



### 2019-2020 Transmission Planning Process

Submitted by	Company	Date Submitted
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Smart Wires appreciates the opportunity to provide comments on the 2019 / 2020 Transmission Planning Process and recognizes that these comments are being submitted past the CAISO's defined comment period.

Upon further review of the Preliminary Economic Assessment presented at the CAISO's November 18<sup>th</sup>, 2019 stakeholder meeting, Smart Wires identified that one of the areas highlighted for potential LCR reduction in 2028 may also benefit from LCR reduction today. Smart Wires has completed preliminary scoping for a solution that could enable this LCR reduction and has included details regarding the potential solution below. Smart Wires believes that this solution may be able to provide benefit to ratepayers as early as 2021.

Smart Wires recognizes that this is a late comment submission and apologizes for not completing this analysis within the defined comment period. Smart Wires will ensure that all future comments are submitted within the established comment windows and would greatly appreciate the CAISO's review of this late submittal, if feasible.

#### **Overview of Contra Costa Constraint Identified:**

The Preliminary Economic Assessment presented on November 18<sup>th</sup>, 2019 included LCR constraints in the Contra Costa subarea for the 2028 planning horizon. It was observed that the most limiting constraint identified for 2028 (the Tesla-Delta Switching Yard 230 kV line<sup>1</sup>) is the same in both nature and magnitude, as the most limiting constraint identified in 2020<sup>2</sup> and years prior. Given that the identified 2028 constraint exists today, Smart Wires believes that there is opportunity to deliver the rate payer benefit quantified as early as 2021.

The CAISO identified the Tesla - Delta Switching Yard 230 kV transmission line as the limiting element into the Contra Costa subarea and that limitation increased the subarea's capacity requirement by 668 MW. Two individual solution options were studied by CAISO in the Preliminary Economic Assessment. These options included a reconductor of the constrained line and battery storage. These mitigations were shown to provide a benefit to cost ratio of 0.2 and 0.04 respectively.

Smart Wires has studied the potential to reduce this constraint with a SmartValve power flow control solution, using the 2020 LCR Contra Costa base case published by the CAISO earlier this year. Smart Wires' assessment showed that a 12.5-ohm increase in line reactance on the Tesla – Delta Switchyard 230 kV line would reduce the subarea's capacity requirement by ~668 MW. The net present value of the

<sup>1</sup> See pdf pages 125 – 130, <http://www.caiso.com/Documents/Presentation-2019-2020TransmissionPlanningProcess-Nov182019.pdf>

<sup>2</sup> See pdf pages 92 - 94, <http://www.caiso.com/Documents/Final2020LocalCapacityTechnicalReport.pdf>.

benefit is estimated to be between \$7.7M and \$14.4M using CAISO values for local capacity cost vs NP26 and SP26 capacity costs respectively.

**Overview of Smart Wires Proposed Solution:**

The Smart Wires SmartValve solution leverages a modular Static Synchronous Series Compensator (SSSC) which injects a leading or lagging voltage in quadrature with line current to control impedance.

To deliver the 12.5 ohm increase in line reactance required, Smart Wires would leverage (15) SmartValve 5-1800i devices in series with the Tesla – Delta Switchyard 230 kV line. The SmartValve 5-1800i devices provides a series voltage injection of up to 2830 V RMS, with a continuous current rating of 1800 A RMS. The (15) SmartValve solution would leverage five devices per phase and enable up to 14,150 V RMS in quadrature with the line's current. The proposed solution would therefore be capable of providing up to 12.5 ohms at the line's rated emergency current of ~1130 A RMS.

This proposed solution provides flexibility in that it can be operated as needed for this application to ensure reliability. The series reactance can be injected during the N-0 state or following any limiting contingencies. The addition of 12.5 ohms translates to an increase of 0.02363 per unit on a 230 kV circuit. These devices can also be re-deployed in the future if they are determined to no longer needed on this line.

The planning level estimate for the total installed cost of the proposed SmartValve solution is \$4M - \$5.4M.

We have also attached the \*.p file used to model the proposed solution to the submission request and would be happy to provide further information to CAISO staff regarding the costs of the solution or the modeling methods used.

Smart Wires believes our proposal to use a Grid Enhancing Technology to solve the Contra Costa Constraint can provide significant near term benefit for CAISO customers if implemented. Thank you for your consideration of this proposal.