

**Smart Wires Stakeholder Comments and Economic Study Requests for the  
CAISO 2020-21 TPP Study Plan  
2020-21 TPP Phase 1 Submittal, March 13, 2020**

Smart Wires appreciates the opportunity to provide input for the 2020-2021 TPP assessment and is encouraged by the potential this process enables for ensuring reliability while increasing efficiency of the system for the benefit of California’s ratepayers. Smart Wires sees considerable opportunity to reduce energy and capacity costs with flexible and targeted power flow control solutions, many of which are presented in the comments below. Smart Wires asks that the CAISO leverage their expertise to further explore opportunities to not only increase grid efficiency but create a more flexible network designed to accommodate future uncertainty.

Transmission Planning is an evolving process which must account for the increasingly dynamic and unpredictable trends of climate change driven policy and market changes. Smart Wires believes modular power flow control technology, namely the SmartValve™, is uniquely positioned to help transmission systems accommodate these uncertain long-term planning assumptions. The comments below provide potential methods and locations where Smart Wires’ sees current opportunity for leveraging this technology to increase grid efficiency and reduce costs for ratepayers.

**1. Ensure Consideration of Power Flow Control Alternatives**

Smart Wires requests that the CAISO evaluate power flow control solutions, (PFC), as an alternative for all reliability, economic, or public policy needs identified within meshed areas of the network.

Smart Wires believes CAISO’s adoption of such a practice has the potential to yield significant cost savings and enhance grid flexibility. The exact location of new generation additions, associated dispatch profiles, and load forecasts have become increasingly difficult to predict. Flexible power flow control solutions provide an alternative for efficiently managing the network amidst these uncertain planning assumptions. PFC solutions can resolve long term planning needs at significantly lower costs when compared to traditional fixed infrastructure investments while minimizing impact on the environment and reducing permitting requirements.

Smart Wires recognizes that power flow control is not a “one-size-fits-all” solution, but recommends that the CAISO consider it as part of their evaluation for all thermal constraints identified in meshed areas of the network. In doing so, Smart Wires believes that the CAISO may identify additional opportunities to provide ratepayer savings and implement solutions with the greatest societal benefits.

## 2. Economic Study Request - Power Flow Control for Congestion Reduction on the California-Oregon Intertie (COI)

Smart Wires requests that the CAISO study all options to relieve COI congestion and the previously reported reliability constraints, including Smart Wires' COI submission during the 2019-2020 TPP reliability window.

Traditionally, CAISO has included "congestion management" as an alternative for resolving reliability problems such as potential overloads on COI. While Smart Wires supports using "congestion management" as a mitigation measure, given there is always a viable generation dispatch to resolve these overloads, such constraints then become an economic problem. As such, Smart Wires requests CAISO assess all solution options for the COI including the RAS to bypass the series capacitors, via the Transmission Economic Assessment Methodology (TEAM) framework. In the 2019-20 TPP, Smart Wires submitted the following solution:

- SmartValve installations on:
  - a. Round Mountain – Table Mountain 500 kV Lines #1 and #2,
  - b. Cottonwood E – Round Mountain 230 kV line #3, and
  - c. Delevan – Cortina 230 kV
- An alternative is to deploy a hybrid solution to include:
  - a. SmartValve deployments on Round Mountain – Table Mountain 500 kV Lines #1 and #2, and
  - b. reduced COI flow for the remaining constrains on the Cottonwood E – Table Mountain 230 kV line #3 and Delevan – Cortina 230 kV line.

CAISO had concluded, in the draft 2019-2020 report, that *"although the ISO agrees that the proposed project can mitigate the identified overloads, there is not a reliability need for such project, since the overload can be mitigated by bypassing series capacitors on the Round Mountain-Table Mountain 500 kV lines"* without addressing the costs or feasibility associated with designing and installing the RAS.

It is Smart Wires' belief that relying on congestion management for a reliability need is contradictory in nature and indicates that the need is purely economic. Furthermore, when base cases have N-1 overloads which can be secured via re-dispatch, the base case is then not in line with realistic operating scenarios. It's Smart Wires' belief that generation dispatch in reliability base cases should incorporate every attempt to secure N-0 and N-1 overloads as to not conflate economic problems for reliability problems.

Given the modular nature of Smart Wires' proposed solution, Smart Wires is supportive and ready to engage in collaborative revisions to optimize the size of each deployment should CAISO's analysis show that scaling the deployments up or down would provide additional benefit.

Smart Wires has not observed a proposed timeframe for implementation of the series capacitor bypass RAS in the 2019-2020 Transmission Plan. If that planned implementation is prior to completing the 2020-21 TPP, Smart Wires asks the CAISO consider all solutions through an economic lens before moving ahead with the RAS.

Smart Wires is wholly supportive of the previously recommended RAS solution if it is deemed the most beneficial system enhancement for the ratepayers of California via TEAM. Smart Wires also requests CAISO to consider the lifecycle analysis on the series capacitors which are being proposed to be bypassed. A SmartValve solution on Round Mountain – Table Mountain 500 kV lines #1 and #2 would not only mitigate current overloads but could contribute to, and be scaled up to, replace the aging series capacitor facilities should that be required in later years.

**3. Economic Study Requests to Reduce Local Capacity Requirements (LCR) Using Power Flow Control**

The Local Capacity Technical Studies for years 2020 and 2024 present several thermal constraints driving LCR requirements on meshed networks. In the 2019-2020 TPP cycle, Smart Wires provided a solution alternative to cost effectively reduce the LCR requirements in the Contra Costa sub-area by impeding flow on the Tesla – Delta Switchyard 230 kV constraint. Given the positive B/C ratio of the Smart Wires proposed Contra Costa Sub-Area solution, Smart Wires is hopeful that solution will be approved as part of the 2019-20 TPP. However, if the CAISO does not approve the Contra Costa sub area LCR solution in the 2019-20 TPP, Smart Wires requests the solution be studied in the 2020-21 TPP.

In addition, Smart Wires believes similar LCR constraints can be mitigated via power flow control, and requests CAISO continue its efforts in reducing local capacity costs by assessing the following power flow control solutions via the TEAM framework in the 2020-21 TPP.

**a. Power Flow Control for LCR reduction in the South Bay - Moss Landing Sub-Area**

Smart Wires requests the CAISO study power flow control solutions to optimally divert power away from the Moss Landing – Las Aguilas 230 kV constraint. Smart Wires believes there is adequate transmission capacity on the parallel facility during the reported P6 contingency of Tesla – Metcalf 500 kV and Moss Landing – Los Banos 500 kV to reduce the LCR requirement. Potential for LCR reductions could be as high as ~1780 MW.

**b. Power Flow Control for LCR reduction in the Ames – Pittsburg – Oakland – Sub-Area**

Smart Wires requests the CAISO study power flow control solutions to optimally divert power away from the Ames-Ravenswood 115 kV and Moraga-Claremont 115 kV transmission constraints. Smart Wires believes there is adequate transmission capacity following the limiting contingencies reported in the most recent Local Capacity Technical Studies. Potential for LCR reductions could be as high as ~1560 MW.

**c. Power Flow Control for LCR reduction in the Fresno Area**

Smart Wires requests the CAISO study power flow control solutions to optimally divert power away from the Gates - Mustang 230 kV constraint. Smart Wires believes there is adequate transmission capacity following the limiting contingencies reported in the most recent Local Capacity Technical Studies. Potential for LCR reductions could be as high as ~1700 MW.

**d. Power Flow Control for LCR reduction in the Western LA Basic Sub-Area**

Smart Wires requests CAISO study power flow control solutions to optimally divert power away from the Mesa - Laguna Bell 230 kV constraint. Smart Wires believes there is adequate transmission capacity following the limiting contingency of Mesa - Redondo 230 kV and Mesa - Lighthipe 230 kV to cost effectively reduce LCR requirements.

In the 2019-2020 TPP cycle, CAISO considered a solution alternative comprised of (1) a series reactor to reduce Western LA sub-area requirements and (2) reconductoring to reduce El Nido sub-area requirements. Given the Western LA Basin and El Nido sub-area LCR deficiencies reported in the Local Capacity Technical Study for study year 2024 are 3783 MW and 393 MW respectively, Smart Wires believes a power flow solution, when studied alone, could dramatically reduce Western LA sub-area requirements.

**Conclusion:**

In summary, Smart Wires appreciates the opportunity comment on the 2020 – 2021 transmission planning process and believes that the opportunities noted above may provide potential to increase network efficiency and deliver additional benefits for California’s ratepayers. Smart Wires looks forward to the development of the 2020 – 2021 TPP and stands ready to assist the CAISO with further evaluation regarding the comments noted in any capacity, if or as needed.