Southern California Edison
Presidential Substation Project A.08-12-023

DATA REQUEST SET Presidential ED-08

To: ENERGY DIVISION
Prepared by: Saeed Sadeghi
Title: Project Engineer
Dated: 03/19/2012

Question 01:

. Provide substation single line drawings and substation layout diagrams for the following substations:

- Royal
- Potrero
- Thousand Oaks
- Presidential

Response to Question 01:

Please see the attached files for the Single Line Diagrams and Plot Plans for Royal Substation, Potrero Substation, Thousand Oaks Substation, and the proposed Presidential Substation**.**

THIS DATA REQUEST CONTAINS PROTECTED MATERIAL - CONTAINS CRITICAL ENERGY INFRASTRUCTURE INFORMATION.

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To: ENERGY DIVISION
Prepared by: Scott Smith
Title: Support Engineering Manager
Dated: 03/19/2012

Question 02:

Provide subtransmission and distribution conductor rating data associated with each of the above noted substations in Item 1.

Response to Question 02:

Please refer to the enclosed attachment.

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To: ENERGY DIVISION
Prepared by: Scott Smith
Title: Support Engineering Manager
Dated: 03/19/2012

Question 03:

Please confirm (or correct) the following transformer ratings parameters as they apply to the current SCE standard 66/16 kV transformer.

- Base rating, 55 degree C rise, 15 MVA.
- Top nameplate rating, 65 degree C rise with one stage of fans, 28 MVA.
- PLL rating, 65 degree C rise with four stages of fans and low 5% impedance, 36.4 MVA (130% of Top nameplate rating).
- Emergency rating, 145% of Top nameplate rating, 40.6 MVA.

Response to Question 03:

Following is the rating for SCE's standard 66/16 kV Distribution Substation Transformer (actual nameplate voltage is 69-17.28 kV):

- **Base Rating (55C, OA): 15 MVA (530 Amps)**
  Note:
  1. OA stands for Open Air Cooling
  2. 55 C is the Temperature Rise

- **Top Rating (65C, FA/FA): 28 MVA (989 Amps)**
  Note:
  1. FA / FA stands for 2 stages of forced air cooling (fans)
  2. 65 C is the Temperature Rise

- **PLL Rating (130% of Top Rating): 36.4 MVA (1286 Amps)**

- **(N-1) Rating (145% of the Top Rating): 40.6 MVA (1435 Amps)**

Following is the rating for SCE's standard 66/16 kV Distribution Substation Transformer Bank (actual nameplate voltage is 69-17.28 kV): (Which is

composed of 2 - 15 MVA transformers operated in parallel).

- **Base Rating (55C, OA): 30 MVA (1060 Amps)**

  Note:

  1. OA stands for Open Air Cooling
  2. 55 C is the Temperature Rise

- **Top Rating (65C, FA/FA): 56 MVA (1978 Amps)**

  Note:

  1. FA / FA stands for 2 stages of forced air cooling (fans)
  2. 65 C is the Temperature Rise

- **PLL Rating (130% of Top Rating): 72.8 MVA (2572 Amps)**

- **(N-1) Rating (145% of the Top Rating): 81.2 MVA (2870 Amps)**

Note: The nominal impedance of our standard Distribution Substation Transformer is 7% based on:

- MVA Base Rating of 15
- Primary Winding Voltage of 69 kV
- Secondary Winding Voltage of 17.28 kV

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To: ENERGY DIVISION
Prepared by: Jack Haggenmiller
Title: Field Engineering Project Manager
Dated: 03/19/2012

Question 04:

Describe the criteria used to determine which substations were included in the ENA versus which substations providing load (as described in the revised load forecast) into the proposed Presidential Substation Project were not included in the ENA (Santa Susana, Newbury, Oak Park).

Response to Question 04:

To understand how SCE defined the Electrical Needs Area, one must first understand what circumstances drive the need for a project. An action plan is typically identified when a constraint on the electrical distribution system is identified. In the case of this project, it was originally observed that the last transformer bank capacity increase project at Thousand Oaks Substation in 2008 built the substation out to its capacity limit. Future growth needs within the sphere of influence of Thousand Oaks Substation would need to be served from the surrounding substations. During this review, it was noticed that while Royal Substation and Potrero Substation are not yet completely built-out, they are both within one small capacity increase project of being completely built-out. Thus, an area was identified where three contiguous substations were either at or near their ultimate capacity. The location where customers are no longer being served from Thousand Oaks Substation, Royal Substation, and Potrero Substation was defined as the outer boundary of the Electrical Needs Area. That is, the Electrical Needs Area is defined by the outer limits of the distribution circuits emanating from Thousand Oaks Substation, Royal Substation, and Potrero Substation.

In regards as to why the neighboring Newbury Substation, Oak Park Substation, and Santa Susana Substation were not included in the Electrical Needs Area, Newbury Substation has the potential capability of having an additional 11.2 MVA of nameplate capacity added before it will reach its ultimate build-out of 112 MVA of nameplate capacity. However, upgrading Newbury Substation would not provide any direct capacity relief to the Electrical Needs Area. Oak Park Substation and Santa Susana Substation are substations where future capacity upgrades are impractical due to the existing limited footprint of each substation. While Oak Park could provide some capacity relief to Thousand Oaks and Potrero Substations, it is too far away to provide effective capacity relief to Royal Substation. Santa Susana Substation has the potential capability of having an additional 8 MVA of nameplate capacity before it reaches its ultimate

build-out of 112 MVA of nameplate capacity. Likewise, Santa Susana Substation could also provide some limited capacity relief to Royal Substation, but it is too far away from Thousand Oaks Substation and Potrero Substation. By placing the new capacity in a central location within the Electrical Needs Area, the new capacity can be effectively tapped into and significant load relief provided to all of these substations so that SCE can continue to provide safe and reliable electrical service to its customers.

As discussed in PEA Section 2.1.3, although the upgrade of Royal Substation and Potrero Substation would provide direct capacity relief to the Electrical Needs Area, following these upgrades, there would be no remaining options for increasing capacity at any of the Electrical Needs Area Substations. Therefore, as also discussed within PEA Section 2.13, these substations upgrades would only delay, but not eliminate, the need for a new substation in the Electrical Needs Area. Including the upgrades of Santa Susana Substation and Newbury Substation to their ultimate 112 MVA in addition to building Royal Substation and Potrero Substation to their ultimate 112 MVA nameplate capacity would provide sufficient capacity in the Electrical Needs Area to meet the 10 year Peak Demand Forecast, but would unfortunately result in a situation where five adjacent substations (Santa Susana Substation, Royal Substation, Thousand Oaks Substation, Potrero Substation, and Newbury Substation) would all be operating at their 112 MVA ultimate build-out capacity.

SCE is concerned with the potential reduced reliability and operational flexibility associated with building-out multiple adjacent substations with high utilization rates in a localized area during peak conditions. In addition, because SCE is obligated to serve all existing and new customers within its service territory, SCE is concerned that if a new large 5-10 MVA customer were to apply for service in this area that SCE may not be able to serve the customer in a timely manner because of the lack of available capacity.

The SCE grid is interconnected and benefits of a proposed project are not necessarily constrained by the Electrical Needs Area boundary. Trying to analyze a large regional Electrical Needs Area with multiple substations is significantly more difficult than analyzing a single substation Electrical Needs Area. Problems associated with a large regional Electrical Needs Area with multiple substations would potentially show such an Electrical Needs Area as a whole having sufficient capacity. However, this approach would lose sight of the more localized constraints, such as when the first substation reaches it Maximum Operating Limit, which could be years before the entire reserve capacity of a larger regional Electrical Needs Area reached its capacity. Therefore, SCE proposes an Electrical Needs Area to address the more localized need and system constraints which would otherwise be "lost in the shuffle" in a broader more generic Electrical Needs Area.

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Question 05:

If an alternative was developed to address only the forecast load growth generated from within the ENA, describe the load impacts on those substations outside the ENA (Santa Susana, Newbury, Oak Park), which have been identified under the revised load forecast as rolling significant load into the Proposed Presidential Substation. This alternative would assume that there would not be capacity within the ENA substations to accommodate load rolling from outside the ENA.

Response to Question 05:

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CRITICAL ENERGY INFRASTRUCTURE INFORMATION.

Please see the attached file containing the analysis that addresses a criteria high case 2012 - 2021 Peak Demand Forecast where load growth is only generated from within the Electrical Needs Area. If no load were to be transferred into the Presidential Substation Project Electrical Needs Area, the following substations are forecasted to reach their Maximum Operating Limits in the following years as provided below. Please note that the 95% Maximum Operating Limits would be reached sooner than the dates provided below and therefore SCE may need to develop projects to address the capacity exceedences earlier than the dates specified. However, in the interest of providing a response in a timely manner, SCE is providing the figures below, which are consistent with what SCE provided in its February 2012 Rebuttal Testimony. The 95% Maximum Operating Limits figures can be provided if needed by the CPUC.

Oak Park Substation	102.8% in 2018
Newbury Substation	100.3% in 2019
Royal Substation	103.2% in 2020 (This assumes that the mitigation bank capacity increase occurs in 2015.)
Thousand Oaks Substation	100.5% in 2020
Santa Susana Substation	100.3% in 2020

Although not specifically requested, the following substation is also forecasted to reach its

Maximum Operating Limit in the following year:

Malibu Substation	101.3% in 2018

In addition, seven new 16 kV distribution circuits would be required as indicated on the attached Substation Status Sheets.

Under this scenario, SCE would have six substations over their capacities by 2020 and would require appropriate projects to mitigate the capacity deficiencies. The Presidential Substation would not only address the need for additional capacity in the Electrical Needs Area, but would also be a major contributor to resolving the deficiencies above.