

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

DATA REQUEST SET Presidential ED-10

To: ENERGY DIVISION
Prepared by: Jack Haggemiller
Title: Field Engineering Project Manager
Dated: 09/20/2012

Question 01:

Southern California Edison (SCE) in response to data inquiries has noted that the implementation of a System Alternative A (per its most recent iteration as described below) would require SCE to take other actions external to the ENA to meet the projected 2021 loads. To more fully understand and assess the impacts of the proposed System Alternative A (see the proposed description of this alternative below), the following data is requested. In replying to the questions please assume that Alternative A is implemented and the rolling of load into the ENA would be limited by the capacities of the ENA substations (Royal, Thousand Oaks, and Potrero) following the completion of all identified upgrades. The CPUC would not impose operational load rolling restrictions under this alternative.

System Alternative A – Upgrade Existing Substations Using Standard SCE Equipment and Transformers

Description

Increase capacity at two of the existing ENA Substations: Upgrade Potrero Substation and Royal Substation by replacing the existing transformers and 16 kV station capacitor banks with higher capacity equipment, and adding additional 16 kV circuits. The Thousand Oaks Substation is not capable of supporting an upgrade. The upgrades would consist of:

Potrero Substation Upgrades

- Replace two 22.4 MVA transformers with two 28 MVA transformers;
- The upgrade of two 3 MVAR 16 kV station capacitor banks to two 4.8 MVAR 16 kV station capacitor banks;
- Upgrade the existing transformer breakers and leads (work internal at the substation); and
- Install one new 16 kV circuit approximately 1-mile long.

Royal Substation

- Replace one 22.4 MVA transformer with a 28 MVA transformer;
- Replace and relocate two 16 kV capacitor banks (4.8 and 6.0 MVAR) with three new 4.8 MVAR 16 kV capacitor banks;
- Extend the 16 kV operating and transfer buses and rack; and

- Install two new 16 kV circuits approximately 6.5 miles long.

What additional upgrades would be required outside the ENA at the following substations:

- a. Newbury, (Note: the SCE 2/6/12 rebuttal from Alicia Lopez, indicated that 11.2MVA could be added to the substation although there may be potential issues with circuit ties.) Please describe the nature of any problems associated with the circuit ties.
- b. Oak Park, and (Note: the SCE 2/6/12 rebuttal from Alicia Lopez, indicated that an additional 28 MVA transformer and / or the two existing 14 MVA transformers could be replaced with 28 MVA units, again although there may be limitations with circuits and other infrastructure.) Please describe the nature of any problems associated with the circuits or other infrastructure. Would one be correct in assuming the 28 MVA transformers would carry a PLL rating of approximately 36.4 MVA?
- c. Santa Susana. (Note: no indications were given in the SCE 2/6/12 rebuttal from Alicia Lopez, as to whether or not upgrades are possible at this substation.)

Response to Question 01:

Using the 2012 - 2021 Peak Demand Forecast, the scenario that both 1) System Alternative A – Upgrade Existing Potrero and Royal Substations Using Standard SCE Equipment and Transformers and SCE standard design (in 2015) and 2) being able to roll load in accordance with existing SCE practices are implemented. Please note each of the answers below is based on only a desktop analysis and neither a job walk analysis nor engineering has been completed to detail all necessary work elements:

a. SCE would not need to upgrade the transformers at Newbury Substation, but would require an additional distribution circuit in 2016 under the scenario in this Data Request #10. Today, there are two sets of circuits that tie to each other between Thousand Oaks Substation and Newbury Substation. However, these four circuits are currently loaded considerably higher than the average circuit loading, which restrict SCE's ability to roll load between Thousand Oaks Substation and Newbury Substation. The aforementioned new distribution circuit could provide the ability to roll additional amounts of load when needed beginning in 2016.

b. The typical PLL of a 28 MVA nameplate rated transformer with a heat run study would be 36.4 MVA. If banked with another 28 MVA nameplate rated transformer with a heat run study of the same impedance and no other limiting factors, then that transformer would also be rated at 36.4 MVA. A new 16 kV distribution circuit* would be needed at Oak Park Substation in 2016, and a bank increase project including additional 16 kV capacitors would be needed in 2017. Additional 16 kV circuits would also be needed in 2019 and 2020. The current footprint of the existing substation does not allow for the installation of the wrap-a-round bus without removing trees, grading, and expanding the wall/fence of the substation. The three new 16 kV distribution circuits would require extensive civil work.

Oak Park Substation Bank Increase

Install new 28 MVA transformer.

Install second 16 kV operating bus.

Install new 4800 kVAR capacitor (CAP) bank.

Replace one circuit breaker (CB) with a larger CB.

c. There is a small transformer capacity increase possible at Santa Susana Substation that could allow for an additional approximately 8 MVA of additional capacity, building Santa Susana Substation out to its ultimate 112 MVA nameplate rating. This bank increase would be needed in 2018. An additional 16 kV distribution circuit would also be needed in 2020. However, construction of this circuit in a manner that meets SCE's standards may not be feasible due to the space limitations between the substation and an existing flood control channel which may limit the ability to construct new distribution circuits.

Santa Susana Substation Bank Increase

Replace two transformers with two (2) 28 MVA transformers at Transformer Bank.

Replace other limiting components as needed.

Replace two CAP banks with two larger CAP banks.

Replace six circuit breakers (CB) with larger CBs.

Despite these upgrades and the upgrades needed to fully play out this scenario addressed in Questions 4 and 5, Royal Substation is still forecasted to exceed its Planned Loading Limit in 2021. Therefore Presidential Substation would be needed within SCE's ten year planning horizon in 2021.

*Denotes work already identified in SCE's 2012 – 2021 DSP Peak Demand Forecast but needed in the ten year planning horizon for this System Alternative A scenario (including the additional work identified in this data request set) as well.

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

DATA REQUEST SET Presidential ED-10

To: ENERGY DIVISION

Prepared by: Jack Haggemiller and Saeed Sadeghi

Title: Project Manager and Project Engineer

Dated: 09/20/2012

Question 02:

Southern California Edison (SCE) in response to data inquiries has noted that the implementation of a System Alternative A (per its most recent iteration as described below) would require SCE to take other actions external to the ENA to meet the projected 2021 loads. To more fully understand and assess the impacts of the proposed System Alternative A (see the proposed description of this alternative below), the following data is requested. In replying to the questions please assume that Alternative A is implemented and the rolling of load into the ENA would be limited by the capacities of the ENA substations (Royal, Thousand Oaks, and Potrero) following the completion of all identified upgrades. The CPUC would not impose operational load rolling restrictions under this alternative.

System Alternative A – Upgrade Existing Substations Using Standard SCE Equipment and Transformers

Description

Increase capacity at two of the existing ENA Substations: Upgrade Potrero Substation and Royal Substation by replacing the existing transformers and 16 kV station capacitor banks with higher capacity equipment, and adding additional 16 kV circuits. The Thousand Oaks Substation is not capable of supporting an upgrade. The upgrades would consist of:

Potrero Substation Upgrades

- Replace two 22.4 MVA transformers with two 28 MVA transformers;
- The upgrade of two 3 MVAR 16 kV station capacitor banks to two 4.8 MVAR 16 kV station capacitor banks;
- Upgrade the existing transformer breakers and leads (work internal at the substation); and
- Install one new 16 kV circuit approximately 1-mile long.

Royal Substation

- Replace one 22.4 MVA transformer with a 28 MVA transformer;
- Replace and relocate two 16 kV capacitor banks (4.8 and 6.0 MVAR) with three new 4.8 MVAR 16 kV capacitor banks;
- Extend the 16 kV operating and transfer buses and rack; and

- Install two new 16 kV circuits approximately 6.5 miles long.

What additional external capacity (Top rating and PLL) would be achieved as a result of these substation upgrades outside the ENA?

Response to Question 02:

With the above mentioned bank increases specified in Question 1 (which stated additional substation upgrades would not be required at Newbury Substation), Oak Park Substation and Santa Susana Substation (which are external to the ENA) would have the following top rating (nameplate) and anticipated PLL ratings:

Oak Park Substation: 84 MVA top nameplate rating and an estimated 109.2 MVA PLL

Santa Susana Substation: 112 MVA top nameplate rating and an estimated 145.6 MVA PLL

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

DATA REQUEST SET Presidential ED-10

To: ENERGY DIVISION
Prepared by: Thomas Botello
Title: Grid Control Manager
Dated: 09/20/2012

Question 03:

Southern California Edison (SCE) in response to data inquiries has noted that the implementation of a System Alternative A (per its most recent iteration as described below) would require SCE to take other actions external to the ENA to meet the projected 2021 loads. To more fully understand and assess the impacts of the proposed System Alternative A (see the proposed description of this alternative below), the following data is requested. In replying to the questions please assume that Alternative A is implemented and the rolling of load into the ENA would be limited by the capacities of the ENA substations (Royal, Thousand Oaks, and Potrero) following the completion of all identified upgrades. The CPUC would not impose operational load rolling restrictions under this alternative.

System Alternative A – Upgrade Existing Substations Using Standard SCE Equipment and Transformers

Description

Increase capacity at two of the existing ENA Substations: Upgrade Potrero Substation and Royal Substation by replacing the existing transformers and 16 kV station capacitor banks with higher capacity equipment, and adding additional 16 kV circuits. The Thousand Oaks Substation is not capable of supporting an upgrade. The upgrades would consist of:

Potrero Substation Upgrades

- Replace two 22.4 MVA transformers with two 28 MVA transformers;
- The upgrade of two 3 MVAR 16 kV station capacitor banks to two 4.8 MVAR 16 kV station capacitor banks;
- Upgrade the existing transformer breakers and leads (work internal at the substation); and
- Install one new 16 kV circuit approximately 1-mile long.

Royal Substation

- Replace one 22.4 MVA transformer with a 28 MVA transformer;
- Replace and relocate two 16 kV capacitor banks (4.8 and 6.0 MVAR) with three new 4.8 MVAR 16 kV capacitor banks;
- Extend the 16 kV operating and transfer buses and rack; and

- Install two new 16 kV circuits approximately 6.5 miles long.

Describe how these combined upgrades would affect the operational flexibility of the SCE system within and external to the ENA. What are likely operational constraints and limitations, etc.?

Response to Question 03:

The operating constraints or limitations associated with System Alternative A increase as the need for Presidential Substation in 2021 draws closer. While System Alternative A and the additional work identified in this data request provide additional transformer capacity and additional circuits, Santa Susana Substation, Royal Substation, Thousand Oaks Substation, and Potrero Substation would be built to their ultimate capacities. If Presidential Substation is not constructed and load continues to grow, by 2021, Royal Substation would be loaded to its ultimate capacity, creating increased risk of load dropping for the loss of any transformer. Circuit restoration for unplanned outages would also be limited because of the lack of adjacent substation capacity. Lastly, the introduction of any unanticipated new large customers not accounted for in SCE's forecast would then result in either the need to accelerate the construction of Presidential Substation, the creation of some other project (e.g. new substation or subtransmission line), or a situation where SCE may fail to meet its obligation to serve a new customer in a timely manner.

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

DATA REQUEST SET Presidential ED-10

To: ENERGY DIVISION
Prepared by: Jack Haggemiller
Title: Field Engineering Project Manager
Dated: 09/20/2012

Question 04:

Southern California Edison (SCE) in response to data inquiries has noted that the implementation of a System Alternative A (per its most recent iteration as described below) would require SCE to take other actions external to the ENA to meet the projected 2021 loads. To more fully understand and assess the impacts of the proposed System Alternative A (see the proposed description of this alternative below), the following data is requested. In replying to the questions please assume that Alternative A is implemented and the rolling of load into the ENA would be limited by the capacities of the ENA substations (Royal, Thousand Oaks, and Potrero) following the completion of all identified upgrades. The CPUC would not impose operational load rolling restrictions under this alternative.

System Alternative A – Upgrade Existing Substations Using Standard SCE Equipment and Transformers

Description

Increase capacity at two of the existing ENA Substations: Upgrade Potrero Substation and Royal Substation by replacing the existing transformers and 16 kV station capacitor banks with higher capacity equipment, and adding additional 16 kV circuits. The Thousand Oaks Substation is not capable of supporting an upgrade. The upgrades would consist of:

Potrero Substation Upgrades

- Replace two 22.4 MVA transformers with two 28 MVA transformers;
- The upgrade of two 3 MVAR 16 kV station capacitor banks to two 4.8 MVAR 16 kV station capacitor banks;
- Upgrade the existing transformer breakers and leads (work internal at the substation); and
- Install one new 16 kV circuit approximately 1-mile long.

Royal Substation

- Replace one 22.4 MVA transformer with a 28 MVA transformer;
- Replace and relocate two 16 kV capacitor banks (4.8 and 6.0 MVAR) with three new 4.8 MVAR 16 kV capacitor banks;
- Extend the 16 kV operating and transfer buses and rack; and

- Install two new 16 kV circuits approximately 6.5 miles long.

Would new 66 kV line(s) be required to serve any of these substations? If additional 66 kV line(s) is/are needed, what would the conceptual beginning, endpoint, and route(s) be?

Response to Question 04:

This response answers the question using the 2012 - 2021 Peak Demand Forecast data and assumes a scenario in which 1) System Alternative A – Upgrades existing Potrero and Royal Substations using standard SCE design and equipment – would be constructed, 2) SCE is able to roll load in accordance with existing SCE practices, and 3) the scope of work identified in Questions 1 and 5 of this Data Request are constructed. For purposes of this analysis, SCE has assumed that all projects within the current 2012 - 2021 DSP Peak Demand Forecast and the 2012 - 2021 Transmission Substation Plan with need dates identified before 2015 (when System Alternative A would be constructed) would be implemented. Under this scenario, the following additional 66 kV subtransmission line work would be needed:

- 1) Reconductor the existing Potrero Substation to Thousand Oaks Substation leg of the existing Moorpark-Potrero-Thousand Oaks 66 kV Subtransmission Line in 2019. The portion of the existing 66 kV subtransmission line that would be reconducted is approximately 4 miles. The line route passes Thousand Oaks Substation, proceeds east on Wilbur Road, south on Holdencamp Road, east along existing SCE facilities and ultimately along Hillcrest Drive and into Potrero Substation.
- 2) Reconductor a portion of the existing Moorpark – Royal No. 2 66 kV Subtransmission Line in 2020. The portion is located along First Street from Los Angeles Avenue to Royal Substation and is approximately 3,000 feet in length.
- 3) Construct the new Moorpark – Valdez 66 kV Subtransmission Line from Moorpark Substation to Valdez Substation in 2020. SCE would likely propose this new 66 kV subtransmission line to follow the route of the existing Moorpark – Royal 66 kV No. 1 Subtransmission Line from Moorpark Substation to Royal Substation approximately 8.5 miles, install new conductor and facilities or reuse idle conductor along the portion of the existing Moorpark – Royal No. 2 66 kV Subtransmission Line from Royal Substation to Royal Avenue approximately 1 mile, and then follow the existing Moorpark – Shellline – Valdez 66 kV Subtransmission Line approximately 16 miles from Royal Avenue to Valdez Substation.

This new 66 kV subtransmission line would leave Moorpark Substation, travel north on Gabbert Road, east on Poindexter Road, north near Moorpark Road, east near Charles Street, and follow the north side of SR-118, and somewhat follow Los Angeles Avenue southeast until Cochran Street where it would proceed east to Royal Substation. As the new 66 kV subtransmission line passed Royal Substation, it would proceed south on First Street until Royal Avenue, and then east on Royal Avenue until reaching the existing SCE right of way. From this location, the 66 kV subtransmission line would proceed southeast to SR-101 where it would proceed east on the south side of the freeway near Calabasas Road. The 66 kV subtransmission line would continue proceeding southeast after crossing Park Granada, and follow the path between Park Sorrento and Valmar Road until reaching Valdez Substation.

Despite these upgrades and the upgrades needed to fully play out this scenario addressed in Questions 1 and 5, Royal Substation is still forecasted to exceed its Planned Loading Limit in 2021. Therefore, Presidential Substation would be needed within SCE's ten year planning horizon in 2021.

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

DATA REQUEST SET Presidential ED-10

To: ENERGY DIVISION
Prepared by: Jack Haggemiller
Title: Field Engineering Project Manager
Dated: 09/20/2012

Question 05:

Southern California Edison (SCE) in response to data inquiries has noted that the implementation of a System Alternative A (per its most recent iteration as described below) would require SCE to take other actions external to the ENA to meet the projected 2021 loads. To more fully understand and assess the impacts of the proposed System Alternative A (see the proposed description of this alternative below), the following data is requested. In replying to the questions please assume that Alternative A is implemented and the rolling of load into the ENA would be limited by the capacities of the ENA substations (Royal, Thousand Oaks, and Potrero) following the completion of all identified upgrades. The CPUC would not impose operational load rolling restrictions under this alternative.

System Alternative A – Upgrade Existing Substations Using Standard SCE Equipment and Transformers

Description

Increase capacity at two of the existing ENA Substations: Upgrade Potrero Substation and Royal Substation by replacing the existing transformers and 16 kV station capacitor banks with higher capacity equipment, and adding additional 16 kV circuits. The Thousand Oaks Substation is not capable of supporting an upgrade. The upgrades would consist of:

Potrero Substation Upgrades

- Replace two 22.4 MVA transformers with two 28 MVA transformers;
- The upgrade of two 3 MVAR 16 kV station capacitor banks to two 4.8 MVAR 16 kV station capacitor banks;
- Upgrade the existing transformer breakers and leads (work internal at the substation); and
- Install one new 16 kV circuit approximately 1-mile long.

Royal Substation

- Replace one 22.4 MVA transformer with a 28 MVA transformer;
- Replace and relocate two 16 kV capacitor banks (4.8 and 6.0 MVAR) with three new 4.8 MVAR 16 kV capacitor banks;
- Extend the 16 kV operating and transfer buses and rack; and

- Install two new 16 kV circuits approximately 6.5 miles long.

In addition to those described in items 1-4 above, what other upgrades external the ENA may be needed under an implementation of System Alternative A scenario?

Response to Question 05:

This response answers the question using the 2012 - 2021 Peak Demand Forecast data and assumes a scenario in which 1) System Alternative A – upgrade existing Potrero and Royal Substations using standard SCE design and equipment is constructed, 2) SCE is able to roll load in accordance with existing SCE practices, and 3) the scope of work identified in Questions 1 and 4 of this Data Request are constructed. For purposes of this analysis, SCE has assumed that all projects within the current 2012 - 2021 DSP Peak Demand Forecast and the 2012 - 2021 Transmission Substation Plan with need dates identified before 2015 (when System Alternative A would be constructed) would be implemented. Under this scenario, the following additional work would be needed:

- 1) A new 16 kV distribution circuit would be needed emanating from Chatsworth Substation in 2020
- 2) A bank upgrade project* would be needed at Malibu Substation in 2017 to add a new 28 MVA transformer, capacitor bank, and second 16 kV operating bus. A new 16 kV distribution circuit would also be needed in 2021.
- 3) A new 16 kV distribution circuit* would be needed emanating from Moorpark Substation in 2020.
- 4) A new 16 kV distribution circuit* would be needed emanating from Tapia Substation in 2017.
- 5) A new 16 kV distribution circuit* would be needed emanating from Thousand Oaks Substation in 2016.
- 6) A new 16 kV distribution circuit* would be needed emanating from Valdez Substation in 2016.

In addition, in order to complete the proposed Moorpark - Valdez 66 kV Subtransmission Line in 2020 as identified under this scenario, three 16 kV distribution circuits out of Valdez Substation would need to have existing sections of line rearranged. These include approximately 3/4 mile of existing overhead vertical configuration circuit rebuilt to horizontal configuration circuit along the south side of the Ventura Freeway (SR-101) approximately west of Ramada Boulevard extended on one circuit. In addition, approximately 1.5 miles of existing overhead horizontal configuration circuit would be needed to be rearranged as vertical configuration circuit along Calabasas Road from approximately Parkway Calabasas to approximately Crummer Ranch Road on a second circuit. On a third circuit, approximately 1 mile of existing overhead vertical configuration circuit would need to be rearranged as horizontal configuration, and approximately 1.5 miles of existing overhead vertical configuration circuit would need to be converted to horizontal configuration, and approximately 3/4 miles of existing overhead vertical configuration would need to be converted to horizontal configuration between the Ventura Freeway (SR-101) and Calabasas Road from approximately Park Granada extended to approximately Las Virgenes

Road.

- 7) A new 66 kV capacitor would be required at Oak Park Substation in 2018.

Despite these upgrades and the upgrades needed to fully play out this scenario addressed in Questions 1 and 4, Royal Substation is still forecasted to exceed its Planned Loading Limit in 2021. Therefore, Presidential Substation would still be needed within SCE's ten year planning horizon in 2021.

*Denotes work already identified in SCE's 2012 – 2021 DSP Peak Demand Forecast but needed in the ten year planning horizon for this System Alternative A scenario (including the additional work identified in this data request set) as well.