Southern California Edison
Circle City and Mira Loma-Jefferson PTC A.15-12-007

DATA REQUEST SET A1512007 ED-SCE-18

To: ENERGY DIVISION
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Question 18.02:

Section IV, Part B of the SCE Draft EIR comments indicate that the proposed Project would expose customers to less risk compared to the Alternative D1 battery storage facility because of SCE's limited operational experience with batteries. Please quantify the battery-associated risk in MW over time (e.g., 5 MW of battery risk by 2026, 5 additional MW of battery risk by 2028) and detail how long SCE expects it would take SCE to obtain sufficient operational experience with batteries relative to a staged battery rollout under Alternative D1 (e.g. of increments of 5 MW batteries over time based on load growth). Please indicate if SCE expects that its risk due to limited battery operational experience would be "all or nothing" on a battery life by battery life basis, or if the risk would be reduced over time within the operational life of an individual battery.

Response to Question 18.02:

There would be less risk with the Circle City Substation as compared to Alternative D1 due to the limited operational experience and performance data associated with battery energy storage as means to support grid needs under a broad-range of operational conditions that may occur under on-peak and off-peak and during normal and abnormal system conditions.

Any alternative to the SCE proposed Circle City Substation that would include battery energy storage facilities would have to be planned, designed, and intended to meet the identified capacity need of up to 20.3 MW. Per SCE's response to Data Request 16, Question 14c Supplemental, SCE indicated that a capacity need of 20.3 MW would require four battery storage installations which would consist of three 5 MW facilities and one 5.3 MW facility (nominal value) to meet the forecast deficiency in capacity versus demand under peak load conditions. Per SCE's analysis the installed and connected values for battery storage would be oversized only to account for battery degradation over time, power factor correction, and to address any reasonably expected variability in load forecast.[1] SCE's analysis did not include any oversizing of the battery installations in order to account for any risks associated with its limited operational experience with battery facilities and any potential associated under-performance issues. In other words, SCE assumed in its analysis that there would be no under-performance issues.

Per a conference call between SCE and the CPUC's consultants on August 28, 2018, SCE gained clarity on the CPUC's request related to the portion of this question that requested SCE to

provide a response to "how long SCE expects it would take SCE to obtain sufficient operational experience with batteries relative to a staged battery rollout under Alternative D1." SCE's understanding from that call was that the CPUC had been interested in knowing whether SCE had proposed its battery installations with added margin to account for operational uncertainties due to potential performance problems. Following the discussion, SCE understood that in its response it should address whether or not there was added margin included to address operational uncertainties and would SCE, after gaining operational experience, expect to be able to leverage that experience and demonstrate efficiencies in the sizing of subsequent installations. In response, SCE's analysis of battery energy storage facilities to address the 10-20 MW range of capacity deficit did not include any oversizing to account for battery performance issues. SCE does not anticipate that after the initial installation that there would be any efficiencies or optimizations that would reduce the proposed sizing of any installations subsequent to the initial 10 MW which could be attributed to operational experience gained. This is due to the fact that the initially proposed installation sizes were not upsized with additional margin to account for operational uncertainties but rather sized just to meet the identified peak demand deficits and a 20% margin for load growth variability.

While SCE would expect to gain invaluable and unprecedented operational experience through deployment of such battery storage facilities once they are integrated into the distribution grid and functioning in conjunction with existing facilities to address capacity needs under on-peak and off-peak periods as well as during normal and abnormal system conditions, at this time it is simply too speculative to "quantify the battery-associated risk in MW over time" until some level of that experience is gained. That said, SCE provided illustrative examples of operational conditions in its response to Data Request Set 18, Question 01. If directed to install the battery storage facilities, SCE would anticipate any risks of operational uncertainties to be minimal in the initial years, under the assumption that the battery storage facilities were installed prior to the anticipated date when a capacity deficit is forecast. For example, if the battery storage facilities were installed in 2021 and the first year of a capacity deficit was 2023, SCE would have approximately two years of operational experience with little-to-no risk of load being unserved should the batteries not perform as expected, if unaccounted for system operational conditions were to occur, or if there were only moderate variations in the current peak load forecast.

In summary, the load at risk over time related to relying on battery storage facilities over that of a substation would amount to any peak load amount that would be 1) in excess of the capacity installed by batteries or 2) in excess of available resources (existing electrical facilities plus the batteries) should any of the battery capacity prove to be unavailable.

[1] The sizing of battery storage facilities may be oversized to account for a variety of issues including such things as: degradation, power factor correction, load forecast variability, voltage support, and performance/availability issues. The upsizing that SCE included was only to account for variability in load forecasts (+ 20%) and for battery degradation and power factor correction (+20%) which results in at total proposed installation size of 29.2 MW (20.3 MW X 120% = 24.4 MW X 120% = 29.2 MW).