SDG&E's existing right of way (ROW);
- Acquire new ROW for approximately 0.25 miles of new overhead 230kV transmission line adjacent to SDG&E's Talega Substation;
- Replace 0.36 miles of existing 138kV underground transmission system with one new 230kV underground transmission line within SDG&E's existing Vista Montana street easement position; and
- Install 0.36 miles in franchise position within Vista Montana Street one 230kV underground transmission line.

5) Realign existing 69kV and 138kV transmission lines near the Talega Substation;

6) Relocate the three existing 138kV transmission lines from the Capistrano Substation into the new San Juan Capistrano Substation. Loop-in the two 138kV transmission lines that currently bypass the existing substation into the new San Juan

[1] SDG&E Application at 4-5.

Capistrano Substation. Underground all of the westbound 138kV transmission line getaways;

7) Install approximately 81 new steel transmission line poles (49 230kV poles, 23 138kV poles, and 9 69kV poles);

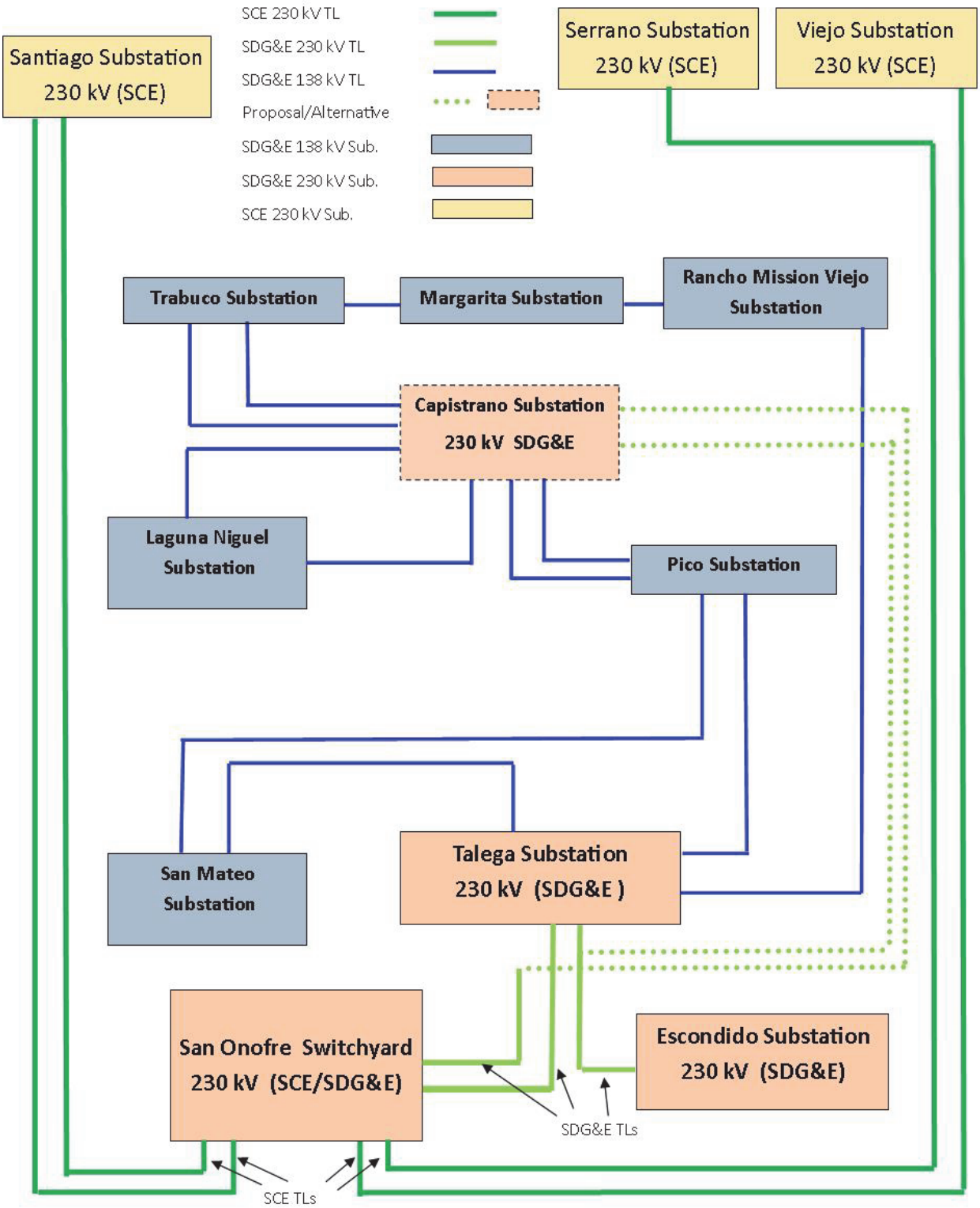
8) Remove approximately 86 wood structures/poles, 12 steel poles, and 5 steel lattice towers;

9) Reconfigure the Talega Substation to accommodate the new TL13835 connection; and

10) Undertake other activities required to implement the Proposed Project, including upgrading the communications, controls and relays for corresponding facilities, as required.

Figure 2: SDG&E Proposed Project Electrical Interconnection

Confidential



1

Q.3. What are the actual problems in the SOC area?

A.3. SDG&E asserts that there are currently many violations to the NERC reliability standards in the SOC area.[2] ORA does not agree with SDG&E's assertions. The SOC area is a local network area, and NERC reliability standards do not apply to local network areas. [3] According to the CAISO planning standards, interruption of transmission service up to 250 MW demand in the SOC area, when necessary, is allowed. Accordingly, the reliability problems in the SOC area as asserted by SDG&E do not violate the NERC reliability standards. So no project is needed to address SDG&E's asserted problems in order to comply with the NERC reliability standards.

SDG&E describes some extreme events in its application, such as the potential for an outage at both the 230 kV and the 138 kV buses at the Talega Substation. These extreme events can be considered as Category D events under NERC standards. While these events are required to be studied, no mitigation action is required. However, ORA observes that SDG&E describes some transformer location and electrical configuration problems at the Talega Substation. For example, transformer banks #60 and #62 are too close to the control rooms. If one of the transformers were to be on fire, the control room would not be accessible. Also, transformers #60 and #63 are directly interconnected to the 230 kV buses. If any of them has a fault, the interconnected bus must be de-energized to isolate the fault transformer from the power system.[4] In order to solve the problems, SDG&E discusses a solution to fix the configuration problems in Talega Substation as follows:

---

[2] SDG&E January Testimony at 50-66.

[3] Footnote (b) of the NERC Reliability Standard TPL-003-0.

[4] SDG&E January Testimony at 11.

1 **1)** Remove Bank #60 (with capacity of 162 MVA) and Bank #62
2 (with capacity of 150 MVA), and

3 **2)** Reconfigure Bank #63 (with capacity of 392 MVA) to be fed
4 from a more reliable breaker-and-a-half configuration. [5]

5 **Q.4.** Can SDG&E fix the Talega Substation problems within the Talega Substation
6 footprint?

7 **A.4.** Yes. It is normal practice to shutdown part of a substation to do maintenance,
8 while allowing the other part to stay energized to supply power. In order to safely
9 do so, the maintenance crew must follow safety procedures. SDG&E asserts there
10 are poor engineering problems at the Talega Substation that need to be fixed. [6]
11 Although SDG&E mentioned, in the Preliminary Environmental Assessment
12 (PEA), the idea of rebuilding the Talega Substation to address these poor
13 engineering problems, it did not pursue this alternative because SDG&E asserts
14 that it is not feasible to do so.[7]
15 ORA observes that without SDG&E's Proposed Project, it is possible for SDG&E
16 to fix the asserted engineering problems at Talega Substation. SDG&E can
17 remove transformer banks #60 and #62, and then reconfigure transformer bank
18 #63 so that it can be fed from a more reliable breaker-and-a-half configuration.
19 ORA understands that during this reconfiguration exercise, there will be only one
20 230/138 kV transformer bank, with a capacity of 392 megavolt-ampere (MVA),
21 supplying power to the SOC area, which is less than the peak demand of 443.3
22 MW. However, SDG&E could perform this reconfiguration exercise during off-
23 peak hours. ORA is aware that during maintenance, the power supply of the
24 energized transformer could also be interrupted; however, with careful safety
25 procedure in place the risk of interrupting power supply can be minimized. After

---

[5] SDG&E January Testimony at 86-87.

[6] SDG&E January Testimony at 10-11.

[7] SDG&E PEA at 5-13.

the reconfiguration is completed, power supply to the SOC area would be improved.

Q.5. Will SDG&E's Proposed Project address the actual configuration problem at Talega Substation?

A.5. SDG&E's Proposed Project will not address the engineering problems at Talega Substation.

SDG&E's Proposed Project is a workaround approach that does not fix the root problems at Talega Substation. SDG&E asserts that after the construction of the Proposed Project, SDG&E will be able to fix the problems at Talega Substation.[8] In other words, SDG&E's Proposed Project does not ultimately solve the problems at Talega Substation, but is only one of the steps toward fixing the Talega Substation problems. ORA observes that SDG&E would still have engineering problems at the Talega Substation after the construction of the Proposed Project.

Q.6. Does ORA have concerns with the cost of SDG&E's Proposed Project?

A.6. Yes. SDG&E estimates that its Proposed Project will cost approximately $420 million,[9] in addition to ongoing annual operation and maintenance costs at ratepayers' expense.[10] This is an unnecessary expense and unnecessary workaround toward fixing the actual problems at Talega Substation.

Today, the coincident peak load in the SOC area is not more than 443.3 MW,[11] but the total power supply capacity of the four transformer banks at Talega Substation is around 1,100 MVA, which could provide as much as 1,100 MW of real power. Talega Substation has more than double the power supply capacity to

---

[8] SDG&E January Testimony at 11, "The project …. allowing removal of two transformers from Talega Substation and reconfiguration of Talega within the existing substation footprint."

[9] SDG&E Supplemental Prepared Testimony at 125, $381 million plus 10%.

[10] SDG&E Supplemental Prepared Testimony at 125.

[11] SDG&E Supplemental Testimony at 55.

serve the SOC area. Even if two of the old banks (Bank #60 with 162 MVA and Bank #62 with 150 MVA) at the Talega Substation are removed, the substation would still have a power supply capacity of 784 MVA (Bank #61 with 392 MVA and Bank #63 with 392 MVA) to serve the SOC area load.

Furthermore, after the Proposed Project is constructed, there would be excess power supply capabilities to the SOC area that are not needed. This excess power supply would lead to unnecessary transmission over build and sunk costs at ratepayers' expense. Because the proposed project does not address the actual engineering problems at the Talega Substation, it would result in overbuilding unneeded transmission.

Q.7. SDG&E asserts that its Proposed Project will provide two sources of power supply to the SOC area. Does ORA have any concerns with this assertion?

A.7. Yes. I will answer this question in two parts:

Part 1: In order to increase the power supply flexibility, SDG&E intends to have a second power supply to the SOC area. With two power supplies to the SOC area, when one of the power supplies is not available, the other power supply can still provide power to the SOC area. While SDG&E's Proposed Project will provide two 230 kV power supply sources to the SOC area, the two sources are not truly independent from each other. According to SDG&E's Proposed Project, there would be two 230-kV transmission lines supplying power to the upgraded Capistrano Substation. [12]

(a) The first proposed 230 kV transmission line would be the tap-off of the Escondido-Talega transmission line (see Figure 2). However, ORA observes that if there is an outage on the Escondido-Talega transmission line, the tap-off transmission line would also lose power, so both Talega Substation and Capistrano Substation would lose one 230 kV power supply at the same time.

---

[12] CPUC Draft EIR Figure 1-2.

(b) The second proposed 230kV transmission line would be the extension of one of the existing double-circuit 230 kV San Onofre Switchyard-Talega transmission lines (see Figure 2). The double-circuit San Onofre Switchyard-Talega transmission lines share the same towers. If one of the towers falls down or is damaged by a wildfire or by other natural disaster at the ROW, the two transmission lines, including the extension from Talega Substation to Capistrano Substation, would lose power at the same time. As a result, both Talega and the upgraded Capistrano Substation will lose one power supply at the same time.

(c) From a geographic perspective, since all three 230 kV transmission lines would go through Talega Substation first and are geographically close to each other, the Proposed Project may not be able to effectively improve power supply reliability for the SOC area. The new 230 kV double circuit transmission lines supplying power to the upgraded Capistrano Substation would be extensions of the two existing transmission lines (the single circuit Escondido-Talega transmission line and one of the double circuit San Onofre Switchyard-Talega transmission lines). Thus, if disaster such as fire, explosion, earthquake, vandalism, or terrorism[13] occurs at the existing transmission lines, near the Talega Substation, the existing transmission lines as well as the new transmission lines connected to the upgraded Capistrano Substation could lose power at the same time. This would result in both the Talega Substation and the Capistrano Substation losing power at the same time and the whole SOC area load being disrupted. According to Frontlines, "[m]uch of the Proposed SOCREP Project is located within heavily developed regions in high fire zone area,"[14] and the risks of fire near Talega

[13] SDG&E January Testimony at 11.

[14] Motion to accept late-filed protest of Forest Residents opposing new transmission lines (Frontlines) filed on June 22, 2012, at 4.

Substation are not low. SDG&E also notes that wild fire risk and seismic risk exist at the Talega Substation. [15]

Based on the above analysis, ORA observes that SDG&E's Proposed Project does not provide two electrically independent and geographically distant power sources to the SOC area. Therefore, the Proposed Project does not effectively provide two independent 230 kV power sources to the SOC area, but only provides limited reliability improvements to the SOC area. SDG&E's costly proposal is unreasonable.

Part 2: The Proposed Project is at odds with the asserted problems that SDG&E points out.

In its Supplemental Testimony, SDG&E discusses different kinds of risks associated with third party actions that could impact the reliability of the Talega Substation.[16] However, SDG&E's solution is to construct more transmission lines at the same location. The approach is at odds with the general approach of diversity in addressing SDG&E's perceived third party actions that could impact the reliability of the Talega Substation. In order to avoid or mitigate these potential third party actions, one approach of diversity would be to spread the mitigating measures throughout SDG&E's transmission system, so that the risks and vulnerabilities of the infrastructure systems from these potential third party actions can be reduced. SDG&E's approach is to concentrate all the mitigating measures together in the same approximate geographic locations. Doing so will not effectively mitigate the risks and/or vulnerabilities of SDG&E's transmission system regarding potential third party actions.

Based on the above, ORA recommends that the Commission reject SDG&E's Proposed Project.

---

[15] SDG&E Supplemental Testimony at 9-17.

[16] SDG&E Supplemental Testimony at 17-39.

Q.8. To the extent that the Commission finds that the Talega Substation engineering problems cannot be fixed within the Talega Substation footprint and power supply flexibility in the SOC area needs to be improved, does ORA propose other project alternatives to the Proposed Project?

A.8. Yes. To the extent that the Commission finds that the Talega Substation engineering problems cannot be fixed within the Talega Substation footprint and power supply flexibility in the SOC area needs to be improved, ORA has two project alternatives to more effectively, economically and technically provide a second power supply to the SOC area in order to increase power supply flexibility and allow SDG&E to fix the Talega Substation engineering problems.

The first alternative is to interconnect the Trabuco Substation to the Southern California Edison (SCE) transmission system. The second alternative is to interconnect the Pico Substation to the SCE transmission system.

Under each alternative, SDG&E can use the additional power source to maintain the power supply to SOC area load during off-peak hours and shutdown the entire Talega Substation during those off-peak hours to fix the Talega Substation engineering problems. [17]

Q.9. Please describe ORA's proposed Trabuco alternative project

A.9. ORA proposes to interconnect SDG&E's Trabuco Substation to SCE's San Onofre – Santiago transmission line (see Figures 3-1, 3-2, and 3-3). To complete this project, ORA recommends the following:

(1) Acquire approximately 2 acres of land on the north side of the Trabuco Substation.

(2) Construct a 230-kV switchyard on the acquired 2 acres, including one 230kV/138kV transformer with a capacity of 392 MVA.[18]

---

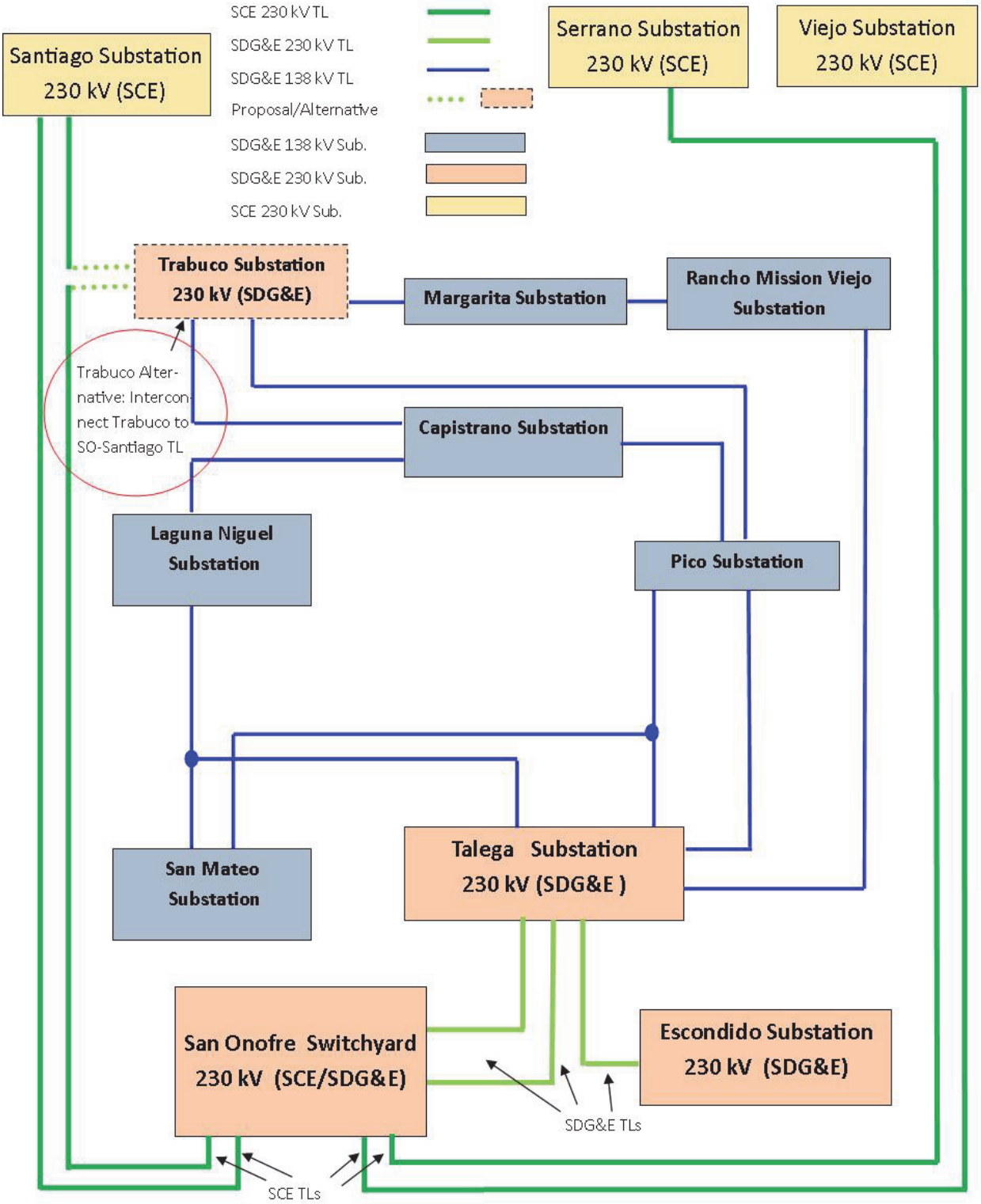
[17] SDG&E January Testimony at 86-87.

[18] SDG&E Supplemental Testimony at 6.

(3) Construct approximately 0.5 miles of double circuit transmission line from the San Onofre Switchyard-Santiago 230 kV transmission line to the 230 kV yard at the Trabuco Substation. The San Onofre Switchyard-Santiago 230-kV transmission line would become two new transmission lines: the San Onofre Switchyard-Trabuco 230 kV transmission line and the Trabuco-Santiago transmission line. Based on ORA's preliminary analysis, the point of interconnection should be at the San Onofre Switchyard-Santiago transmission lines on the east side of the San Diego Freeway (Interstate-5). From there, the interconnection would follow Puerta Real, over Interstate-5. The termination would be at the 230 kV yard, with the electric system components described in (2) above.

(4) Separate the SOC load into two parts by setting some of the 138 kV circuit breakers "Normal Open". Under normal operating conditions, the existing Talega Substation will supply one part of the SOC load and the upgraded Trabuco Substation will supply the other part of the SOC load. When one of the 230 kV power supplies (for example, Talega Substation) is not available, the "Normal Open" circuit breakers can be closed so the other 230 kV power supply (for example, Trabuco Substation) can supply critical load to the whole SOC area.

Figure 3-1: ORA Proposed Trabuco Alternative Electrical Interconnection **Confidential**



1

Figure 3-2: Trabuco Substation is 0.5 mile from the SCE 230 kV transmission lines

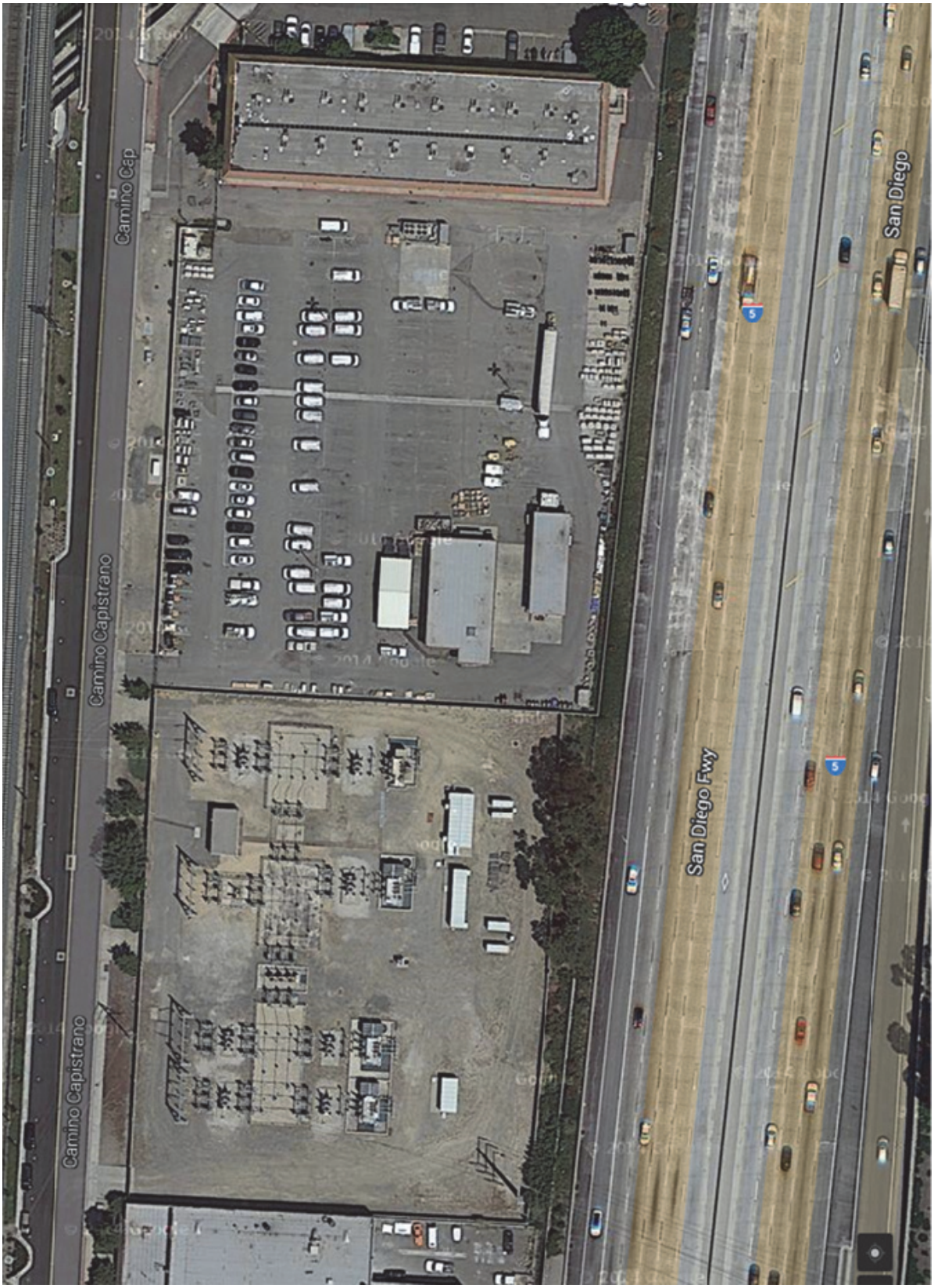


Figure 3-3 The parking lot next to the Trabuco Substation can be used for the 230 kV switchyard

Q.10. Why is ORA's proposed Trabuco Substation alternative more effective than SDG&E's Proposed Project?

A.10. The Trabuco Substation alternative would be more effective in addressing the potential reliability problem for the SOC area. This is because this alternative will have two real independent power supply sources to the SOC area: one from the Talega Substation in the south of SOC and the other from the upgraded Trabuco Substation in the north of SOC. Since the two power supply sources do not share the same right of way (ROW), the probability of both power supply sources being unavailable at the same time will be extremely low. In other words, with two independent power supply sources, the reliability of the power supply to the SOC area will be more secure.

In addition, SDG&E can use the power supply source from the 230/138 kV transformer bank, with a capacity of 392 MVA constructed at Trabuco Substation, to serve SOC load from 6pm to 2pm the next day, even on a high load consumption day. [19] With this second power supply source from the Trabuco Substation, SDG&E could shut down the whole Talega Substation and conduct maintenance on the Talega Substation from 6pm to 2pm the next day.

Q.11. What is the estimated cost for ORA's Trabuco Substation alternative?

A.11. ORA's cost estimates are provided in Table 1. These cost estimates do not include the costs of rebuilding Capistrano Substation as a 138/12 kV substation, or the cost of reconfiguring the Talega Substation.

---

[19] SDG&E Supplemental Testimony at 73, Figure 3-2: South Orange County Load Profile with Installed PV MW Nameplate Profile.

Table 1: Cost Estimation for Trabuco Alternative ($Million)	
Trabuco 230kV Yard Land	3.0
Trabuco 230kV transformer	9.0
230 kV Breaker and a Half	5.0
Double Operating Bus Sections - 2 new buses, spanning 2 positions	2.0
230 kV Double Circuit Transmission Lines w/ 6 Tubular Steel Poles & Anchor Bolt Foundations	3.0
ROW Acquisition	1.0
Allowance for funds used during construction (AFUDC)	4.6
Total	27.6

Q.12. Please describe ORA's Pico Substation proposal.

A.12. ORA also identifies the Pico Substation alternative (see Figure 4-1). SDG&E's Pico Substation is approximately 225 feet away from SCE's 230 kV transmission lines. In order to provide a second power supply source to the SOC area from the Pico Substation, ORA recommends the following:

1) Use the existing ROW or acquire land next to the Pico Substation and construct a 230 kV yard.

2) Install a 230/138 kV transformer with a capacity of 392 MVA, and loop in one of SCE's 230 kV transmission lines to the Pico 230 kV switchyard.

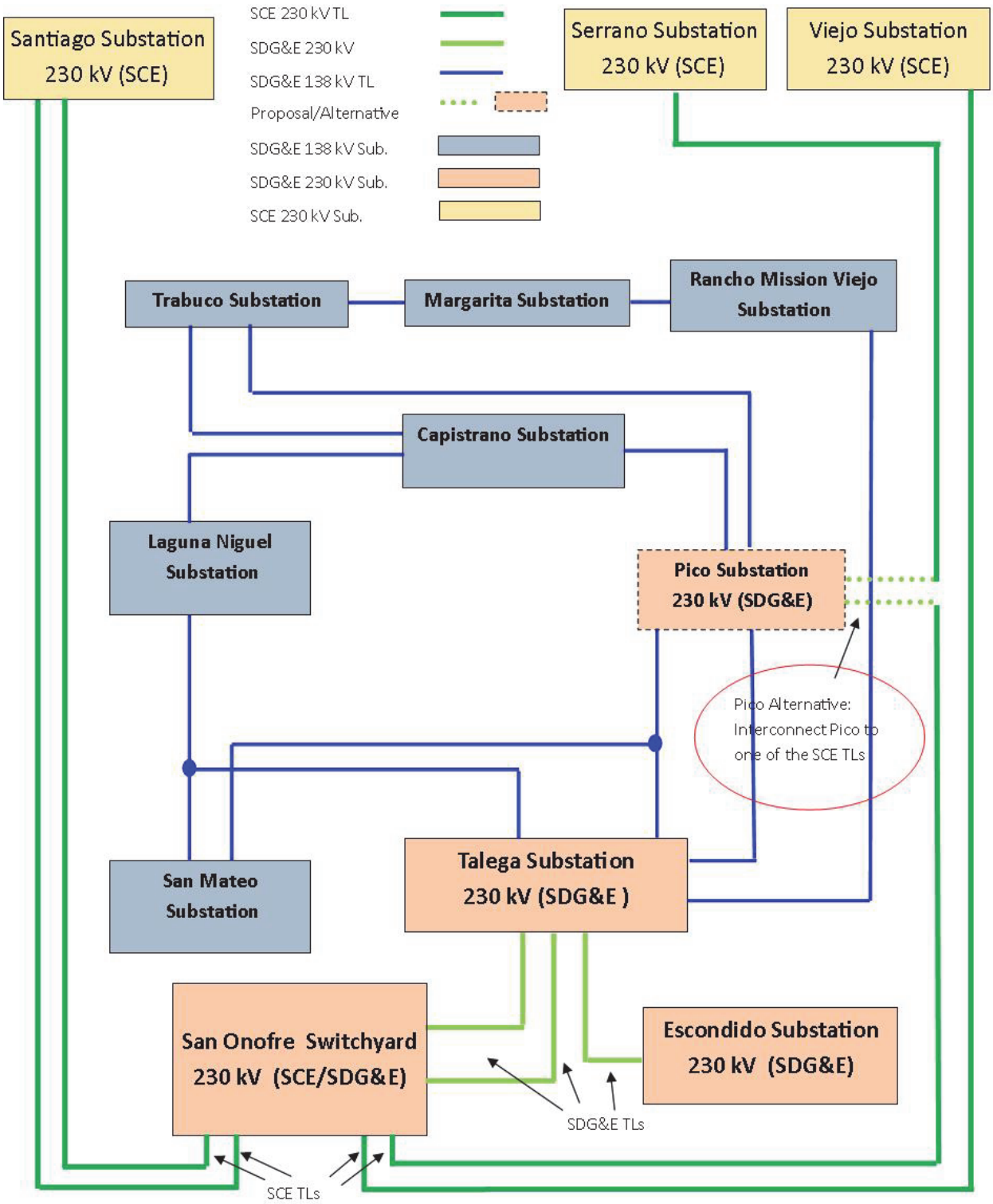
3) Construct a 138 kV bus position at the 138 kV yard.

4) Connect the 138 kV side of the 230/138 kV transformer to the 138 kV bus position.

5) Separate the SOC load into two parts by setting some of the 138 kV circuit breakers "Normal Open". Under normal operating conditions, the existing Talega Substation will supply one part of the SOC load and the upgraded Pico Substation will supply the other part of the SOC load. When one of the 230 kV power supplies (for example, Talega Substation) is not available, the "Normal Open" circuit breakers can be closed so the other 230 kV power supply (for example, Pico Substation) can supply critical load to the whole SOC area.

Figure 4-1: ORA Proposed Pico Alternative Electrical Interconnection

Confidential



1

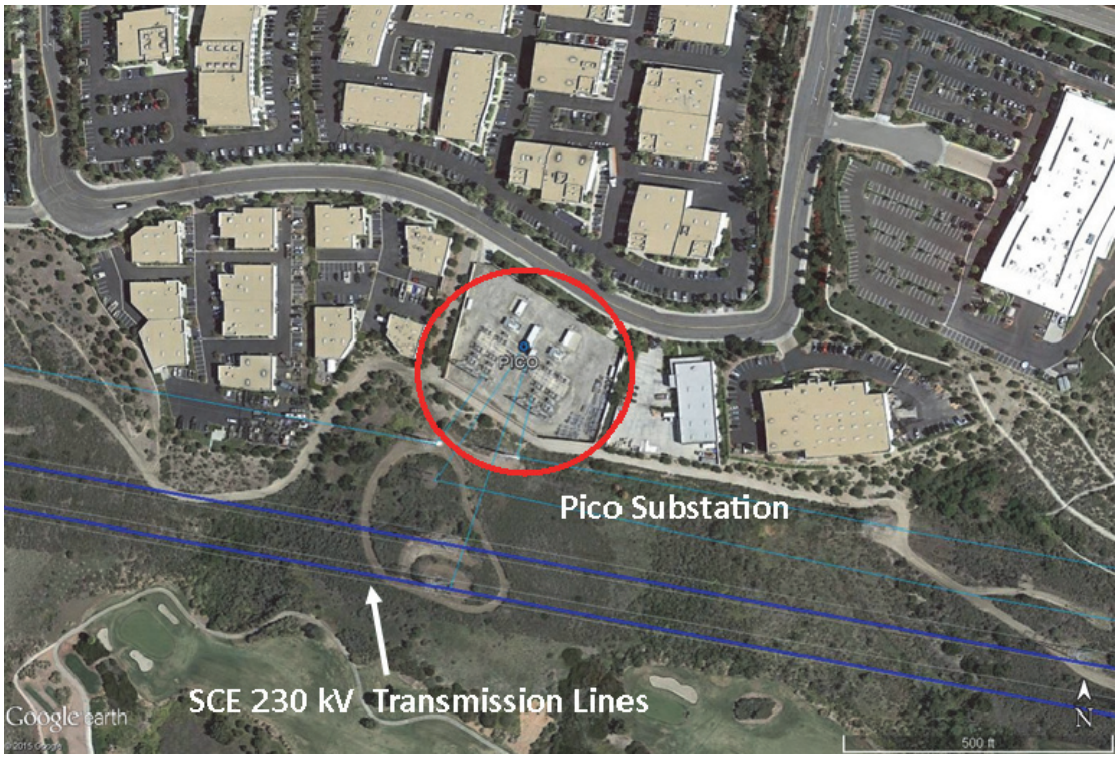


Figure 4-2: Pico Substation is only 225 feet from the SCE 230 kV Transmission Lines

Q.13. Why is ORA's Pico Substation alternative more effective than SDG&E's Proposed Project?

A.13. Similar to the Trabuco Substation alternative, the Pico Substation alternative will be more effective in improving reliability for the SOC area. This is because this alternative will have two real independent power supply sources to the SOC area: one from the Talega Substation and the other from the upgraded Pico Substation. Since the two power supply sources do not share the same ROW, they are considered to be two independent power supply sources.

Q.14. What is ORA's estimated cost for its Pico Substation alternative?

A.14. ORA's cost estimates are provided in Table 2. These cost estimates do not include the costs of rebuilding Capistrano Substation as a 138/12 kV substation, or the cost of reconfiguring the Talega Substation.

Table 2: Cost Estimation for Pico Substation Alternative ($Million)	
Pico 230 kV Yard Land	3.0
Pico Substation 230/138 kV transformer	9.0
230 kV Breaker and a Half	5.0
Double Operating Bus Sections - 2 new buses, spanning 2 positions	2.0
Allowance for funds used during construction (AFUDC)	3.0
Total	22.0

Q.15. Does ORA have a response to SDG&E's concerns with interconnecting its SOC load with SCE's transmission systems?

A.15. ORA will respond to this question in two parts:

First, SDG&E raised timing issues regarding interconnecting its SOC load to SCE's system. SDG&E asserts that "any interconnection to SCE's system would take years to accomplish." SDG&E referred to SCE Transmission Owner Tariff and Transmission Control Agreement.[20]

ORA disagrees with SDG&E's assertion. SOC load is not new, but has existed for many years. SCE and the CAISO are both aware of the existence of the SOC load. Whether the SOC load is interconnected to the SDG&E system or interconnected to the SCE system, the impact on the CAISO controlled grid will be similar. The reasons are:

1) The SOC load is located at the "border" of the SDG&E and SCE transmission systems. The distance between Talega Substation and the Trabuco or Pico Substations, is approximately 10 miles. To a 230 kV transmission system, the impedance of a 10 mile transmission line is negligible.

2) Both SDG&E's and SCE's transmission systems were turned over to CAISO operational control almost 20 years ago. Both

[20] SDG&E Supplemental Testimony at 100.

SCE's and SDG&E's transmission systems are now integrated as parts of the CAISO controlled grid. The CAISO controlled grid is obligated to provide services to all transmission users. Specifically, the SCE transmission system is obligated to provide access to any load including the load that is originally served by the SDG&E transmission system.

3) Furthermore, no matter how or whether SDG&E's SOC load is interconnected to SDG&E's transmission system or to SCE's transmission system, the SOC load will be charged the same uniform transmission access charge.

4) After the shutdown of the San Onofre Nuclear Generation Station (SONGS), approximately 2,150 MW[21] of generation disappeared and the same amount of power flow disappeared on Path 43 and Path 44. So the electric pathways of Path 43 and Path 44 must be very relaxed at this time. The SOC load is now interconnected to Path 44 which is in the SDG&E service territory. With the SCE interconnection alternatives, part of the load will be disconnected from Path 44 and interconnected to Path 43, which is in the SCE service territory. Since the amount of load shifting between the SDG&E transmission system and SCE transmission system is small compared to the disappearance of the 2,150 MW generations from SONGS, there should be no technical issues. Since there are no economic or technical constraints for this interconnection, there is no reason for the SCE's transmission systems to take years to integrate part of the SOC load.

One of the goals of California's electric power deregulation was to remove barriers for the transmission open access. To the extent that interconnecting SDG&E's SOC load to SCE's transmission system is economical, it should be encouraged. The administrative border between SDG&E and SCE service territories should not be a barrier to economically utilizing the existing transmission facilities.

---

[21] SCE Application 13-04-001, ERRA Review of Operations 2012 Chapter XVII at 6.

Second, SDG&E also raised several technical concerns regarding interconnecting its SOC load into the SCE system.[22] ORA addresses SDG&E's technical concerns as follows:

1) The Talega Substation already has existing voltage support/reactive compensation. The CAISO also approved the South Orange County Dynamic Reactive Support [23]and 450 MVAR of reactive compensation at San Luis Rey Substation in its 2013-2014 transmission plan.[24] With these CAISO's approved-projects, there should be sufficient voltage support in the SOC area. Therefore, there is no reason for SDG&E to be concerned with voltage issues when part of the SOC load is interconnected to the SCE transmission system.

2) With ORA's proposal to divide the SOC load into two parts, it addresses the asserted loop flow issues in the SOC area. In addition, the four transmission lines making up Path 43 have a total power transfer capability of approximately 4800 MW, [25] while the SOC load is only approximately 443.3 MW, [26] which is less than 10% of the total power transfer capability of Path 43. When SONGS was operational, the power flow on Path 43 and Path 44 was significant, but with the shutdown of SONGS, the power flow on Path 43 and Path 44 has been significantly decreased under normal conditions. Path 43 and Path 44 are now being used mainly as transmission reserves for extreme contingencies. So the impact of shifting part of the SOC load to SCE's transmission system is minimal, especially when compared with the shutdown of SONGS. Furthermore, the impact of SOC area load shifting will be less the power flow of Path 45 and Path 49. Therefore it can be concluded that re-rating Path 45 and Path 49 transmission lines will be unnecessary.

---

[22] SDG&E Supplemental Testimony at 107-110.

[23] CAISO 2013-2014 Transmission Plan at page 285.

[24] CAISO 2013-2014 Transmission Plan at 288.

[25] SDG&E Supplemental Prepared Testimony at 106.

[26] SDG&E Supplemental Prepared Testimony at 55, Table 2-1.

Q.16. Given your evaluation of SDG&E's and ORA's proposed project alternatives, what are your conclusions?

A.16. After the electric power industry deregulation in California, the utilities invested billions of dollars in transmission assets and earned very high return on those investments. As a result, ratepayers experienced significant increases in transmission access charges (see Figure 5 below), in addition to the cost impact from the energy crisis. According to the CAISO tariff, the high voltage transmission access charges are paid for by all of California's ratepayers.[27] As shown in Figure 5 below, PG&E's ratepayers have experienced a seven fold increase in high voltage transmission access charges from 2001 to 2015. Therefore, it is critical to carefully examine each transmission project proposal for need and economic reasonableness to contain the ever increasing transmission cost impact on California ratepayers.

[27] CAISO Tariff.

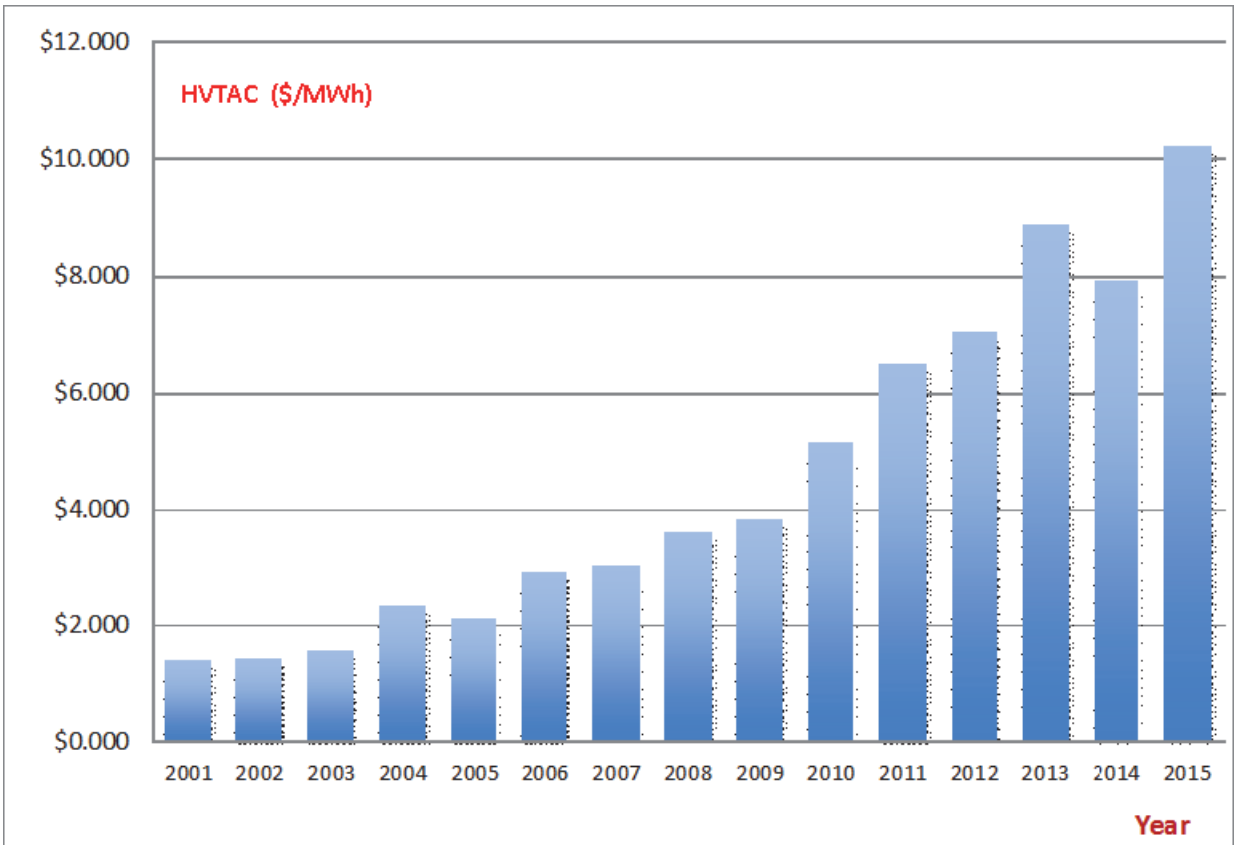


Figure 5: PG&E Area and CAISO-wide HV TAC ($/MWh) During 2001-2015

From the ratepayers' perspective, the power transfer capability of Path 43 and Path 44 is not used and useful most of the time due to the shutdown of SONGS. ORA recommends SDG&E be required to increase the usage of the unused power transfer capabilities in these transmission paths in order to mitigate inefficient use of ratepayer money and to not spend additional money on SDG&E's Proposed Project.

SDG&E's Proposed Project does not consider the full utilization of existing transmission capacities in the SOC area or the contiguous unused transmission facilities in SCE's service area. Instead, SDG&E proposes to build more new transmission assets in its own service territory. SDG&E's Proposed Project is inefficient and is not an effective or economical solution toward fixing the Talega Substation reliability problems and providing a second power supply source to the SOC area. Therefore, the Commission should reject SDG&E's Proposed Project.

ORA recommends that the Commission deny SDG&E's Proposed Project with prejudice. Otherwise, the Commission should consider one of ORA's proposed alternative projects.

APPENDIX A
QUALIFICATIONS OF WITNESSES

QUALIFICATIONS AND PREPARED TESTIMONY

OF

CHARLES MEE, P.E.

Q.1. Please state your name and business address.

A.1. My name is Charles Mee and my business address is 505 Van Ness Avenue, San Francisco, California 94102

Q.2. By whom are you employed and in what capacity?

A.2. I am employed by the Office of Ratepayer Advocates (ORA) of the California Public Utilities Commission as a Senior Utilities Engineer -- Specialist.

Q.3. Please describe your educational and professional experience.

A.3. In 1984, I graduated from Tsinghua University in Beijing, China with a Bachelor of Science degree in Electric Power Engineering.

From 1984 to 1998, I worked for Henan Electric Power Test and Research Institute in Henan Province, China in the capacity of Assistant Electric Power Engineer and performed the following tasks:

- Conducted technical research on electrical power equipment such as: transformers circuit breakers, transmission lines, and insulators for their electrical and characteristics and insulation levels.
- Measured operational over-voltages of the Henan Province electric power grid and developed recommendations on how to mitigate the over-voltages.

From 1988 to 1992, I worked for Hainan Province Electric Power Company in Hainan Province, China in the capacity of Electric Power Engineer and performed the following tasks:

- Monitored insulation level of high voltage generators, transformers, and circuit breakers. Monitored operational over-voltages of the high voltage equipment and the electric power grid.
- Supervised testing of power devices including generators, transmission lines, transformers, and circuit breakers.
- Drafted testing plans and testing reports.
- Coordinated with colleagues on the operation and maintenance of the power transmission and power generation facilities.
- Coordinated with colleagues on the planning, budgeting, engineering, constructing, and commissioning of new generators, power transmission lines, and power substations.

From 2002 to 2010, I worked for California Department of Water Resources in Sacramento, California in the capacity of Associate Hydroelectric Power Utility Engineer

and Senior Hydroelectric Power Utility Engineer (Supervisor), and performed the following duties:

- Participated in the CAISO stakeholder processes including planning, designing, and implementing Market Redesign and Technology Upgrade (MRTU). Collaborated on issues such as day ahead and real time energy markets, ancillary services markets, unit commitment, congestion management, locational marginal prices, market power mitigation, grid reliability, resource adequacy, and demand response.
- Participated in the CAISO stakeholder processes to solve issues in transmission planning, generator interconnection, local capacity studies, transmission rates, and grid management charges.
- Intervened into transmission owners' tariff filings on transmission access charges, transmission contracts rates, and reliability services rates.
- Conducted studies including special protection scheme, power and transmission contracts cost benefit analysis; transmission cost forecasting; transmission and interconnection planning; State Water Project (SWP) facility capabilities in providing ancillary services to the CAISO market; SWP resource modeling; market transactions reporting and reconciliation; and cost impact of stakeholder proposals to SWP power operations.
- From November 2010 to February 2013, I worked for the Energy Division of the California Public Utilities Commission, in San Francisco, California, as a Senior Utilities Engineer Specialist, and performed the following tasks:
- Facilitated settlement on distributed resources interconnection to utilities' distribution systems.
- Commented on the CAISO power market refinement including renewable resources integration and market power mitigation.
- Drafted resolution on utilities' transmission project advice letters and tariff amendments to assess charges for station power services.

Q.4. What is the purpose of this testimony?

A.4. I am the sponsor of ORA's Prepared Testimony in the South Orange County Reliability Enhancement Project, under docket number A. 12-05-020.

Q.5. Does this complete your testimony?

A.5. Yes, it does.