

**CAISO 2021 & 2025 Draft LCR Study Results**  
**Submitted by Smart Wires**  
**3/30/20**

Smart Wires appreciates the opportunity to comment on the CAISO's 2021 & 2025 Draft LCR Study Results.

In summary, our comments:

- Request that the CAISO quantify the amount of LCR that can be reliably reduced in the Contra Costa sub area via the Smart Wires line reactance project
- Provide costs and, under a separate submittal, change files related to two discrete project sizes. This information is intended to assist CAISO staff in determining the B/C ratio in the event that the CAISO determines a smaller solution is most optimal.
- Request that the CAISO approve the Smart Wires Tesla-Delta line reactance project upon completion of this 2021 LCR Study, should the CAISO's results and Smart Wires solution costs continue to yield a positive B/C ratio.

**Background:**

In the 2019-20 TPP the CAISO studied the Tesla-Delta Switchyard 230 kV Smart Wires line reactance project as one of 3 alternatives for reducing LCR in the Contra Costa Sub-Area. The Smart Wires solution was the only alternative found to have a B/C ratio higher than 1, and the CAISO noted that the solution could reduce LCR by as much as 1275 MW with a B/C ratio of 2.1 to 3.9 for NP26 and SP26 local capacity, respectively, vs system capacity. (See revised 2019-20 TPP Study results, table 4.10-17)

The 2019-20 TPP report concluded that *"the Tesla Delta Switchyard 230 KV line reactance project provides significant reduction in Contra Costa sub-area's capacity requirements, however, the need of the same resources towards satisfying the overall GBA requirements still needs to be evaluated. The evaluation will be part of the 2021 LCR Study. The evaluation will be part of the 2021 LCR study which will also include the recently changed LCR criteria. Furthermore, Marsh Landing units 3 and/or 4 are currently required for black start purposes, therefore the benefit to cost ratio may need to be adjusted. For these reasons this alternative is not recommended for approval at this time"*

Smart Wires requests that the CAISO finalize their determination regarding the amount of LCR capacity that can be reliably reduced in the Contra Costa sub area and define the B/C ratio associated with the Smart Wires line reactance project for doing so. If the cost-benefit ratio remains greater than 1, Smart Wires requests approval for the Tesla-Delta Line Reactance solution to enable this LCR reduction and benefit for ratepayers.

### **Economic Solution for Tesla – Delta Switchyard 230 kV**

Smart Wires submitted a project study request in the 2019-20 TPP which leverages the SmartValve, a modular Static Synchronous Series Compensator (SSSC). The proposed solution would reduce ~1,275 MW of LCR by introducing 12.5 ohms of reactance in series with the Tesla – Delta Switching Yard 230 kV line.

Smart Wires’ planning level cost estimate for a 12.5-ohm series reactance injection on the Tesla – Delta Switchyard 230 kV line via the SmartValve was conservatively estimated at a maximum cost of \$5.4M. This proposed solution provides flexibility in that it can be operated as needed for this application to ensure reliability. Furthermore, the solution can be scaled down in both size and cost should the CAISO’s assessment determine that a lower amount of LCR reduction be most optimal.

In addition, the SmartValve can introduce line reactance when needed and can internally bypass during normal operation to reduce system losses. The devices can also be re-deployed in the future should the need on this line be alleviated, or scaled up should the need grow.

The draft 2021 and 2025 draft Study Results show the LCR in Contra Costa Sub-Area to be 1119 MW and 1417 MW in 2021 and 2025 respectively. Additionally, Smart Wires understands ~398 MW of the Marsh Landing units within Contra Costa may be required for black start purposes, and this may influence the potential need for LCR reduction. If Marsh Landing units remain available, it appears the Sub-Area’s LCR could be reduced to ~721 MW. (721 MW was derived from 1119 MW total sub-area LCR minus 398 MW from Marsh Landing that remain for black start). For study year 2025, the reduction in LCR that would be beneficial increases to ~1,020 MW (1,417 MW - 398 MW).

In addition, Smart Wires noted that the CAISO draft 2021 / 2025 LCR Study conveyed that some of the Contra Costa Sub-Area resources may be needed for satisfying the overall Greater Bay Area’s capacity requirements. However, it is Smart Wires understanding that the effectiveness factor of Contra Costa generation on the GBA LCR constraint, Metcalf 500/230 kV bank, is relatively ineffective at 3%. (See “Table 3B – Generation Effectiveness Factors - Individual Elements” on page 46 of <http://www.caiso.com/Documents/2210Z.pdf>). Therefore, Smart Wires believes that a reduction of ~721 MW in 2021 and ~1,020 MW in 2025 should be both feasible and beneficial for ratepayers and looks forward to the CAISO’s more detailed efforts to quantify the B/C ratio of the potential Smart Wires solutions.

As noted above, Smart Wires proposed a 12.5-ohm solution in the 2019-20 TPP. That solution provides up to 1,275 MW of LCR reduction. However, if a reduced solution size is found to be most economic, Smart Wires can deliver a scaled down deployment. Smart Wires has prepared a cost estimate and provided a change file for an 8-ohm solution to facilitate the CAISO’s assessment in this regard. As such, Smart Wires can deliver an 8-ohm solution for an estimated cost of \$4.4M. This solution is presented to provide CAISO with one additional degree of flexibility should the full 12.5 ohm / 1,275 MW reduction not be required.

Smart Wires will separately provide specific change files for both the 12.5 and 8 ohm solutions.

**Approval of the Tesla-Delta 230 kV Line Reactance Project Following Completion of the 2021 LCR Study**

Should the CAISO's updated analysis show a B/C ratio higher than 1 for this project, Smart Wires respectfully requests that it be approved upon completion of this 2021 LCR study (as part of the 2019 – 2020 Transmission Planning cycle). Pending approval, Smart Wires would stand ready to deliver the SmartValve devices and support an installation in time for summer 2021. Smart Wires believes that approval of this project following completion of the LCR study will enable the CAISO to deliver the associated ratepayer benefits at the earliest date possible.