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COMMENTS OF THE PUBLIC ADVOCATES OFFICE ON THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR'S (CAISO) 2018-2019 TRANSMISSION PLANNING PROCESS (TPP) PACIFIC NORTHWEST TRANSFER CAPABILITY INFORMATIONAL SPECIAL STUDY PRESENTATION AND STAKEHOLDER MEETING ON NOVEMBER 26, 2018.

December 12, 2018

The Public Advocates Office at the California Public Utilities Commission (Cal Advocates), formerly the Office of Ratepayer Advocates,¹ is the state's independent consumer advocate with a mandate to obtain the lowest possible rates for utility services, consistent with reliable and safe service levels, and the state's environmental goals.

The Public Advocates Office submits the following four recommendations on the California Independent System Operator's (CAISO) 2018-2019 Transmission Planning Process (TPP) Pacific Northwest Transfer Capability Informational Special Study results presented during the stakeholder meeting on November 26, 2018.

1. Provide the economic impact of increasing the transfer capability in the north to south direction between the Pacific Northwest and California.

The CAISO's transfer capability study results demonstrate that there are operational concerns with increasing the transfer capability in the north to south direction between the Pacific Northwest and California. With transfer capability increases in the north to south direction under N-2 contingencies, the CAISO notes that there are adverse outcomes such as overloading and voltage issues.² The CAISO proposes the following mitigation measures to address these

¹ The Office of Ratepayer Advocates was renamed the Public Advocates Office of the Public Utilities Commission pursuant to Senate Bill No. 854, which was signed by the Governor on June 27, 2018 (Chapter 51, Statutes of 2018).

² *Informational Study: Increased Capabilities for Transfers of Low Carbon Electricity Between the Pacific Northwest and California, 2018-2019 Transmission Planning Process Stakeholder Meeting*

outcomes: load shedding and additional voltage support³ in California, increased generation tripping in the Pacific Northwest, and the use of Flexible Alternating Current Reactive Insertion (FACRI)⁴. The CAISO did not provide the quantity and costs for these proposed mitigation measures. The Public Advocates Office requests that the CAISO provide cost estimates for its proposed mitigation measures to increase transfer capability between the Pacific Northwest and California in its final special study report.⁵ The CAISO should also further explain the potential gain from the proposed load shedding and increased generation tripping mitigation measures in its final special study report. If mitigation measures in the north to south direction are pursued, the Public Advocates Office requests that the CAISO determine the economic impact of these mitigation measures to the Pacific Northwest region for cost allocation purposes.

2. Provide the economic impact to California of increasing the transfer capability in the south to north direction between California and the Pacific Northwest.

The CAISO's transfer capability study results demonstrate that there are also operational concerns with increasing the transfer capability in the south to north direction from California to the Pacific Northwest. These operational concerns include congestion and thermal overloads.⁶ Specifically, the results from the CAISO's sensitivity studies reveal that increasing the path rating on the Pacific Direct Current Intertie (PDCI) above 1,000 megawatts (MW) would result in congestion in the south to north direction.⁷ Congestion would also occur on Path 26 in the south to north direction under the 1,000 MW path rating PDCI sensitivity that would have a monetary impact.⁸ The proposed mitigation measures to address congestion on the PDCI include: Remedial Action Schemes (RAS), generation curtailment, and phase shifter transformer upgrades.⁹ To better understand the economic value of these proposed mitigation measures, the CAISO should determine the demand for California's excess energy in the Pacific Northwest, and the potential revenue California could receive from the transfer of its excess energy to the Pacific Northwest. These monetary benefits could then be compared to the costs of the proposed mitigation measures.

November 26, 2018, November 26, 2018, CAISO, (Pacific Northwest Transfer Capability Study), slide 14.

³ Voltage support could be provided using series capacitors.

⁴ A system that helps to increase transmission line voltage and transfer capability.

⁵ *California ISO (CAISO) 2018-2019 Transmission Planning Process (TPP) Pacific Northwest Transfer Capability Informational Special Study Meeting*, November 28, 2018, Customized Energy Solutions, p. 3.

⁶ Pacific Northwest Transfer Capability Study, slides 16, 17, and 19.

⁷ Pacific Northwest Transfer Capability Study, slides 43 & 46.

⁸ Pacific Northwest Transfer Capability Study, slides 43 & 46.

⁹ Pacific Northwest Transfer Capability Study, slides 20-22.

The Public Advocates Office requested that the CAISO determine the Pacific Northwest's demand for California's excess energy in its October 5, 2018 comments¹⁰ on the preliminary results from the 2018-2019 TPP. The Pacific Northwest's level of demand for California's excess energy has still not been provided.

Additionally, the economic value¹¹ of increasing the transfer capability in the south to north direction should be compared to the cost of new storage in California as an alternative means to utilize California's excess energy. As part of the 2018-2019 TPP, the CAISO is considering storage to address existing congestion and renewable curtailment in southern California's renewable procurement locations.¹²

If transfer capability mitigation measures in the south to north direction are pursued, the Public Advocates Office requests that the CAISO determine the economic impact of these mitigation measures to the Pacific Northwest region for cost allocation purposes.

3. Increased Coordination between the CAISO, the Bonneville Power Administration, and the Los Angeles Department of Water and Power

In its November 26, 2018 presentation, the CAISO stated that some conceptual operating mitigation measures for reliability concerns associated with changes to the PDCI flows are the responsibility of the Los Angeles Department of Water and Power (LADWP) because it is the operating agent for the PDCI at the southern terminal.¹³ Furthermore, the CAISO indicated that joint studies with the Bonneville Power Administration (BPA) and LADWP will be performed to fully assess and determine the necessary modifications needed to automate control of the PDCI

¹⁰ *Public Advocates Office's comments on the 2018-2019 Transmission Planning Process – Preliminary Results and Stakeholder Meeting on November 16, 2018*, October 5, 2018, p. 2.

¹¹ The cost of the proposed transfer mitigation measures in comparison to the potential monetary benefit from these transfers.

¹² *2018-2019 Policy-driven Assessment, 2018-2019 Transmission Planning Process Stakeholder Meeting*, November 16, 2018, slides 45-46. And *Economic Planning-Preliminary Production Cost Simulation Results, 2018-2019 Transmission Planning Process Stakeholder Meeting*, November 16, 2018, slides 4-21. It was observed that SCE Nol Kramer-Inyokern renewable zone is experiencing significant congestion and renewable curtailments. This renewable zone is also anticipated to have new solar development to meet the state's Renewable Portfolio Standard targets. As part of the 2018-2019 TPP, the CAISO will explore and test energy storage as a mitigation for relieving congestion in the Kramer/Inyokern renewable zone.

¹³ Pacific Northwest Transfer Capability Study, slide 20.

using Automatic Generation Control (AGC) systems.¹⁴ This would allow implementation of sub-hourly scheduling on the PDCI.¹⁵

The Public Advocates Office recommends that the CAISO, LADWP, and BPA should collaborate and study the PDCI and the California-Oregon Intertie (COI). As part of this collaboration, the CAISO should determine BPA's and LADWP's scheduled usage of the COI and the PDCI to determine the feasibility of increasing dynamic transfers or implement sub-hourly scheduling on these paths.

4. Conduct Additional Hydroelectric Sensitivity Studies

As the CAISO stated in its November 26, 2018 presentation, effective modeling of hydroelectric output is critical to studying the transfer capabilities of low carbon electricity between the Pacific Northwest and California.¹⁶ Thus far, the CAISO methodology for estimating hydroelectric production includes working with the Northwest Power and Conservation Council (NWPCC) and BPA to develop high, medium and low cases based on historical data.¹⁷ This technical analysis can be conducted with the available information.

The final report should address how state and federal policies could affect the hydroelectric production calculations in this study. While such policies cannot impact factors such as weather, policies such as dam upgrade spending and new hydro development will affect hydroelectric production. For example, in late 2016, the United States Department of Energy released a vision for the future of hydropower that stated that the combined hydroelectric generating and storage capacity in the United States could grow by 49 gigawatts (GW) by 2050 and that such growth would yield significant emissions reductions and reliability benefits.¹⁸ The report outlines how improvements to existing facilities could, alongside with new dam construction, contribute to an increase in hydroelectric production. It specifically references how turbine replacements at the Wanapum Dam in Washington increased generation by an average of 3.3%.¹⁹ If investments for hydro infrastructure improvements are adopted as federal or state policies, it would be possible

¹⁴ AGC is a synchronized system that enables continuous balancing of resources and load within the CAISO-controlled grid and helps to maintain frequency during normal operating conditions.

¹⁵ Pacific Northwest Transfer Capability Study, slide 56.

¹⁶ Pacific Northwest Transfer Capability Study, slide 6.

¹⁷ Pacific Northwest Transfer Capability Study, slide 30.

¹⁸ *Hydropower Vision: A New Chapter for America's 1st Renewable Electricity Source*. July 26, 2016. US Department of Energy. p, xvii. Retrieved from: <https://www.energy.gov/sites/prod/files/2016/10/f33/Hydropower-Vision-Executive-Summary-10212016.pdf>

¹⁹ *Hydropower Vision: A New Chapter for America's 1st Renewable Electricity Source*. July 26, 2016. US Department of Energy. P.147. Retrieved from: <https://www.energy.gov/sites/prod/files/2016/10/f33/Hydropower-Vision-Executive-Summary-10212016.pdf>

to see how the subsequent increase in hydroelectric production could impact transfer capacity between the Pacific Northwest and California. The final study should provide a high-level analysis of the hydroelectric policy landscape and how it could impact the study's conclusions.

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