STATE OF CALIFORNIA Edmund G. Brown Jr., Governor

PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
SAN FRANCISCO, CA 94102-3298

December 15, 2014

Ryan Stevenson
Regulatory Policy & Affairs
Southern California Edison
8631 Rush Street, General Office 4 - G10O
Rosemead, CA 91770

Re: Data Request #10 for the SCE West of Devers Upgrade Project - Application No. A.13-10-020

Dear Mr. Stevenson:

The California Public Utilities Commission's (CPUC) Energy Division has reviewed all of the documents and materials that SCE has provided, including the Application and Proponent's Environmental Assessment (PEA; dated October 25, 2013), the PEA deficiency response items submitted in late 2013 and early 2014, and SCE's data responses to date. During the analysis of the aforementioned materials, we have identified additional information items needed from SCE.

Attached please find a revised request for Data Request No. 10, question ALT-19 only. This request has been modified in response to our December 12, 2014 conference call. Revisions to the original Data Request 10, ALT-19 request are shown in **<u>underlined and bold text</u>**, and portions of the original request have been deleted (shown in ~~strikeout~~). Additional data requests may be necessary to address other CEQA or NEPA topics as we move forward with EIR/EIS preparation.

We would appreciate your prompt responses to these data requests, which will allow us to maintain our current schedule. Given our desire to maintain an aggressive schedule, we request that responses be provided to us within one week if possible (by December 22, 2014). If this is not possible, please provide me with an estimated response date for any information that can't be provided within a week.

Please submit one set of responses to me in both hard copy and electronic format and one to Susan Lee at Aspen Environmental Group in electronic format (unless there are hardcopy-only documents). Any questions on this data request should be directed to me at (415) 703-2068.

Sincerely,

Billie Blanchard

Billie Blanchard
Project Manager for West of Devers Upgrade Project
Energy Division CEQA Unit

Attachments (1)

cc: Mary Jo Borak, CPUC Supervisor CEQA Unit
Xiao Selena Huang, ORA
Cleveland Lee, Legal Division for ORA

Frank McMenimen, Bureau of Land Management
John Kalish, Bureau of Land Management
Lynette Elser, Bureau of Land Management
Susan Lee & Hedy Koczwara, Aspen Environmental Group
Nicholas Sher, CPUC Legal Division

SCE West of Devers Upgrade Project
Data Request No. 10

Background

West of Devers Upgrade Project Data Request No. 10 includes requests related to the potential alternatives that may be evaluated in the EIR/EIS. Most of these requests are follow-up requests, so each request references the original Data Request letter and item number that was sent to SCE.

Data Requests

ALT-17 **[No Change from 12/8/14] Follow-up to ALT-15 (Data Request No. 7, regarding potential Tower Relocation)**: SCE's response to ALT-15(a) stated the current locations of proposed towers "have been determined based on not only the need to reserve the largest possible amount of ROW available for future expansion, but also to be placed in locations that would allow for the most efficient and safe working environment for the construction of these new towers in close proximity to the existing lines that operate through that corridor."

(A) The response to ALT-15 states, "SCE anticipates that only single-line outages will be allowable by CAISO for extended periods to facilitate construction of the Proposed Project." Please identify the CAISO protocol that guides this situation.

(B) Please describe whether construction-related double-line outages would be allowed, for what durations they could be allowable, and under what circumstances.

(C) SCE's response to ALT-15 states "If the new tower lines were to be redesigned farther north, to allow for added separation from the southern edge of the ROW, the construction of the northern tower would impinge within the safe working distance away from the existing double-circuit tower line that runs along the north side of Segment 6 and the center of Segment 4. The construction efforts necessary for that tower placement would therefore be significantly extended, because SCE would have to initially build the new southern tower line, string those two new circuits, and then return to the same areas again to perform similar construction activities, such as foundation construction, tower assembly and erection and line stringing, for the second (northern) tower line." What would be the minimum safe working distance from the existing double-circuit tower during construction of the new towers?

(D) SCE's previous response stated that a 12 month delay would result from the need to redesign the project and establish a construction process that would allow the relocation of certain towers as anticipated in this configuration. Please describe the specific consequences of a 12 month delay. What known projects would be affected in terms of their deliverability?

ALT-18 **[No Change from 12/8/14] Follow-up to ALT-14 (Data Request No. 7, regarding the 2005 SCE Proposal for the WOD Upgrades)**: This request is follow-up to two statements in SCE's responses to ALT-14:

- SCE provided a response to a potential alternative in which the existing double-circuit 220 kV structures would be reconductored with double-bundled 1033.5 kcmil conductors and the new double-circuit structures would be strung with the proposed double-bundled 1590 kcmil conductors. SCE noted that such a potential alternative would be infeasible due to physical construction safety and operational hazards. SCE also stated that the double-bundled 1590 kcmil conductor that would satisfy the Project Objectives could not be supported by the existing double circuit 220 kV structures.

- SCE's response to ALT-14 states, "As was proposed in the 2005 project, the existing double-circuit towers as they are currently located in the field would only be able to support double-bundled 1033.5 kcmil ACSR as the maximum conductor size." Due to discussion at our October 2014 meeting about changes to SCE's wind loading criterion since 2005, we are uncertain as to whether this previous statement accurately represents SCE's position.

Please answer the following additional questions regarding the capabilities of the existing double-circuit structures.

(A) Please confirm that the existing double-circuit structures would currently support the following conductors, given the 18 pound-per-square-foot wind design condition:

- o Double-bundled 1033.5 kcmil ACSR, as in the 2005 SCE Proposal for the WOD Upgrades.
- o Single-conductor 1590 kcmil ACSR, not double-bundled per circuit.

If the existing structures would not support these conductors, please explain what modifications would be required to the existing structures to support these conductors conductor.

(B) After responding to part (A), please also specifically address the capacity of tangent structures, angle structures, and deadend structures. Address each structure type separately.

(C) Please provide a line sag and tension characteristics (Sag/Ten) table for each of the two conductor configurations listed above for spans representative of the existing double-circuit tower line.

ALT-19 **[Revised] Follow-up to ALT-4 (Data Request No. 5, regarding potential use of Aluminum Conductor Composite Reinforced [ACCR])**: SCE's response to ALT-4 provided the requested line sag and tension characteristics (Sag/Ten charts) for the "Drake 795"-sized ACSS and ACCR. We note that the response showed that the emergency-rating ampacity for these conductors is less than that of the proposed 1590 ACSR conductor. We recognize SCE's concerns about the potential reduced capacity of alternative technologies.

Background. High Temperature Low Sag (HTLS) options exist to the proposed 1590 ACSR conductors; these HTLS conductors are commercially available and need to be explored further for feasibility. HTLS conductors are a proven and accepted technology in the electric utility industry for upgrading capacity in existing corridors and on existing structures as well as for new line construction. Since HTLS conductors can normally operate at much higher temperatures it is possible to greatly increase power transfer capacity when compared to an equivalent ACSR type of conductor while maintaining clearances due to the low sag nature of HTLS conductors. For example ACCR conductor was first commercially installed in the United States in 2005 by Excel Energy and since that time it has been used domestically by multiple utilities such as Western Area Power

Administration, Arizona Public Service, Silicon Valley Power, Alabama Power and Platte River Authority at voltages up to 230 kV and for critical generation tie lines. This type conductor is also used internationally by utilities like British Columbia Transmission Corporation and Shangai Power.

Because a high-performance conductor has less weight and lower thermal expansion, resulting in less sag for an equivalent strength and durability as ACSR conductor, an alternative conductor may be able to partially satisfy project objectives and simultaneously avoid the need to rebuild towers in the corridor. For example, 1033 "Curlew" ACCR has essentially the same diameter as 1033 "Curlew" ACSR, it weighs about 15% less but has a rated power transfer capacity that is 85% higher than ACSR.

Composite reinforced conductors are available in configurations and sizes that appear to achieve much if not all of the Proposed Project's objectives, especially if composite conductors are double-bundled. To avoid the impacts of rebuilding existing towers, using a high-performance conductor in lieu of the existing 1033.5 kcmil ACSR on the existing double-circuit 220 kV towers within the corridor appears to be feasible and warrants closer analysis.

Using these lighter-weight conductors on the existing double-circuit towers would increase the capacity of the circuits and postpone the impacts of rebuilding the towers as proposed. The weight of the Drake 795 ACCR per linear-foot is about 70 percent as heavy as the existing 1033.5 kcmil ACSR used in the corridor. (ACSR and ACCR Weights and capacities derived from vendor technical properties fact sheets. Rated ampacity at 75^{o} C for ACSR and 210^{o} C for ACCR.)[1]

Data Requests. Please answer the following additional questions regarding the potential use of ACCR.

(A) SCE's response to ALT-4 indicates an ampacity of 2,170 amps for a single 1590 ACSR conductor. We note that the manufacturer's rating for 1590 ACSR is 1,354 amps at 75^{o}C. Please provide both the normal and emergency rated ampacity that SCE uses for 1590 ACSR and 1033.5 ACSR specifying the conductor temperature for these ratings. Also, indicate whether the existing lines in the corridor utilizing 1033.5 ACSR conductor are designed for each of these conductor types and operating temperatures.

(B) ~~Please describe specific concerns, if any, regarding the structural ability of the existing double-circuit towers to support two circuits of ACCR in the following configurations~~ Please address the following:

(1) **<u>Describe any general concerns about the use of ACCR in the SCE system.</u>**

<u>(2) Describe any concerns about the use of two circuits of ACCR in the following configurations for the WOD system in particular:</u>

- Single-conductor Drake 795 ACCR (Rated Ampacity: 1,691 A per circuit).
- Single-conductor Bittern 1272 ACCR (Rated Ampacity: 2,162 A per circuit).
- Double-bundled Dove 557 ACCR (Rated Ampacity: 1,332 A per conductor double-bundled to achieve 2,664 A per circuit).

[1] http://solutions.3m.com/wps/portal/3M/en_US/EMD_ACCR/ACCR_Home/TechnicalInfo/ProductDataSpecs/

- Double-bundled Drake 795 ACCR (Rated Ampacity: 1,691 A per conductor double-bundled to achieve 3,382 A per circuit).
- Double-bundled Curlew 1033 ACCR (Rated Ampacity: 1,939 A per conductor double-bundled to achieve 3,878 A per circuit).

(C) Please provide **the following information**: ~~a Sag/Ten table for each of the conductor configurations listed above for spans representative of the existing double-circuit tower line.~~

1. **Provide a list of the ruling spans for the existing double-circuit line.**

2. **Provide Sag/Ten charts for the set of ruling spans identified in response to (C)(1) above for the existing line, and for the conductor types listed in (a) and (b) below. For the Sag/Ten information that SCE develops, use SCE standard conditions. For the HTLS conductors, also include high temperatures for normal and emergency conditions (210^{o} and 240^{o})**
   a. **SCE standard conductors (1033.5 and 1590 kcmil ACSR);**
   b. **Each of the 5 types of HTLS conductors identified in item (B).**

(D) Please describe specific concerns, if any, about the interconnection of ACCR conductors into existing substations.

(E) ~~If any of the existing double-circuit structures would require structural improvements to support the various ACCR sizes suggested above, please describe the general types of improvements that may be required, differentiating between tangent structures, angle structures and deadend structures.~~ **For SCE's standard double-circuit tower family please provide the following:**

1. **For angle and deadend structures, provide the maximum design line tension at each phase attachment point.**
   a. **Stipulate whether these tensions are factored working loads or un-factored loads.**
   b. **Indicate standard load factors used by SCE for structure loads.**
2. **For tangent structures, provide the maximum lateral wind design load in pounds at each phase attachment point.**
   a. **Stipulate if these loads are working loads or un-factored loads.**
   b. **Indicate standard load factors used by SCE for structure loads.**

(F) For the existing line, identify whether the design with the existing conductor and structure combination meets the "new" SCE standard for wind loading of 18 psf. Provide this response for tangent, angle and deadend structures. If not identify at what span length and/or tension the existing conductor and structure combination exceeds the design limit.

ALT-20 **[No Change from 12/8/14]** Given the general description of the configuration of 220 kV and 500 kV structures shown in the figure on the following page, please answer the following questions:

(A) Please review the preliminary cross-section (presented below), and comment on the assumptions on tower heights and separation of structures.

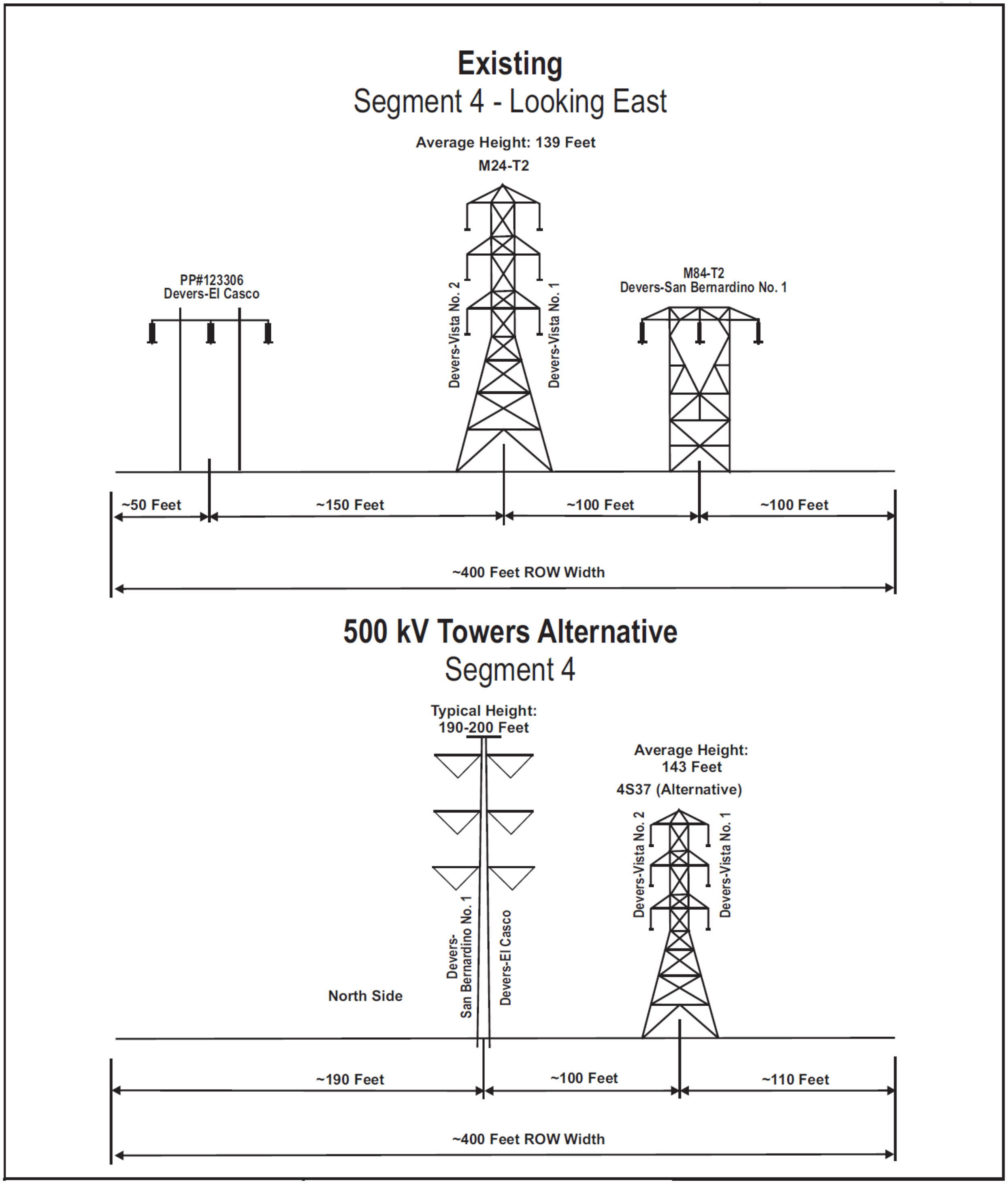
(B) For 500 kV TSPs to be installed in this corridor, and assuming the structure separation defined in (A) above between the 500 kV line and the new 220 kV structures, what would be the average span length?

(C) Please explain how 500 kV towers could be in installed in Segment 2 between San Bernardino Junction and the Vista Substation. Would these towers most likely be installed in SCE's southern separate corridor (currently unaffected by WOD-UP), requiring relocation of the existing 115 kV line currently unaffected by the project?

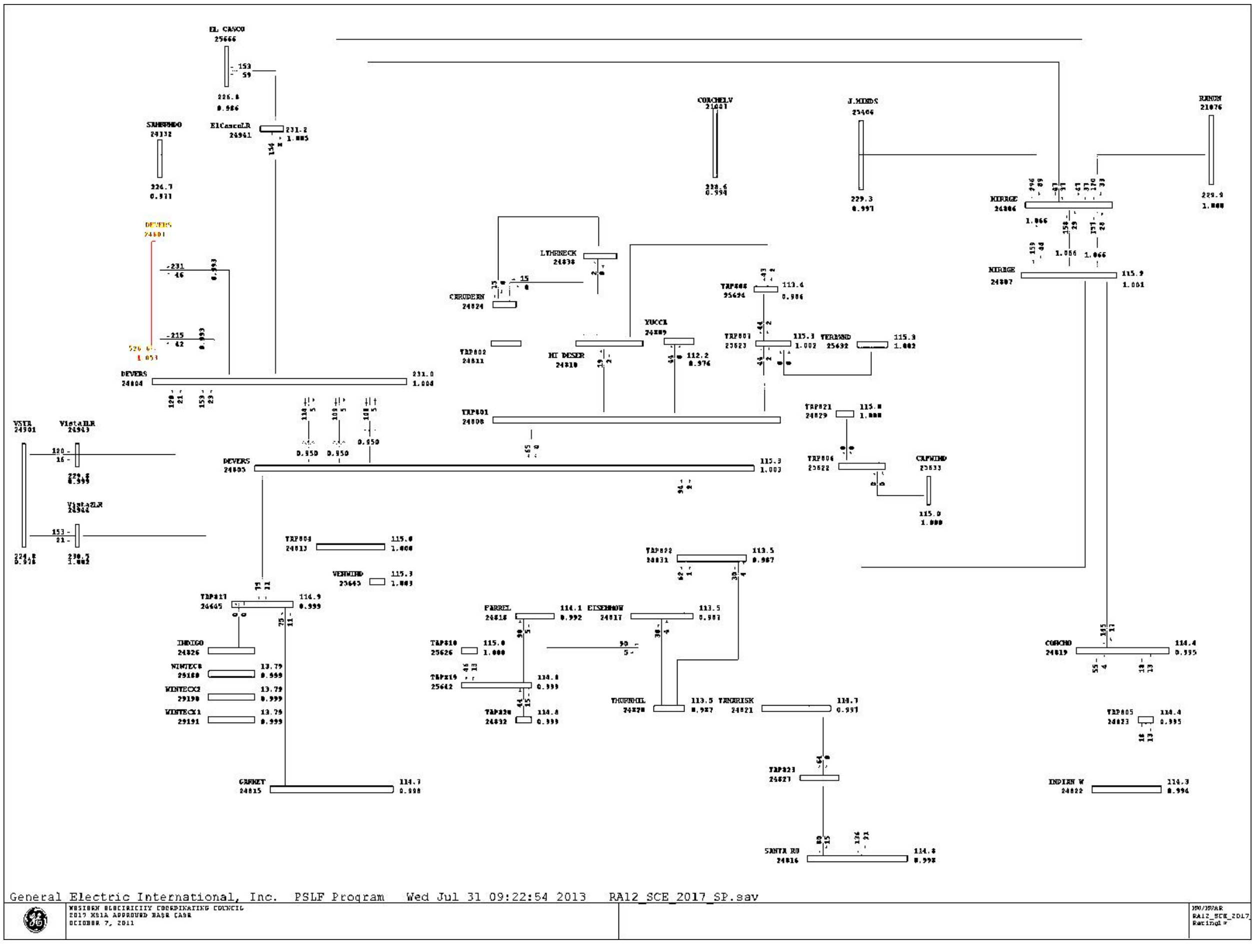
(D) What potential schedule delays could result from this design configuration? If delays could be longer than the 12 months addressed in ALT-17(E), please describe the specific consequences of the delay. What specific known projects would be affected in terms of their deliverability?

(E) Please describe any other specific feasibility concerns about this design.

Preliminary Corridor Cross-Section (Segment 4) – 550 kV Structures Replacing 220 kV



ALT-21 <u>**[No Change from 12/8/14]**</u> **Power Flow Data.** Power flow analysis will help the EIR/EIS team more clearly understand SCE's Project Objectives and Purpose and Need. We have reviewed the ORA Data Request #3 regarding power flow analysis, and request that in addition with providing us with SCE's response to that request, please also provide the associated "draw" files (*.drw). An example of the "draw" files is presented below.



Example of "draw" file output.