

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

Reliability Technical Conference

Docket No. AD21-11

**COMMENTS OF THE
CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION**

The California Independent System Operator Corporation (“CAISO”) submits these comments in connection with the Commission’s September 30, 2021 Reliability Technical Conference.¹ The CAISO’s comments address panel 4 questions regarding maintaining electric reliability with the changing resource mix.

1. Given the evolving resource mix, does the current approach to how services and products are procured need to be revised in order to ensure reliable operation of the Bulk-Power System?

In the Western Interconnection, the majority of forward procurement occurs through integrated resource planning processes. The CAISO believes increased coordination across the western region by utilities and state authorities in their resource procurement decisions will enhance each balancing authority area’s ability to integrate a diverse set of technologies and a resource mix that leverages geographic diversity.

In the context of energy and ancillary services products, centralized procurement and dispatch of these products will advance efficient integration of

¹ On January 7, 2022, the Commission issued a notice soliciting post-technical conference comments in connection with the September 30, 2021 Reliability Technical Conference to discuss policy issues related to the reliability of the Bulk-Power System.

larger numbers of inverter-based resources in a more reliable manner and with more economic unit commitment. The CAISO is exploring new market products to help manage variability and uncertainty arising from the evolving resource mix.

Specifically, the CAISO is exploring an additional day-ahead market reserve product - imbalance reserves - to address this challenge. Imbalance reserves would schedule and price both upward and downward energy ramping capability in the day-ahead timeframe to help manage real-time energy imbalances and energy ramping needs. The CAISO's day-ahead market would co-optimize imbalance reserves with energy and existing ancillary services. The CAISO is also exploring adding the capability to procure downward capacity in the day-ahead market's residual unit commitment process.

In addition to day-ahead market enhancements, the CAISO plans to refine its existing flexible ramping product that is part of its real-time market. This enhancement will schedule and price the flexible ramping product based on the location of the supply resource providing it. This will significantly improve the flexible ramping product's scheduling and pricing, better enable the real-time market to meet net load uncertainty and energy, and improve the real-time market's ability to reflect supply conditions in its prices.²

- a. Should the foundational performance criteria that inform decisions about the amount and type of reserves procured (e.g., procuring reserves based on the most severe single contingency), be**

² For more information on the CAISO's planned market reforms please see comments filed by the CAISO on February 4, 2022 in Docket AD21-10: <https://elibrary.ferc.gov/eLibrary/filedownload?fileid=EBA2A420-3B57-C414-9CEC-7EC69F300000>

reconsidered? Do the present system performance indicators need to evolve? If so, how?

Current parameters for setting operating reserve procurement targets continue to function, but operators need the flexibility to meet new operating challenges. In addition, the Commission should support efforts to refine reserve requirements to address variability and net load uncertainty between day-ahead and real-time.

i. Has the required volume of the operating reserves evolved in recent years? For example, to account for the behavior of IBR? If so, how?

The CAISO has established contingency reserve procurement targets that exceed requirements set forth in applicable reliability standards during times when online solar photovoltaic resources equipped with legacy inverters are operating. Based upon the studied and observed occurrences, this capacity may be at risk of cessation during certain voltage fluctuation situations.³

ii. Do the present performance requirements for a balancing authority reflect the characteristics of the current resource mix?

The Commission and the North American Electric Reliability Corporation (NERC) should consider facilitating additional discussions regarding the need to revisit control performance standards that apply to balancing authority functions. The current standards are based on operating conditions reflecting more controllable supply and predictable demand. However, electric system conditions have changed, and now reflect far greater volumes of variable supply and increasingly

³ CAISO Operating procedure 1210 at 24: <http://www.caiso.com/Documents/1210.pdf>

unpredictable demand. Balancing authorities must balance supply and demand on an extremely granular level. During N-0 conditions, the Commission and NERC may want to explore whether to modify the existing “BAL – Resource and Demand Balancing” operating standards to provide greater flexibility to balancing authorities.

2. Should new services or products be considered in order to ensure reliable operation of the Bulk-Power System? If yes, what new services and products should be considered?

As referenced in response to question 1, the CAISO has observed increased uncertainty in the net load the CAISO needs to balance. This uncertainty arises from greater variability in both sources of supply and electricity demand. The CAISO is working to implement enhancements to improve the functionality of the existing flexible ramping product and is developing a new ramping product in the day-ahead market called imbalance reserves. This product will reserve and price capacity in the day-ahead timeframe to meet net load variability that may materialize in real-time. It will also help assure there is sufficient capacity in real-time to balance load in both the upward and downward directions.

3. In addition to current initiatives, what further actions should NERC take to ensure robust integration of future generation of IBRs into the power system? Examples of such action areas include enhanced understanding of the impact of IBRs on power system performance, functionality improvements and grid forming IBRs, modeling and coordination of transmission and distribution connected IBRs. Are there complementary initiatives in industry or at the state level, and when are they projected to be completed?

NERC and industry should prioritize the development of a comprehensive generator ride-through reliability standard to ensure new resource technologies can operate through transient grid events. NERC and industry need to ensure generator interconnection models are sufficiently robust and accurate. This will require

coordination among developers, Planning Authorities, NERC and Regional Entities. The Commission and NERC should support these efforts by fostering industry dialog regarding the development and validation of non-proprietary models and, where appropriate, enhance reliability standards and compliance, monitoring, and enforcement programs.

4. Do DERs and energy storage resources have attributes that can be leveraged to help with system reliability as a result of resource variability challenges of increasing VERs, both in the planning and operational time horizons? If so, how?

Grid connected energy storage is playing a significant role to meet ramping and net load needs. The CAISO now has over 2500 MW of grid connected battery storage participating in its markets and expects significantly more battery storage additions this summer and in the coming years. These resources, are bringing needed capabilities to charge and discharge power to help the CAISO balance variability and uncertainty in the near term. As the volume of renewable intermittent resources increases, the CAISO will also need longer duration storage as well as non-emitting resource technologies that have firm dispatch capabilities.

The proliferation of DERs also supports reliability needs. The CAISO has developed and will continue to refine pathways for wholesale market participation by flexible demand resources and incorporates forecasted DER development into its transmission planning process by relying on electric demand forecast prepared by the California Energy Commission. New sources of flexible demand, including electric vehicle charging and smart buildings, can also provide value to the electric system by helping shift and shape the load curve to relieve stress on the electricity grid.

5. Would further regional coordination of planning and operations among balancing authorities in a day-ahead or longer timeframe be beneficial to improve electric reliability and to better position the grid to manage real-time resource variability?

In the Western Interconnection, regional coordination across all planning and operational timeframes is critical to integrate greater volumes of inverter-based resources. The changing resource mix is occurring across the entire region, and balancing authorities in the Western Interconnection are part of an interconnected electricity system. The Commission should support efforts undertaken by these balancing authorities to leverage the diversity benefits of supply resources located across the Western region, as well as the different load curves of balancing authorities in the region.

A. What are the opportunities for better coordination of planning and operations among and between RTOs/ISOs and non-RTO/ISO regions to help manage electric reliability and real-time resource variability in light of the changing resource mix? Which opportunities represent “low-hanging fruit” for improving coordination? How can these changes be implemented?

An important next step is for the region to explore the design of a day-ahead market that would optimize the functionality of the Western Energy Imbalance Market (WEIM), expanding on economic efficiencies and advancing clean energy goals across the West. The CAISO is currently holding working group discussions with affected stakeholders to explore a day-ahead market design that could extend to WEIM participants.⁴ Balancing a diverse set of resources across the West in the

⁴ More information on the CAISO’s stakeholder process is available on the following website: <https://stakeholdercenter.caiso.com/StakeholderInitiatives/Extended-day-ahead-market>

day-ahead timeframe will unlock additional savings and support greater integration of renewable resources.

Regional coordination can better enable states to meet their reliability needs. An initial approach to this coordination is for the region to develop information sharing protocols for resource adequacy programs so administrators of resource adequacy programs understand what capacity is committed for resource adequacy purposes and for what timeframes. Sharing information will help mitigate the risk of double-counting capacity and two balancing authority areas relying on the same MW simultaneously. Also, exploring regional resource planning may allow states to best meet their electric demand needs and policy objectives more effectively and efficiently with a diverse set of resources, as well as share the costs of new resource development and transmission. This coordination is important because exploring regional resource planning decisions may allow states to best meet their electric demand needs with a diverse set of resources consistent with their policy objectives as well as share the costs of new resource development and transmission. The CAISO remains engaged with others in the region to discuss these important matters.

B. Have real-time imbalance markets (e.g., Energy Imbalance Market, Western Energy Imbalance Service) helped improve electric reliability and better positioned the grid to manage real-time resource variability in areas outside of organized markets? How can this be improved?

In the Western Interconnection, the WEIM has resulted in nearly \$2 billion in economic benefits since its inception in 2014. These benefits arise largely from real-time economic transfers of energy between participating balancing authority areas.

The WEIM has also facilitated the integration of larger volumes of renewable resources and enhanced reliability in the West. The ability to transfer energy in real-time among participating balancing authority areas has enhanced the region's ability to manage real-time resource variability across the overall WEIM area. The Commission should support ongoing efforts to refine the design of real-time imbalance markets to ensure they serve as an efficient and effective tool to balance supply and demand.

Respectfully submitted

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CERTIFICATE OF SERVICE

I certify that I have served the foregoing document upon the parties listed on the official service list in the captioned proceedings, in accordance with the requirements of Rule 2010 of the Commission's Rules of Practice and Procedure (18 C.F.R. § 385.2010).

Dated at Folsom, California this 22nd day of February 2022.

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