November 16, 2026

The Honorable Debbie-Anne A. Reese
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Re: California Independent System Operator Corporation
Docket No. ER27- ___-000
Large Loads Tariff Amendment
Response to Order to Show Cause

Dear Secretary Reese:

The California Independent System Operator Corporation (CAISO) submits this filing to (1) enhance its large load interconnection procedures through a tariff amendment, and (2) address the issues the Commission raises in its Order to Show Cause (Order).[1] Taken together, the CAISO and Participating Transmission Owner (PTO) tariff revisions supply the tariff-level clarity, customer protections, and operational tools the Order seeks. The result is a comprehensive near-term response to the Order that can accelerate viable large load projects without compromising reliability, affordability, or open access.

I. Executive Summary

California and the West have an established framework for integrating new load growth, including for data centers and other large loads. Through coordinated resource planning, long-term procurement of clean and reliable generation, and an unprecedented expansion of the transmission system, the CAISO and its PTOs are working to ensure that new demand can be served without compromising reliability or affordability. This work entails close, careful coordination with California's principal energy agencies, the California Public Utilities Commission (CPUC) and the California Energy Commission (CEC), and local regulators across the West. It also recognizes that generation and

[1] The CAISO submits this filing pursuant to section 205 of the Federal Power Act (FPA), 16 U.S.C. § 824d, and Part 35 of the Commission's regulations, 18 C.F.R. Part 35. Capitalized terms not otherwise defined herein have the meanings set forth in appendix A to the CAISO tariff, and references to specific tariff sections and appendices are references to sections and appendices in the existing CAISO tariff unless otherwise specified.

transmission are complementary investments: securing adequate generating resources is only valuable if those resources can be delivered where and when they are needed. By planning both in tandem over longer time horizons, California's framework supports continued investment in innovation, electrification, and advanced computing infrastructure while maintaining a reliable, resilient, and increasingly carbon-free electric grid for all customers.

The CAISO and PTOs have complementary and clearly defined responsibilities within this framework. The PTOs lead customer interconnection and the development, engineering, construction, and maintenance of the transmission facilities needed to reliably serve new and expanding customers. For more than a century, that work has enabled California's growth, supporting everything from Silicon Valley and the State's agricultural and industrial base to its ports, cities, and emerging centers of technological innovation. The CAISO builds on that foundation through independent, systemwide transmission planning, coordination of interconnection and grid-development activities, and reliability oversight, evaluating individual projects and load additions in the context of the broader needs of California and the Western interconnected system.

The Commission's Order asks whether the CAISO tariff remains just and reasonable as unprecedented large load growth tests utility tariffs nationwide. The CAISO's proposed reforms answer the Commission's concerns through a framework tailored to the CAISO's distinctive market design and the existing division of responsibility between the CAISO and its PTOs. The CAISO's proposals constitute a major step toward enabling the timely development and interconnection of data centers and other new large loads. The concepts proposed rest on a foundation of highly integrated planning and coordination among the CAISO, PTOs, State energy agencies, and local regulatory authorities, and provide a framework upon which the PTOs will layer their own processes to serve new large loads while upholding and reinforcing the CAISO's commitment to reliability. The proposed reforms strengthen accountability and protect existing customers. They improve transparency, operational visibility, technical standards, cost responsibility, and protection against speculative development.

First, the CAISO and PTO tariff revisions create streamlined paths for large loads to interconnect to the transmission system while preserving the PTOs' lead role in connecting and serving load. Standardized application information, deposits, milestones, study coordination, and service agreements will make the process more transparent and predictable. A large load threshold and enhanced data requirements will give the CAISO and PTOs earlier visibility into a project's size, timing, operating profile, and potential system effects. Coordinated studies, technical standards, telemetry, modeling, ride-through, ramping, power-quality, and other operating requirements will allow the CAISO to

identify and mitigate reliability impacts before service begins and to operate the grid reliably after the load comes online.

Second, the PTOs will implement just and reasonable deposit, security, reimbursement, and cost-recovery provisions in their own tariffs. Milestone and readiness requirements will reduce the risk that speculative projects drive premature investment, and expanded reporting will provide greater transparency into large load requests, study status, projected demand, required upgrades, and cost responsibility. Together, these measures align costs with beneficiaries and cost causers and reduce the risk that abandoned, delayed, or underutilized projects leave other transmission customers paying for facilities built principally to serve a new large load.

Third, the CAISO's tariff revisions close any gaps presented by co-located and behind-the-meter arrangements. The CAISO clarifies their treatment and requires generator interconnection customers to disclose plans to serve co-located load, enabling the CAISO to coordinate its generator studies with the PTOs' load-interconnection review. The framework distinguishes service to load from generator interconnection service, preserves applicable transmission charges and reliability obligations, and allocates upgrade costs based on the facilities and service actually required. These provisions give load and generation developers significant flexibility regardless of their planned configuration. The CAISO also has clarified how developers can submit new interconnection requests or modify existing load or generation sites.

Fourth, the CAISO proposes new service options for flexible large loads that can reduce consumption when transmission capability is unavailable. The CAISO's Flexible Interim Load Interconnection (FILI) can permit earlier energization while network upgrades are pending, enabling the PTOs to provide bespoke solutions to large loads based on their configurations and constraints. Eligibility, study, metering, communications, dispatch, and compliance requirements ensure that flexibility is real and operationally dependable rather than assumed. FILI provides a near-term, prioritized solution for large load developers, with additional work planned on permanent flexibility and other emerging configurations.

Collectively, these tariff revisions will ensure the CAISO tariff remains just and reasonable and not unduly discriminatory or preferential in the face of the challenges the Commission identified in the Order associated with providing the transmission service needed to serve the ongoing influx of large loads while maintaining reliability and affordability.

II. Background

A. Large Loads

The CAISO's work on large loads has unfolded against a rapidly evolving policy landscape. The CAISO's initial focus was to address the most immediate operational challenges that could impact reliability. As the stakeholder initiative progressed, the priorities and expectations of federal and State regulators for large load interconnections continued to develop. Through it all, the CAISO has sought to remain responsive to that evolving direction. The CAISO adjusted the scope and sequencing of its stakeholder process accordingly, while continuing to provide stakeholders a meaningful opportunity to shape the proposals presented in this filing.

In 2025, the CAISO began regular engagement with the PTOs and formed a Large Load Technical Requirements Working Group (LLTRWG) to explore possible technical standards to ensure reliable operations as new large loads interconnect to the CAISO system. The CAISO's Issue Paper, posted in January 2026, described current roles, considerations, and processes for large loads, including transmission and resource planning, transmission service offerings, cost allocation and responsibility, technical requirements and standards, operational requirements, and related issues.[2] The CAISO has continued to monitor and engage in State and federal regulatory discussions regarding large loads and explored central issues and procedural steps that require additional transparency or new products. On June 15, 2026, the CAISO issued a Large Loads Technical Requirements Straw Proposal on behalf of the LLTRWG in order to stay ahead of any potential operational concerns that large loads may present. As NERC's work on large loads ramped up, the LLTRWG focused on responding to NERC alerts and inquiries to help share eventual reliability standards.

On June 18, 2026, the CAISO and PTOs received the Order to Show Cause with the other ISO/RTOs.[3] The CAISO immediately re-scoped its large load stakeholder initiative to work with stakeholders to address each issue in the Order. The CAISO's work included weekly coordination meetings with all of its PTOs, and continuous discussions with local regulators and stakeholders. Several major large load developers participated actively in the CAISO's stakeholder process, including Google, Microsoft, Tesla, and the California Large Energy Consumers Association. The CAISO received written comments on its proposal to address the Order from the following parties: American Clean Power-

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[2] *See* CAISO Large Loads Issue Paper at https://www.caiso.com/documents/issue-paper-large-load-consideration-jan-20-2026.pdf.

[3] *Order Instituting Proceeding Under Section 206 of the Federal Power Act,* 195 FERC ¶ 61,214 (2026) (Order to Show Cause).

California, AltaGas, Antora Energy, Bay Area Municipal Transmission Group, California Community Choice Association, the California Department of Water Resources – State Water Project, the California Large Energy Consumers Association, the CPUC, the Public Advocates Office of the CPUC, the California Solar and Storage Association, Constellation, Google, GridLiance West, IGNIS Energy USA, Independent Energy Producers Association, KritiGrid, Lotus Infrastructure Partners, LS Power Grid California and DesertLink, Microsoft, NextEra Energy Resources, Northern California Power Agency, Pacific Gas and Electric Company, Pattern Energy, Persistence Analytics, Power Applications and Research Systems, San Diego Gas and Electric, the Six Cities,[4] Solar Energy Industries Association, Southern California Edison, State Water Contractors, SunZia Transmission, Tesla, Trimark Associates, Valley Electric Association, Viridon California, and Voltus. These parties and more also participated on the CAISO's public stakeholder calls and tariff development process.[5] Stakeholders overwhelmingly support the CAISO's final proposal as approved by the CAISO Board of Governors.[6]

Independent of this proceeding, the CAISO's work with stakeholders and regulators continues, and with cause for optimism. As described in the CAISO's 30-day informational report on resource sufficiency to serve large loads,[7] current State planning forecasts and procurement trajectories indicate that California can accommodate the large load growth reflected in the adopted demand forecast, provided planned resource additions, procurement and transmission development continue to materialize. As of January 2026, the CEC forecasts that data center load in the CAISO-managed grid will increase by 1.8 GW by 2030 and 4.7 GW by 2035.[8] The CAISO also is aware that utilities are receiving an increasing number of large load interconnection and service applications, and is committed to staying ahead of the curve, with the timely serving of new energy demand reliably and affordably. To date, California's integrated resource planning efforts have resulted in more than 37 GW of nameplate new generation

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4 The cities of Anaheim, Azusa, Banning, Colton, Pasadena, and Riverside, California are CAISO PTOs and metered subsystems (MSS).

5 https://stakeholdercenter.caiso.com/StakeholderInitiatives/Large-loads.

6 https://www.caiso.com/about/governance-committees.

7 *See* Informational Report on Resource Sufficiency at https://www.caiso.com/documents/jul-20-2026-informational-report-large-loads-and-co-located-loads-el26-71.pdf.

8 California Energy Demand 2025 Hourly Forecast – CAISO – Planning Scenario: https://efiling.energy.ca.gov/GetDocument.aspx?tn=268127&DocumentContentId=105135.

and storage capacity coming online to serve CAISO load since 2020.[9] The close coordination between the CAISO, State agencies, and local regulatory authorities on demand forecasts and resource planning provides a pathway for proactive transmission planning that anticipates emerging large load growth by aligning that growth with commensurate resource and infrastructure development to serve new loads. This will enable the CAISO to accommodate growth reliably and affordably.

The CAISO and PTOs coordinated closely throughout the development of their respective proposals. Consistent with their distinct tariff responsibilities and governance processes, each entity developed and submitted its own tariff revisions. The CAISO's proposals are designed to complement the PTOs' filings while preserving the existing allocation of responsibilities.

B. Key CAISO Differences

1. Capacity Requirements

The CAISO's approach to large loads differs from approaches advanced in other ISO/RTO regions because the CAISO does not condition large load interconnection on a requirement to "bring your own generation." Rather than requiring each new large load to develop or procure a matching increment of dedicated generation, California addresses supply adequacy through coordinated long term demand forecasting, integrated resource planning, resource procurement, and transmission planning. These processes are designed to anticipate new demand and develop the resources and delivery infrastructure needed to serve it. Continued generation and storage additions are expected to support forecast load growth, subject to timely procurement and project development. As such, the CAISO currently can accommodate large loads without making each customer's energization and transmission service contingent on completion of a separate generation project. At the same time, the CAISO recognizes that resource sufficiency depends on the realization of planned additions, and large loads may develop faster than forecast or procurement processes anticipate. For this reason, the CAISO continually works with the California energy agencies on forecasting, procurement, and planning.[10] The CAISO will continue assessing whether new loads create incremental reliability risks; however, at this time, a bring-your-own generation requirement is not a condition for interconnection or transmission service.

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[9] *See* CPUC Resource Tracking Data Reports at https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/summer-2021-reliability/tracking-energy-development/cpuc-resource-tracking-data-reports.

[10] The CAISO describes its resource adequacy framework and current load and supply forecasts in the 30-day Informational Report on Resource Sufficiency.

This distinction can remove an important barrier to timely service: a large load customer need not independently secure new generating capacity or satisfy a separate CAISO forward-capacity-market requirement as a condition of interconnection. The CAISO has no centralized forward capacity market; instead, serving load remains subject to the resource adequacy obligations applicable to its load-serving entity (LSE) and the requirements of the relevant local regulatory authority. The absence of a customer-specific generation requirement therefore does not eliminate advance capacity procurement obligations or guarantee immediate service at every location. Large loads must still complete applicable interconnection studies, satisfy technical and operating requirements, and fund or await required facilities and network upgrades. The resulting framework facilitates access to the shared grid without requiring a one-for-one pairing of each new load with new generation, while preserving the planning, procurement, and cost-responsibility safeguards necessary to protect reliability and existing customers. This framework has enabled the construction of many data centers, including those supporting Silicon Valley, for several years.

This distinction also explains why the CAISO does not propose to replicate generation-linked mechanisms developed or proposed in other ISO/RTO regions. Where a large load's access to service depends on identifying sufficient incremental generation, special arrangements may be needed to pair the load with a generating project, coordinate their development schedules, or condition the load's operation on the availability of designated supply. Those arrangements address a constraint that the CAISO's framework does not impose: a large load customer need not sponsor a corresponding generation project to obtain interconnection. Adopting mechanisms whose principal purpose is to satisfy or provide an exception to that requirement would therefore add complexity without removing a comparable barrier to service in the CAISO. The relevant question is not whether another region has adopted a particular innovation, but whether the condition that makes that innovation necessary exists under the CAISO's market and regulatory framework.

The CAISO's proposed reforms in the instant filing instead focus on the constraints that actually govern a large load's ability to interconnect and operate reliably: available transmission capability, timely completion of necessary upgrades, adequate visibility into load characteristics, enforceable operating requirements, and appropriate cost responsibility. A flexible interim interconnection arrangement, for example, can address a transmission bottleneck by allowing earlier energization subject to operating limits while upgrades are completed; it need not also function as a bridge until the customer's dedicated generation enters service. This does not eliminate the serving LSE's resource adequacy obligations or the need to plan and procure sufficient supply. It means that those obligations remain within the existing planning and procurement framework, rather than becoming a separate, customer-specific generation-matching condition layered onto the load

interconnection process. As explained in detail in the CAISO's Informational Report on Resource Sufficiency, the CAISO will continue to assess reliability and capacity needs presented by large load growth with stakeholders, PTOs, LSEs, and State energy agencies.

2. Eligible Customers and Order No. 888

Similarly, the CAISO's framework for providing transmission access differs from the traditional Order No. 888 model. First, the CAISO does not use the "Eligible Customer" construct in any significant way. The very few references to Eligible Customer in the CAISO tariff are merely catch-alls to prescribe that all market participants use a scheduling coordinator to interact with the markets.[11] Second, the CAISO does not offer specific transmission services. As the Commission stated in the Order to Show Cause:

> Unlike other regions, CAISO does not offer traditional Order No. 888 network and point-to-point transmission services, offers no firm, long-term transmission reservations of capacity, and does not provide a formal application process for transmission service. Instead, CAISO offers a single "daily" transmission service that is available to all Eligible Customers on a day-to-day basis. All energy that is transmitted under CAISO's Tariff that is not associated with historical rights or certain wheeling transactions is treated as "new firm use," and those accessing the CAISO-controlled transmission system cannot reserve transmission capacity beyond the day-ahead time frame.[12]

In other words, transmission service is assumed in the sales of energy and ancillary services. Stakeholders agreed with the suggestions in the Commission's Order that large loads do not warrant reforming how the CAISO complies with Order No. 888, which has remained unchanged for 30 years. As such, the CAISO's compliance focuses on achieving the Order's goals without redesigning transmission service or creating a centralized capacity market for the first time in the CAISO. The CAISO's reforms thus provide *interconnection* services to enable large loads to interconnect to the transmission system expeditiously, and without jeopardizing reliability or just and reasonable rates.

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11 *See, e.g.,* Sections 2.1, 4.5.1, 4.5.2.1, 4.5.4.6.1 of the CAISO tariff.

12 Order to Show Cause at P 19.

3. Allocation of Responsibilities

The Commission's Order does not require the CAISO and its PTOs to reallocate their existing responsibilities for interconnecting and serving load.[13] The Commission expressly stated it recognizes that the PTOs are responsible for conducting load interconnection studies, the Commission "appreciate[s] that this role may stem from how CAISO and the Participating Transmission Owners allocated rights and responsibilities in the governing documents establishing CAISO," and that the Commission "do[es] not seek to alter that allocation of rights and responsibilities."[14] Rather than requiring a reallocation of responsibility between the CAISO and PTO tariffs, the Order identifies a need for greater clarity and consistency in the applicable tariffs, including a clear identification of the entity responsible for studying service to large loads. The distinction is important: addressing potential gaps in the governing procedures does not require transferring the load interconnection study function from the PTOs to the CAISO. Stakeholders' preference was for the existing framework to remain in place, with the PTOs administering load interconnection requests and performing the associated studies under their tariffs, coordinated with the CAISO's transmission planning, generator interconnection, and system reliability responsibilities. The necessary reforms can make those complementary roles explicit and improve coordination without centralizing all interconnection functions in the CAISO tariff.

Although the PTOs will conduct load interconnection studies under their tariffs, the CAISO will play a pivotal role as the balancing authority and planning coordinator for the CAISO area in reviewing those studies. Because each PTO studies requests on its own system, the CAISO is uniquely positioned to evaluate study results in the context of the integrated grid, including the transmission facilities of other PTOs, pending generation, and the CAISO's approved transmission plans. In its role, the CAISO will review PTO load interconnection studies to confirm that study assumptions, load characteristics, and results are consistent with the CAISO's planning models and long-term plans. Most importantly, the CAISO will identify any PTO-proposed solution that could create reliability risk, whether because it relies on an operating measure that cannot be dependably implemented, it shifts or exacerbates constraints elsewhere on the system, or it is inconsistent with the CAISO's planning and operational needs.

The same distinction applies to cost responsibility. Preserving the existing allocation of functions allows the PTOs' tariffs to continue to set forth the

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13 *See, e.g.,* Order to Show Cause at PP 37, 40, 51, 86. The CAISO also recognizes that the Order implicates various types of PTOs, including non-load-serving PTOs and approved project sponsors that could be impacted by large load interconnection requests but are not LSEs and do not have retail interconnection tariffs. The CAISO expects the PTOs to work together to clarify and develop complementary roles and responsibilities in their respective tariffs regarding requests for interconnections to non-load-serving PTO facilities.

14 *Id.* at P 51.

applicable rules for assigning and recovering the costs of facilities needed to interconnect and serve large loads. The CAISO, meanwhile, retains independent responsibility for evaluating systemwide reliability, transmission planning, and operational consequences. The CAISO, PTOs, and stakeholders believe this is the prudent approach because many of the PTOs have a direct relationship with their retail ratepayers and the regulators of those ultimate rates, including the CPUC. Likewise, it is the PTOs that will construct and own the network upgrades if required for the large load interconnection. As such, the CAISO does not propose to issue a new "top-down" cost allocation solution through its own tariff. The CAISO believes that the PTOs may develop their own proposals to address any cost shifting concerns raised in the Order, and that the current transmission revenue requirement and credit mechanisms in the transmission access charges can accommodate those proposals.

The PTOs worked in good faith to establish consistent cost allocation rules in their tariffs; however, there is little case law or Commission precedent to guide what constitutes just and reasonable rates for large loads specifically. Such precedent will likely come from these responses to the Order to Show Cause, offering greater regulatory certainty in the future. If the Commission requires additional tariff provisions or greater uniformity, the CAISO is prepared to work with the PTOs and stakeholders to develop an appropriate response consistent with the existing allocation of responsibilities.

4. Non-jurisdictional Transmission Owners

The Order was directed to the CAISO and all its PTOs; however, the Order stated that if a non-public utility wished to be removed from the proceeding, the Commission would rescind the Order against them. In such a case, the Commission "expected CAISO to respond to this order regarding the non-public utility's CAISO tariff provisions on file with the Commission."[15] Based on this direction, the CAISO's non-public utilities requested the Commission rescind the Order, which the Commission granted.[16] Importantly, these PTOs explained that their exits from the proceeding were not simply a legal issue, but that these PTOs were generally unlikely to receive large load interconnection requests, and as such, did not require tariff revisions. Morongo Transmission, for example, explained that it is a non-load-serving PTO, and has no end users. The Six Cities similarly explained that their facilities and transmission entitlements in the CAISO generally represent shares of jointly-owned facilities with other transmission

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15 Order to Show Cause at P 2 n. 9.

16 Specifically, the Cities of Anaheim, Azusa, Banning, Colton, Pasadena, and Riverside, California (Six Cities); and Western Area Power Administration (WAPA). Morongo Transmission—wholly owned by the Morongo Band of Mission Indians, a federally recognized American Indian Tribe exercising jurisdiction over the Morongo Indian Reservation—also filed for rescission on August 12, 2026.

owners. WAPA likewise explained only a portion of its Path 15 line, between two PG&E substations, is under the CAISO's operational control.

The CAISO thus believes that its tariff revisions, combined with the anticipated tariff revisions of the other PTOs in this proceeding, satisfy the Order. Together, they will cover the transmission lines and substations in the CAISO where large loads will interconnect to the transmission system.

III. Tariff Revisions and Order to Show Cause

Although the CAISO believes the tariff revisions in this filing do not substantially affect Order Nos. 888, 1000, 2003, 792, 845, 2023, or 1920 policies, the CAISO's proposed tariff revisions meet both the just and reasonable standard and the independent entity standard. The tariff revisions address issues unique to the CAISO, and were generally designed to work without significant conflict with the CAISO's tariff provisions modeled on the Commission's *pro forma* Open Access Transmission Tariff and Large Generator Interconnection Procedures. The proposed tariff revisions build upon the CAISO tariff with independent entity variations previously accepted by the Commission.

A. Transmission Service to Eligible Customers on Behalf of Large Loads

1. Definition and Applicability

The Commission noted in the Order that the CAISO and PTO tariffs lack a definition of large load as a new category of load.[17] The Commission directed the CAISO and PTOs to create an appropriate definition, including a load size and interconnection voltage threshold, based on the characteristics of CAISO's transmission system. The Commission suggested that a potentially reasonable definition would be Southwest Power Pool's (SPP) definition of "a new commercial or industrial customer, located at a single site behind one or more points of interconnection, and that has a peak load of 50 MW or greater, interconnects to the transmission system at a voltage level of greater than 69 kV, and is not part of a co-location arrangement."[18]

The CAISO proposes to define a Large Load as "An End User located at a single site behind one or more points of interconnection to the CAISO Controlled Grid, and that has a peak load of 50 MW or greater."[19] The CAISO believes this

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17 Order to Show Cause at P 58.

18 *Id.* at P 57.

19 Proposed Appendix A to the CAISO tariff. The CAISO tariff defines an End User as "A consumer of electric power who consumes such power to satisfy a Load directly connected to the

definition satisfies the Order's intent, creates a clear and easy-to-understand class of loads in the CAISO, and avoids infringing on State jurisdiction. Although the words in the CAISO's proposed definition are different than the Commission's proposed definition, the CAISO believes those differences are valuable, as explained below. The CAISO also notes that its proposed definition is similar to the proposed definition the Commission recently approved in the PJM Interconnection.[20]

The CAISO proposes not to include a description of the types of load (*i.e.*, commercial or industrial customer) in its definition of Large Load. Unless there is a relevant operational difference between the types of loads, the CAISO believes that specifying type is unnecessary. The CAISO also wants to avoid a definition that results in false positives, false negatives, or disputes about what constitutes "commercial" or "industrial."[21] In the future, type-based terms may be necessary for different reliability rules, especially as NERC finalizes its standards for computational loads. But the CAISO has elected not to specify any type at this time.

Similar to generator interconnections, the CAISO proposes to continue to adhere to FERC and California regulations on what constitutes a "site," and thus does not propose defining "site" in its definition. The CAISO believes the large load definition will adequately apply to large loads comprised of distinct loads even if they have separate retail meters. Operationally, such loads would still have the same impact on the CAISO transmission system. Moreover, the prevalence of behind-the-meter and hybrid configurations in the CAISO has led the CPUC and local regulators to address multi-meter and multi-unit sites. The CAISO also does not believe that the CAISO tariff is the proper vehicle to define a site. In the event of a unique configuration, Commission precedent and local regulations are more than sufficient in the large load context.[22] Further, under its

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CAISO Controlled Grid, a Distribution System, or, for purposes of scheduling and operating the Day-Ahead Market only, the transmission system of an EDAM Transmission Service Provider who does not resell the power, or, for purposes of scheduling and operating the Real-Time Market only, the transmission system of an EIM Transmission Service Provider and who does not resell the power." The CAISO tariff defines the CAISO Controlled Grid as "The system of transmission lines and associated facilities of the Participating TOs that have been placed under the CAISO's Operational Control."

The CAISO purposely did not capitalize point of interconnection because its tariff definition is designed for generating facilities, whereas the point of interconnection for a large load will be determined by the retail interconnection agreement consistent with local regulatory authority rules. As with many aspects of this definition, the CAISO's intent is to remain flexible for this new set of rules so as to avoid false positives and false negatives.

20 *PJM Interconnection*, 197 FERC ¶ 61,019 at P 16 (2026).

21 Nor does the CAISO want to compound the issue by formally defining those terms.

22 *Id*.

current rules as planning coordinator and balancing authority, the CAISO will continue to study impacts to the transmission system of any large load that connects to the distribution system or load that falls below the 50 MW peak load threshold but connects to the transmission system. The CAISO will similarly continue to work with NERC and other regulators to address smaller and distributed loads in the future.

The CAISO's proposed definition of Large Load also omits a specific voltage level for the interconnection. The CAISO does not believe this is necessary where the definition specifies the interconnection is to the "CAISO Controlled Grid," a term that already requires evaluation under all Commission tests for transmission vs. distribution, including voltage. The CAISO's proposed definition thus establishes that the large load is transmission-connected, obviating the need to specify a voltage that could conflict with the existing transmission registration. Although distribution-grid voltages likely make interconnection difficult for large loads, the CAISO recognizes that it could be possible for 50 MW loads to interconnect to the distribution grid. Nevertheless, the CAISO is focused on transmission-connected large loads at this time because they are the subject of FERC's Order, and because the transmission grid represents the likely interconnection point for the vast majority of large loads. The CAISO recognizes, however, that the Order represents the frontier of Commission jurisdiction, and there is little precedent to better understand how a large load definition and accompanying rules will operate consistent with the Federal Power Act. The CAISO has created its definition recognizing that it does not have a centralized capacity market for all loads, and that the Commission has stressed avoiding infringement on the States' jurisdiction over retail service and distribution.

The CAISO's proposed definition of Large Load also does not include FERC's proposal that the definition specify that the large load "is not part of a co-location arrangement." The CAISO does not believe it is necessary to exclude large loads participating in co-location arrangements from the *definition* of large loads. Although such loads will be subject to different tariff provisions than standalone large loads, they would still constitute large loads.

Finally, the CAISO does not propose to include the term "new" in its Large Load definition because that term also would require specification. Instead, the CAISO proposes to include in the definition and the tariff a general provision stating that the CAISO will not consider any load a large load subject to the CAISO tariff where the load is operational or has a complete request with the PTO before the CAISO tariff revisions' effective date of February 16, 2027.[23] This

[23] Proposed Section 25.7 of the CAISO tariff. The CAISO has requested a later effective date for two sets of technology-related changes, but this should not impact studies. *See* Section VI, below.

provision will avoid retroactive ratemaking on existing loads, and ensure the CAISO's proposed tariff revisions do not affect existing commercial arrangements. The CAISO also proposes to include a provision stating that if a grandfathered load increases or modifies its load pursuant to a PTO tariff after the effective date, the load would become a large load and subject to those tariff requirements. This approach is similar to those proposed by other ISO/RTOs for large loads, and previous generator interconnection rule changes approved by the Commission.[24] It ensures that existing loads are grandfathered as they are, but without license to evolve without operating under the same rules as other large loads. The CAISO's proposed tariff revisions also recognize that the PTOs are the first and primary referees of which loads will be "large loads." The PTOs will receive the initial energization requests from new loads or modification requests from existing loads, and have far more experience with load interconnection requests than the CAISO. As such, the CAISO purposely defers to their tariffs as the proper place to establish criteria for any grandfathered loads to become large loads consistent with the filed rate doctrine.

Although the CAISO proposes to create a tariff class for large loads, the CAISO does not propose to create any new market participation models for large loads at this time.[25] Rather, the CAISO proposes to enable large loads to participate (1) simply as typical end users, represented by an LSE, or (2) through any existing CAISO participation model, including, for example, proxy demand resources, reliability demand response resources, participating loads, or non-generator resources.[26] Large loads participating in the CAISO markets would then be eligible for all rights and subject to all obligations of the CAISO tariff under those participation models. For example, a large load that desires to participate as a reliability demand response resource could simply adhere to the tariff provisions for reliability demand response resources, just as any other end user.[27] Large loads may participate alone or in permissible aggregations, including with co-located generating units.[28] Likewise, the CAISO proposes to include tariff provisions stating that large loads are eligible to provide, without limitation, demand response energy, curtailable demand, resource adequacy capacity, and ancillary services consistent with their participation model and

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24 *See, e.g.,* Section 25.4.2 of the CAISO tariff (applying asynchronous generating facility technical requirements "to the extent the Generating Facility makes modifications that replace its Generating Unit(s) or any inverter(s)").

25 As explained below, the CAISO believes it has several existing market participation models large loads can use, and plans to explore new, tailored models in stakeholder initiatives in 2027.

26 Proposed Section 4.19 of the CAISO tariff.

27 Section 4.13 of the CAISO tariff. (The large load would still also be required to comply with all tariff provisions regarding large loads.)

28 *Id*.

subject to the requirements of the CAISO tariff.[29] Instead of trying to create a bespoke model for large loads, the CAISO's proposed framework enables developers to choose what model will work best for them based on their configuration and business model. Any large load that elects to participate in the CAISO markets can do so on day one through existing participation models.[30]

2. Large Load Interconnection Study Procedures

The Order highlighted a lack of clarity and consistency regarding the study of the provision of transmission service to eligible customers on behalf of large loads interconnecting to the transmission system.[31] Further, the Commission noted that, while it does not seek to alter the allocation of rights and responsibilities between the CAISO and PTO tariffs, the CAISO and PTO tariffs may not clearly specify which entity will be responsible for studying the provision of transmission service to eligible customers on behalf of large loads.[32] The Order suggested that additional study considerations may be necessary to address the unique operational and reliability challenges presented to the transmission system by providing transmission service to eligible customers on behalf of large loads.[33] The Commission noted that clear and consistent study processes may be necessary to fully capture the transmission system impacts of providing such transmission service, which could result in significant operational risks for the transmission system,[34] and suggested that tariff provisions may prevent disputes over a variety of issues, *e.g.*, study timelines and delays, how the transmission service needed on behalf of the large load is studied, what types of network upgrades are considered, and how required network upgrades to provide the requested transmission service are determined.[35] Finally, the Commission suggested that the CAISO and PTO tariffs may fail to deter speculative or duplicative requests for transmission service by eligible customers on behalf of large loads.[36]

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29 Proposed Section 4.19 of the CAISO tariff.

30 In fact, any load can do the same today, hence the CAISO's inclusion of "Large Loads *and Loads*" in proposed Section 4.19 of the CAISO tariff. The CAISO included such language to avoid the implication that only large loads could avail themselves of such rights, even though loads participate significantly in the CAISO markets today.

31 Order to Show Cause at P 51.

32 *Id*. at P 51.

33 *Id*. at P 52.

34 *Id*. at P 53.

35 *Id.* at P 54.

36 *Id.* at P 55.

As explained in the Order[37] and Section II.B.3, above, the PTOs receive and perform the load interconnection studies today. The CAISO and PTOs do not propose to change this division of responsibility: The PTOs will therefore respond to the Order's findings in their PTO filings. The CAISO expects the PTOs to develop consistent study procedures to be completed within 60 to 90 days, as required by the Commission. The CAISO also expects the PTOs to address network upgrade considerations and deterring speculative requests. For clarity, the CAISO proposes tariff revisions noting that end users, including large loads, interconnect to the CAISO controlled grid pursuant to PTO and retail tariffs.[38] The CAISO also proposes tariff revisions stating that the CAISO will coordinate with the PTOs and any affected systems to account for large load interconnections to the CAISO in all interconnection studies.[39] Consistent with the CAISO's interconnection procedures and the PTO tariffs, the CAISO and PTOs will identify network upgrades and interconnection facilities best reflecting the combined topology of generating facility and large load interconnections.[40]

The PTOs will thus conduct load interconnection studies under their tariffs, and the CAISO will review those studies. As planning coordinator and balancing authority,[41] the CAISO will review PTO load interconnection studies to confirm that study assumptions, load characteristics, and results are consistent with the CAISO's planning models and long-term plans.[42] Most importantly, the CAISO will identify any PTO-proposed solution that could create reliability risk, whether because it relies on an operating measure that cannot be dependably implemented, it shifts or exacerbates constraints elsewhere on the system, or it is inconsistent with the CAISO's planning and operational needs. The CAISO will conduct this process on a monthly basis to ensure the CAISO's review does not affect the PTOs' obligations to complete their studies within 90 days.[43] Where the CAISO identifies a risk, it will work with the PTO to develop an alternative, such as a different network upgrade, an alternative transmission technology, or

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37 *Id*. at P 51.

38 Proposed Section 25.7 of the CAISO tariff. The CAISO tariff also notes that end users do so consistent with local regulatory authority requirements.

39 *Id*.

40 *Id*. This provision is included for general compliance. Specific co-located load and generating facility interconnection study obligations are discussed in Section III.C, below.

41 The CAISO also maintains the base cases, transmission plans, and generator interconnection queues.

42 Proposed Section 25.7 of the CAISO tariff. To avoid the implication that the CAISO reviews transmission upgrades for large loads only, the CAISO has included "Loads and Large Loads" in this provision. This is consistent with the CAISO's *status quo* planning coordinator responsibilities to review all transmission upgrades.

43 *Id*.

modified operating limits, so that the large load can interconnect without compromising reliability. This review complements, rather than replaces, the PTOs' lead role in studying and serving load, and ensures that solutions developed at the local level are reliable and coordinated with the broader system. The CAISO also proposes to memorialize in the tariff that the CAISO's transmission planning process will consider large load growth and any transmission upgrades planned as transmission solutions for public policies selected for consideration under Order No. 1000 processes.[44]

The CAISO also proposes to implement new data requirements for large load interconnection requests and associated cost data. The CAISO discusses these proposals in Section III.B.2, below.

3. Large Load Application Process

The Order suggested that the CAISO and PTOs lack clear and consistent provisions establishing the application process and study procedures that will be used when the CAISO and/or the PTOs evaluate the provision of transmission service on behalf of large loads, including an application process, application fee and readiness requirements, and information and data requirements.[45] The Order also suggested that the CAISO and PTO tariffs lack appropriate study provisions to recognize the unique operational characteristics of large loads that are willing and able to limit their energy withdrawals under certain conditions to lessen or avoid the need for network upgrades.[46] In addition, the Commission noted that accurate models using Electromagnetic Transient (EMT) studies may help to ensure that transmission service needed on behalf of large loads can be provided without compromising reliability and suggests clarity and consistency in the evaluation of alternative transmission technologies (ATTs) as potential solutions to accommodate an eligible customer's request for transmission service on behalf of a large load.[47] To the extent that traditional network upgrades are selected over ATTs, the Commission recommended demonstration of why ATTs were not selected.[48] The Commission directed the CAISO and PTOs to explain whether their tariffs sufficiently address identification of Direct Assignment Facilities and Network Upgrades (as the Order defines) necessary to reliably

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44 Again, this already occurs where the transmission planning process identifies reliability-based transmission solutions and policy-driven transmission solutions, but pursuant to the intent of the Order, the CAISO is highlighting it for large loads to increase transparency. As the CAISO detailed in its 30-day informational report on resource sufficiency, the CAISO, CEC, and CPUC all break out large loads specifically in forecasts and planning scenarios.

45 Order to Show Cause at P 58.

46 *Id.* at P 59.

47 *Id.* (Also known as Grid Enhancing Technologies or GETs).

48 *Id.* at PP 60-61.

provide transmission service to eligible customers on behalf of large loads; include provisions for a 60-to 90-day timeline to study the unique operational characteristics of large loads; and include a study deadline to assess large loads.[49]

The CAISO reiterates that the existing load interconnection process is conducted by the PTOs. For this reason, the CAISO proposes enhanced and ongoing coordination with the PTOs on the load and resource interconnection processes and expects the PTOs to align their load application processes with the CAISO's resource interconnection process to ensure the level of visibility necessary for the CAISO to plan for new large loads and maintain reliability once they are interconnected. The CAISO proposes including general provisions explaining this coordination, as discussed in Section III.A.2, above. The CAISO also notes that existing load and generator interconnection study procedures already include ample processes to detect potential impacts on affected systems and multiple affected PTOs, and those processes will apply to large loads.[50] The CAISO expects that the PTOs will address the other interconnection process issues in their respective filings.

The CAISO understands that transmission providers must consider ATTs at all times. The CAISO currently evaluates ATTs in its transmission planning process and generator interconnection process. The CAISO's evaluation includes static synchronous compensators, static VAR compensators, advanced power flow control devices, transmission switching, synchronous condensers, voltage source converters, advanced conductors, and tower lifting. Further, the CAISO is expanding its economic consideration of dynamic line ratings to mitigate congestion. As a transmission provider, the CAISO must include in the generator interconnection cluster study report an explanation of the results of the evaluation of the enumerated ATTs for feasibility, cost, and time savings as an alternative to a traditional network upgrade. Therefore, the CAISO supports and has broadly adopted the practice of duly considering and assigning ATTs to meet identified system needs, including when triggered by new loads interconnecting to the CAISO grid. The CAISO also documents consideration of such technologies in its annual Transmission Plan. This has been the practice in CAISO for several years and was recently memorialized in the CAISO's tariff in compliance with FERC Order Nos. 2023 and 1920 (pending FERC approval).[51] To respond to the Order and the large load interconnection context specifically, the CAISO proposes to clarify these considerations through consistent language in the CAISO tariff, which the CAISO expects the PTOs will similarly include in

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49 *Id*. at P 62.

50 *See* proposed Section 25.7 of the CAISO tariff; Section 3.7 of Appendix KK to the CAISO tariff.

51 *See, e.g.*, Section 6.2 of Appendix KK to the CAISO tariff.

their tariffs.[52] The CAISO will continue to set out the alternatives that were considered in the selection of all preferred transmission solutions, whether ATTs or other more conventional solutions, to the reasonable depth necessary given the nature of the transmission need. This approach has worked well in the generator interconnection study process, enabling the consideration and use of ATTs without slowing down studies.

With regard to the Commission's ATTs-related modeling concerns, the CAISO coordinates annually with the transmission owners during the transmission planning process on the feasibility of ATTs, particularly evaluating the application of advanced conductors and flow control devices. The CAISO also expects that both the CAISO and the PTOs will be advancing their EMT-related studies, and expects that the PTO tariffs will address the timely provision of EMT models in the large load application process.

4. Operational Requirements

The Commission preliminarily found in the Order that the CAISO and PTO tariffs appear to be unjust and unreasonable because they lack provisions addressing ongoing operational requirements for eligible customers taking transmission service on behalf of large loads.[53] The Commission enumerated specific examples, including the lack of provisions governing hourly forecasts, telemetry data, and equipment to enable the CAISO to monitor large loads.[54] The Commission also suggested the CAISO should impose requirements to remotely disconnect large loads when necessary to maintain reliability; ramp rate or ride-through requirements; and control technologies and/or protection systems that may be necessary to limit withdrawals from the transmission system.[55]

The CAISO agrees that the operational requirements the Commission identifies in the Order are necessary. The CAISO has been exploring these issues through discussions with PTO representatives in the LLTRWG, CPUC workshops, an industry Expert Working Group (EWG), and through engagement with NERC. The LLTRWG was established by the CAISO and utilities interconnecting large loads to develop consistent technical requirements for the reliable interconnection and operation of large data center loads connected to the CAISO controlled grid. The EWG was likewise formed to gain collaborative feedback from diverse industry representatives focused on developing a

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52 Proposed Sections 24.1 and 24.3.1 of the CAISO tariff. For co-located generating units and large loads, the CAISO and PTOs are already obligated to evaluate ATTs/GETs by Section 6.2 of Appendix KK to the CAISO tariff.

53 Order to Show Cause at P 63.

54 *Id*.

55 *Id*.

coordination framework and functional model that advances opportunities in Transmission and Distribution coordination, including large loads, while maintaining current roles and responsibilities. As detailed at length in the LLTRWG proposal, the LLTRWG developed its operational requirements after broadly surveying operational requirements developed by other utilities with large loads.[56] This process ensures that the CAISO's operational requirements will be consistent with national requirements, and thus easier and less expensive to implement for developers. The CAISO also put its proposed operational requirements to stakeholders in the general large load initiative, where stakeholders supported the proposals.

To maintain reliability, the CAISO proposes several new requirements regarding large loads. Because many large loads may not be directly subject to the CAISO tariff,[57] the CAISO's proposed requirements place the onus of responsibility on the PTOs and LSEs.

Prior to the interconnection of any large load to the CAISO controlled grid, the CAISO proposes to require the PTO to provide the CAISO with the following information for the large load: Load type, variable or flat load designation, expected hourly operating profile, points of interconnection and withdrawal, MW capacity, minimum and maximum operating levels, expected CAISO market participation model (if any), curtailment and ramping capabilities, and behind-the-meter generation capacity and characteristics (if any).[58] This will provide the CAISO with the necessary information to assess any operational impact before energization. The CAISO also proposes to require the PTO to ensure the large load has continuous dynamic disturbance recording data and storage on the high-side of the main power transformer or common point of connection to determine the following electrical quantities for the large load: (1) Phase-to-neutral voltage for each phase, (2) each phase current and the residual or neutral current, (3) real power and reactive power flows expressed on a three-phase basis corresponding to all circuits where current measurements are required; and (4) frequency.[59] This requirement will ensure adequate reliability data for each large load. The CAISO also proposes to require each PTO to ensure it can

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56 Included as Attachment D to this filing, and available at https://www.caiso.com/documents/jul-20-2026-informational-report-large-loads-and-co-located-loads-el26-71.pdf.

57 In other words, many large loads may interconnect subject to a PTO tariff alone. As such, the CAISO may not always have contractual privity to subject large loads to its requirements or enforce reliability provisions. As such, the CAISO's compliance obligations are directed toward the PTOs and LSEs already subject (or unavoidably subject) to the CAISO tariff. They can then enforce the CAISO tariff requirements through their tariffs, agreements, or procedures.

58 Proposed Section 25.7.1 of the CAISO tariff.

59 *Id*.

disconnect or otherwise isolate the large load in the event of a contingency, imminent, or actual system emergency, to maintain system reliability.[60]

The CAISO also proposes to require each PTO to impose ride-through requirements for large loads to remain electrically connected during certain frequency[61] and voltage disturbances.[62] Similar to generating facility requirements,[63] these rules provide the severity and length of disturbance in which a large load may or may not trip. All requirements were based on the work by NERC, regional entities, and utilities facing large load disturbances.[64] The CAISO also has included a general tariff provision stating that a load shedding program or remedial action scheme directed or required by the CAISO or PTO takes precedence over these ride-through requirements.[65] This provision avoids any ambiguity over potentially conflicting ride-through/trip directions.

The CAISO also proposes to require each PTO to impose ramp-rate limitations in active power consumption during normal operation, start-up, shutdown, and restoration processes.[66] The average active power ramp rate, measured at the point of interconnection over a rolling ten (10)-minute interval, should not exceed twenty (20) megawatts per minute (MW/min), applying to both increases and decreases in active power consumption. This ramp-rate limitation does not apply to the immediate post-disturbance recovery of active power consumption following a system fault or voltage disturbance. The PTO also will require each large load to restore its active power consumption following a system fault or voltage disturbance to at least 90 percent of its pre-disturbance active power consumption within three seconds after the post-fault voltage at the point of interconnection recovers to at least 0.90 pu.[67] Additionally, the CAISO has included a general requirement that after a disturbance or other reliability event involving a large load, the large load, any associated interconnection customer, scheduling coordinator, and PTO must comply with any CAISO, regional entity (i.e., WECC), or Reliability Coordinator data request related to the event.[68] This is already the case today, but the CAISO believes a specific tariff

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60 *Id*.

61 Proposed Section 25.7.1.1 of the CAISO tariff.

62 Proposed Section 25.7.1.2 of the CAISO tariff.

63 Attachment H to Appendix LL to the CAISO tariff.

64 *See* Attachment D to this filing.

65 This would include programs or remedial action schemes designed to facilitate FILI as well.

66 Proposed Section 25.7.1.4 of the CAISO tariff.

67 Proposed Section 25.7.1.3 of the CAISO tariff.

68 Proposed Section 25.7.4 of the CAISO tariff.

provision for large loads provides greater transparency. This transparency will ensure parties involved in a reliability event continue to provide data to help understand the event and prevent future issues.

The CAISO's remaining operational requirements apply to the scheduling coordinator representing the large load's demand. For each large load, the scheduling coordinator must provide the CAISO:

1. Daily and hourly forecast data otherwise required for the CAISO demand forecast;
2. Any real-time, material deviations from provided forecasts, including changes resulting from energization activities, material operational changes, curtailments, outages, derates, operating limits, operating envelopes, or co-located generation impacts that materially affect expected demand;
3. The forecasts are expected to reflect the resource's anticipated operating capability, including planned outages or derates that materially affect the large load's expected consumption or operating capability; and
4. Operational status and real-time consumption in accordance with the CAISO's standards for direct telemetry and consistent with CAISO telemetry requirements.[69]

These data requirements will ensure the CAISO has day-ahead and real-time information sufficient to manage reliability risks from large load demand swings. For those not participating through a market model, demand forecasting and settlement will remain at the LSE level, and the CAISO will have specific data inputs to understand the behavior of those large loads that could impact reliability.

Based on stakeholder feedback, the CAISO believes most large loads will elect not to participate directly in the CAISO markets, and will simply be represented by their LSE like conventional loads today. Nevertheless, the CAISO proposes to include tariff language stating that large loads may elect to participate in the CAISO markets directly, including as stand-alone loads or in aggregation with other resources.[70] Large loads also may elect to participate as their own LSE, a non-generator resource, or a participating load, if they qualify for those models under CAISO tariff and local regulatory authority

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69 Proposed Section 25.7.3 of the CAISO tariff. The CAISO notes that its telemetry requirements are tailored to coordinate with local regulatory authority standards and nationally available telemetry technologies.

70 Proposed Section 25.7.3.1 of the CAISO tariff.

requirements.[71] Such large loads could then elect to comply with the CAISO tariff operational requirements and participate in the CAISO markets through their own scheduling coordinator in lieu of their LSE scheduling coordinator. However, the CAISO has included a qualification that any such direct participation must be consistent with local regulatory authority requirements.[72]

Additionally, the CAISO proposes to include a qualification that the applicable LSE, utility distribution company, MSS operator, large load, and scheduling coordinator may satisfy the operational requirements through coordinated arrangements that clearly assign each CAISO tariff obligation and avoid duplicative submissions.[73] The applicable arrangement must identify the scheduling coordinator responsible for submitting bids, scheduled demand, meter data, forecasts, and real-time operational updates for the large load. The CAISO also must verify the arrangement will comply with the tariff before its use. This provision recognizes that these are novel operational requirements, and developers have varying needs based on their configuration and location. It is in everyone's interest for the CAISO to provide flexibility to enable large loads and their counterparts to identify the best compliance practices. As such, the CAISO believes this tariff provision will provide significant value without sacrificing reliability.

5. Large Load Service Agreements

The Commission preliminarily found in the Order that the CAISO and PTO tariffs lack *pro forma* provisions in a transmission service agreement, or other applicable agreement, to memorialize the technical and operational terms the Order describes.[74]

The PTOs will propose consistent *pro forma* agreements to memorialize the technical and operational terms the Order describes. At this time, the CAISO and stakeholders do not believe the CAISO should always be a signatory to a three-party agreement for large load interconnections, especially where the large

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71 In other words, this provision would not operate to make a large load an LSE or participating load unless the large load meets the tariff definition and requirements for those entities. This provision is intended to encompass rare cases where certain loads participate directly in the CAISO markets. The CAISO also notes that although a large load also could participate in a demand response program, it would still require an LSE to account for its general demand (in addition to demand response provider managing the demand response participation).

72 For example, the CAISO tariff requires the State or local regulatory authority to allow any end user to be an LSE or a Participating Load. *See* "Load Serving Entity," Appendix A to the CAISO tariff; Appendix B.4 of the CAISO tariff.

73 Proposed Section 25.7.3 of the CAISO tariff.

74 Order to Show Cause at P 64.

load is not taking FILI service or participating in the CAISO markets.[75] The large load developer and PTO can negotiate the terms of construction and cost rules, while the CAISO would not require any rights or obligations. Rather, such arrangements will be effectuated through a two-party interconnection agreement between the PTO and the large load developer, as performed today.[76] For a large load requesting FILI service, the PTO will need the CAISO to help memorialize and agree to the operational procedures necessary to provide that service through new service agreements or having the CAISO co-sign the PTO's interconnection agreement.

For co-located large loads with exporting generation, likewise, the CAISO will need to be a party to a *pro forma* agreement that bridges the *pro forma* Large Generator Interconnection Agreement (LGIA) with the *pro forma* large load interconnection agreement or negotiate a non-conforming LGIA to account for certain details of the co-located large load interconnection on an individual basis. The developer also will need to execute a CAISO *pro forma* Participating Generator Agreement for the generator, but not a Participating Load Agreement for the large load.[77]

B. Cost Shifting Risk among Transmission Customers

1. Cost Allocation Rules and Agreements

In the Order, the Commission laid out key objectives regarding cost allocation of infrastructure needs attributable to eligible customers taking transmission service on behalf of large loads: improved transparency regarding the assignment of network upgrades and their associated costs; and development of a *pro forma* cost recovery agreement between the CAISO, the relevant PTO, and the eligible customer taking transmission service on behalf of large loads. The Commission stated that improved transparency would provide important information to State public utility commissions and other State regulators, enabling them to identify which transmission costs are caused by which transmission customers to appropriately sub-allocate costs at the retail level. According to the Commission, a *pro forma* cost recovery agreement would ensure that eligible customers bear the risk and are ultimately responsible for the costs incurred to provide transmission service, including the cost of network upgrades.

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75 For example, the CAISO likely will not have any roles or responsibilities for the financing and construction of simple network upgrades needed for large loads receiving firm interconnection service.

76 The CAISO describes the elements required for a three-party agreement for FILI in Section III.D, below.

77 Unless it will participate as a Participating Load, in which case it would. *See* Proposed Section 4.19 of the CAISO tariff.

The CAISO shares the objectives of the Order to prevent cost shifting among transmission customers and to ensure that large loads equitably bear risk and responsibility for costs incurred to interconnect, including the cost of network upgrades attributed to the large loads. The CAISO understands the importance of maintaining affordability while addressing large load integration. The CAISO expects that in addressing cost shifting concerns, the PTOs will address the collateral issues regarding financial security, revenue stability, and adequate exit provisions for large loads. As explained in Section II.B.3, above, the CAISO believes it is prudent for cost allocation rules to be set forth in the PTO tariffs rather than the CAISO tariff. The PTOs will continue to manage large load interconnections through their tariffs. Many of the PTOs also have a direct relationship with their retail ratepayers and the regulators of those ultimate rates, including the CPUC. Additionally, it is the PTOs that will construct and own the network upgrades if required for the large load interconnection. As such, the CAISO does not propose to issue a new "top-down" cost allocation solution through its own tariff. The CAISO believes that the PTOs may develop their own proposals to address any cost shifting, and that the current transmission revenue requirement and credit mechanisms in the transmission access charges can accommodate those proposals.[78] The CAISO proposes some metering and settlement changes in Section III.C.2 to account for co-located large loads and generation.

2. Data Transparency

In the Order, the Commission highlighted the need for "the provision of data on CAISO's website in a single location, and in an easily accessible format that is searchable and allows users to filter the data, on transmission service provided to eligible customers on behalf of large loads, for network upgrades evaluated in the local transmission planning process that are needed to accommodate transmission service to eligible customers on behalf of those large loads, and the costs for those network upgrades."[79]

The CAISO agrees that cost data should be transparent and can be provided on the CAISO website in a searchable format. This is important both to aid large load developers in making efficient siting decisions as well as to provide information critical for State regulators to ensure fair cost allocation at the retail level. For large load developers, the CAISO notes that for the interconnection study process, the CAISO already provides each PTO's per unit cost guide for all

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78 The CAISO notes that the orders to show cause represent largely novel issues: There is little case law to guide what constitutes just and reasonable rates for large loads specifically. Such precedent will likely come from these responses to the Orders to Show Cause, offering greater guidance for future enhancements.

79 Order to Show Cause at P 46.

network upgrade cost components.[80] These guides are updated and shared with stakeholders annually based on the latest industry cost estimates. As such, the CAISO believes its tariff provides detailed, transparent, up-to-date cost information on potential costs for transmission network upgrades.

For State regulators and stakeholders, per the Commission's direction,[81] the CAISO also proposes to clarify in the transmission planning process where network upgrades were needed to accommodate both general load growth and large load interconnection specifically. Large load growth has already been incorporated into the CEC, CPUC, and CAISO forecasting and planning processes, as detailed in the CAISO's informational report on resource sufficiency already submitted to the Commission.[82] The CAISO also proposes to publicly post:[83]

1. Aggregate amounts of proposed large load additions in the CAISO operating area, including the aggregate amounts in each transmission pricing zone;
2. Planned network upgrades needed to accommodate eligible customers taking transmission service on behalf of large loads, identified by type of equipment and network upgrade (*e.g.*, new substation, reconductoring, a new high-voltage transmission line) for each transmission service request; and
3. Cost estimates for each planned network upgrade identified as needed for large loads, as described in (2).[84]

The CAISO proposes to memorialize these transparency requirements in its tariff. The CAISO also has encouraged the PTOs to memorialize tariff requirements to adopt large load queue spreadsheets as they do for wholesale generator interconnection customers. The CAISO likewise proposes to include in its generator interconnection queue report whether the interconnection customer proposes to include a large load, and its capacity.[85]

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80 *See* CAISO current cost guides at https://www.caiso.com/library/current-cost-guides.

81 Order to Show Cause at PP 70-72.

82 *See* CAISO Informational Report on resource sufficiency at https://www.caiso.com/documents/jul-20-2026-informational-report-large-loads-and-co-located-loads-el26-71.pdf.

83 Proposed Sections 24.3.1 and 24.19.1 of the CAISO tariff, and proposed Section 3.6 of Appendix KK to the CAISO tariff.

84 Order to Show Cause at P 75.

85 *See* CAISO Generator interconnection at https://www.caiso.com/generation-transmission/generation/generator-interconnection.

C. Co-Location Arrangements and Load with Behind the Meter Generation

1. Co-located Interconnection Studies

The Commission stated in the Order that the CAISO's tariff does not contain provisions addressing with sufficient clarity and consistency the rates, terms, and conditions of service that apply to interconnection customers serving co-located load.[86] The Commission included, "the scope of the analyses CAISO performs as part of its existing study process to evaluate the impacts of co-location arrangements, which may need to account for any potential dynamic impacts of co-located load and any potential impacts of requests to modify an existing generating facility's interconnection service level to serve co-located load on transmission system reliability."[87] The Commission noted that in one of its recent orders on co-located load in the PJM Interconnection (PJM), it found that it was necessary to clarify that interconnection customers seeking to use new generating facilities to serve co-located load may: (1) request interconnection service at a level below the generating facility's maximum facility output; (2) use existing procedures to accelerate interconnection requests that satisfy certain tariff criteria; and (3) request provisional interconnection service and surplus interconnection service.[88] The Commission additionally noted that interconnection customers should have a means of knowing the appropriate mechanism for setting forth the terms and conditions of co-location arrangements. The Commission also expressed concern that "without an Eligible Customer designated to take transmission service on behalf of a co-located load, there is no mechanism for CAISO to address situations in which a co-located load withdraws energy from the transmission system."[89]

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86 Order to Show Cause at P 93. The Order to Show Cause did not require, and the CAISO does not believe it is necessary, that the CAISO create formal tariff definitions for co-located load or behind-the-meter generation. Both terms already have plain meanings, and behind-the-meter is already used frequently throughout the CAISO tariff, including for different configurations based on whether the meter is a CAISO meter or a retail end-user meter. Thus, providing a definition may have inadvertent consequences to the extent it differs in any meaningful respect from the use of these terms currently. Likewise, the CAISO, PTOs, and developers have not experienced controversy in determining co-location or what constitutes a single site under FERC precedent and State law. The CAISO is thus concerned that trying to create formal definitions at this time may result in false positives or negatives that impair rather than aid development. The CAISO may revisit this issue if controversies arise, or may provide clarifications in its business practice manuals.

87 *Id*. at P 96.

88 *PJM Interconnection, L.L.C.*, 193 FERC ¶ 61,217 at PP 231-235 (2025) (PJM Co-Location Order). PJM's compliance filing proposing revisions in response to these directives was accepted in part on April 16, 2026. *PJM Interconnection, L.L.C.*, 195 FERC ¶ 61,030 (2026).

89 Order to Show Cause at P 96.

Drawing on its track record for co-located generating technologies, the CAISO proposes to clarify how co-located large loads and generation may interconnect to and operate within the CAISO controlled grid.[90] Co-location frequently can result in significant operational flexibility, avoided infrastructure, and reliability benefits. At the same time, physical proximity between load and generation does not guarantee reduced transmission requirements or resource adequacy obligations: The actual benefits depend on the operating characteristics of both resources, their ability to operate independently, and their behavior during contingencies. The CAISO and PTOs thus must draw on their significant experience with co-located and behind-the-meter configurations to help large load developers maximize efficiencies for them and for ratepayers.

The CAISO proposes to clarify in its tariff co-location arrangements that would not require a CAISO resource interconnection request and could be accommodated through applicable PTO or State-jurisdictional retail interconnection tariffs,[91] such as Rule 21.[92] These will include large loads with back-up generation only to be used during outages or islanding, and large loads with non-exporting behind-the-meter generation.[93] The CAISO notes that both categories will require sufficient control technologies to ensure they do not impact the transmission grid.[94]

The CAISO proposes that new or existing large loads seeking to co-locate with new generation that may export energy to the transmission grid[95] will require a CAISO interconnection study under the CAISO's Resource Interconnection

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90 Proposed Sections 25.1, 25.1.1, 25.5.1, 25.7.6 of the CAISO tariff; Proposed Sections 2.4.4 and 6.7.2.9 of Appendix KK to the CAISO tariff.

91 The CAISO reiterates that the PTOs will continue to govern and study all load interconnection requests pursuant to their tariffs. The CAISO, likewise, will continue to govern and study wholesale generation interconnection requests.

92 *See, e.g.*, CPUC's Electric Rule 21: Generating Facility Interconnections, https://www.cpuc.ca.gov/Rule21/. Other local regulatory authorities and utilities have established similar interconnection procedures for back-up, non-injecting, and net metering configurations.

93 Proposed Sections 25.1 and 25.1.1 of the CAISO tariff. The sequencing likewise will not impact whether a CAISO interconnection study is required.

94 The CAISO notes that the CAISO's proposal is fundamentally different than MISO's Zero Injection Generation Resource, at issue in Docket No. ER26-3552. The CAISO's proposed tariff language merely reflects the *status quo* in California and western States, long in practice between local regulatory authorities and CAISO. The CAISO already has thousands of megawatts of generation allowed to interconnect without CAISO study because there is no impact to the CAISO controlled grid, including generation co-located with large loads on the transmission system. More critically, the CAISO requirements only bypass a CAISO interconnection study where there is truly no impact, rather than a netting construct that could ignore short-circuit duty and other reliability impacts.

95 Frequently, constantly, or even rarely, such as in the event the Large Load is offline.

Standards, Appendix KK to the CAISO tariff.[96] This means that such resource interconnection requests will be screened and compete for capacity in the next cluster study based on the CAISO's scoring criteria.[97] However, all scoring, financial requirements, and study results will be based on the requested capacity figures the developer provides, so the developer may significantly limit the generation potentially to be exported based on how much generation will serve the large load.[98] The CAISO tariff will require it to work with the PTOs to produce study results that reflect the combined impact of the co-located large load and generation, as requested by the developer. This is a simple extension of current rules that allow interconnection customers to be studied for a specific interconnection capacity even if their generating capacity is higher. Interconnection requests with co-located large loads may avail themselves of all rights under the Resource Interconnection Standards, including surplus interconnection service, grid enhancing technologies, phasing, etc. Rather than add "and Large Load" throughout the CAISO generator interconnection procedures and agreements, the CAISO proposes general provisions enabling large load studies to be considered in every step of the interconnection process, and that all study results will account for the combined operation of the generating units and large loads.[99] Interconnection customers for generating units and co-located large loads will be subject to all applicable commercial readiness and GIA deposit requirements.[100] Because their costs generally result from network upgrade and interconnection facility costs, which will be based on the combined facility configuration, all required deposits will be fair and equitable under Order No. 2023.

Because it may be difficult to predict every possible issue with future load studies conducted by the PTO and generator studies conducted by the CAISO, the CAISO proposes to include general conflict provisions stating that (1) for any conflict between the CAISO tariff and the PTO tariff pertaining to the interconnection of the generating unit, the CAISO tariff will control; and (2) for any conflict between the CAISO tariff and the PTO tariff pertaining to the

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96 Proposed Sections 25.1, 25.1.1, 25.5.1, 25.7.6 of the CAISO tariff; Proposed Sections 2.4.4 and 6.7.2.9 of Appendix KK to the CAISO tariff.

97 As Energy Only or Deliverable. Energy Only interconnection customers not seeking reimbursement for network upgrades are not screened and proceed directly to the cluster study.

98 This is already the *status quo* per Section 3.1 and Attachment 1 (4.h) of Appendix KK to the CAISO tariff. The CAISO always has allowed interconnection customers to request to be studied for less interconnection service capacity and/or deliverability than generating capacity, and all scoring is calculated on the requested interconnection service capacity or requested deliverability, as applicable.

99 Proposed Section 25.7.6 of the CAISO tariff; proposed Sections 2.4.4 and 3.1 of Appendix KK to the CAISO tariff.

100 Proposed Section 25.7.6 of the CAISO tariff.

interconnection of the large load, the PTO tariff will control.[101] This provision will provide transparency to developers and may help resolve future issues should they arise.

The CAISO notes that despite the ubiquity of co-located resources in California, the CAISO has not received any interconnection requests for co-located load with *CAISO-participating* generation. This is in part because the CAISO is in a different situation than other regions that needed to impose bring-your-own generation requirements to address capacity market issues. Because the CAISO does not have a bring-your-own generation requirement, developers have been less interested in co-locating load with participating generation. Additionally, to the extent large loads have brought generation to serve onsite load, they have elected to do so through tariffs for net energy metering, obviating the need for a CAISO interconnection request. However, developers may want to co-locate load with participating generation in the future. Stakeholders expressed that in California, adding load to existing wholesale generators may be an ideal path to cost savings and utilizing plants that are dispatched infrequently or approaching retirement. As such, the CAISO's tariff revisions document developers' ability to add load to existing generator sites, and that they may maintain all interconnection rights so long as they continue to comply with the CAISO tariff obligations.[102] Specifically, the CAISO proposes to clarify that the addition of a co-located load or large load will not necessarily affect the qualifying capacity, net qualifying capacity, deliverability status, or eligibility to provide energy, ancillary services, or resource adequacy capacity of a generating unit. Any effect of adding a co-located load will be determined under the otherwise applicable CAISO tariff provisions for those rights, modification results, and local regulatory authority requirements.[103]

In addition to the information required in the CAISO resource interconnection request process, and the large load operational requirements discussed in Section III.A.4, the CAISO may require the following operational information for co-located resources, if applicable:

- Expected presence of co-located load;
- Range of energy consumption characteristics of the load;
- Minimum and maximum generator operating capabilities;
- Generator operating characteristics when the load is at its minimum level;
- Market participation status, if any; and

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101 Proposed Section 25.7.6 of the CAISO tariff and proposed Section 2.4.4 of Appendix KK to the CAISO tariff.

102 Proposed Sections 25.5.1 of the CAISO tariff.

103 The CAISO believes this is an important clarification because local regulatory authorities generally set resource adequacy capacity and emissions rules, among others.

- Any load services requested when the generator is off-line.[104]

For co-located large loads and wholesale energy storage, the CAISO notes that the storage and large loads will need to be separate operationally, and all study results will reflect the same.[105] Energy storage resources are fully dispatchable and have separate wholesale meters and settlement. Their energy cannot be commingled with the large load such that the large load could take power effectively at a wholesale rate. The large load can otherwise net its withdrawals against behind-the-meter/non-participating generation and storage.[106]

The CAISO also proposes to require co-located load and exporting generation studies to begin the cluster study process with the large load assumptions. The CAISO also proposes to allow interconnection customers to request to modify or remove large loads during the study process, and for the PTOs and the CAISO to evaluate whether the requested change is a material modification. (The removal or modification to the large load would be under the PTO tariff.) In other words, after the commencement of the cluster study, the interconnection customer may request to remove the large load as a modification, and the CAISO and PTOs will evaluate whether the requested change can be accommodated. Likewise, interconnection customers already in the queue can request to add large loads as modifications, subject to PTO and CAISO evaluation, including through downsizing requests as necessary. The CAISO and PTO will assess whether either change would require complete re-studies and could not be accommodated during the study process, or if the requested modifications are material. This is not to say that the CAISO proposes to prohibit the addition of large loads to existing generation or in-progress interconnection requests; only that the interconnection customer would need to do so through the PTO tariff, and the generation interconnection study results may not be able to reflect the combined configuration if changed substantially well after studies commence (similar to any other modification request).

If an online CAISO generator seeks to add a large load to its site, the developer would submit the large load interconnection request to the PTO pursuant to its tariff. When ready to reflect the large load, the interconnection customer could request a post-commercial operation date (COD) modification[107] or use the Master File change process as needed to assess and capture

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104 Proposed Section 25.7.1 of the CAISO tariff.

105 Proposed Section 25.7.5 of the CAISO tariff.

106 In other words, the CAISO does not propose any change to the *status quo* for separating wholesale generation/storage and retail load or net energy metering generation/storage.

107 Section 25.5 of the CAISO tariff.

changes currently allowed under these processes.[108] The CAISO, PTO, and interconnection customer could likewise amend the generator interconnection agreement to reflect the large load and any configuration changes.

The CAISO notes that both loads and generation associated with co-located loads can be eligible for resource adequacy or demand response programs pursuant to current program rules.[109] Therefore, the CAISO does not propose changes to the eligibility criteria for participation in any of these programs.

2. Cost Allocation for Co-located Loads

In the Order, the Commission stated that the CAISO tariff does not appear to include a mechanism to charge large loads, and co-located loads in particular, for ancillary services commensurate with their use of such services, particularly if such customers do not withdraw energy from the transmission system.[110] Specifically, the Commission noted that co-located loads may unjustly benefit from regulation and black start services.[111]

The CAISO agrees that assessing ancillary service costs on a net $/MWh basis to LSEs' measured demand could enable a large load co-located with behind-the-meter generation to avoid an appropriate share of its costs for regulation and black start services.[112] Unlike some other ISO/RTOs, however, the CAISO already has separate, specific rates to assess regulation[113] and black start services.[114] The issue thus becomes how to appropriately meter and assess those rates onto co-located large loads. The CAISO proposes to address this issue by requiring the PTOs to sub-meter each co-located large load

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108 *See* CAISO Master File at https://www.caiso.com/systems-applications/portals-applications/master-file.

109 Section 40 of the CAISO tariff establishes rules about eligible capacity and uses criteria provided by the CPUC and other Local Regulatory Authorities determine what projects are resource adequacy eligible.

110 Order to Show Cause at PP 98-99 ("As noted in the PJM Co-Location Order, this introduces the risk that costs may be allocated entirely to other transmission customers and passed through to residential customers, among others").

111 *Id*.

112 Likewise, if the rate were assessed on a net meter basis to co-located load and participating generation, the result would be the same.

113 Section 11.10.2.1 of the CAISO tariff.

114 Section 11.4.2 of the CAISO tariff. The PTOs assess the costs of black start services through their PTO tariffs.

independent of any onsite generation.[115] Scheduling coordinators for the load-serving entities serving those loads will then be required to report those meter values separately for the relevant CAISO charge codes. Going forward, the rates' calculations will include all separately submitted gross volumes for the large loads. Each large load with co-located generation will pay on a gross load basis for regulation and black start services.[116] This solution not only results in just and reasonable cost allocation, it is also relatively simple to implement because the CAISO and PTOs will not be required to calculate and assess new rates, nor will the CAISO need to create new settlement charge codes.

3. Transmission Access Charges

The Commission preliminarily found in the Order that the CAISO tariff may be unjust and unreasonable because it allows load with behind-the-meter generation to net its generation against its load for purposes of calculating Regional Access Charges.[117] The Commission explained its thinking based on the PJM co-location proceeding:

> In the PJM Co-Location Order, the Commission found that PJM's BTMG rules, which allowed load-serving entities that provide service to loads with qualifying BTMG to reduce their costs by netting output from BTMG in the calculation of their peak demand for the purpose of determining NITS charges, were unjust and unreasonable. The Commission concluded that PJM's BTMG rules were no longer consistent with cost causation principles because large loads configured in a BTMG arrangement with significant generation will raise cost shifting concerns compared to loads pursuing smaller amounts of netting. The Commission also found that such rules could lead to reliability and resource adequacy risks because PJM is obligated to serve transmission customers using BTMG but does not consider such customers in transmission and resource adequacy planning.[118]

The Commission then noted that it is "similarly concerned that CAISO's Tariff allows Eligible Customers that provide service to loads with BTMG to reduce

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115 Proposed Section 11.36 of the CAISO tariff.

116 Pursuant to the CAISO tariff, the CAISO assesses reliability services costs—the settlement charge for black start costs—to the PTOs, who then allocate those costs to their customers. The CAISO's proposed tariff revisions thus create specific sub-allocations earmarked for large loads, based on their gross load.

117 Order to Show Cause at P 102.

118 *Id*.

their network service charges because the definition of gross load,[119] which is used to calculate the Regional Access Charge, excludes load of a retail customer served by its own onsite generating unit or energy storage device." The Commission directed the CAISO to explain whether the tariff remains just and reasonable even though it allows netting of behind-the-meter generation from gross load for purposes of determining Regional Access Charges for loads with behind-the-meter generation, or to propose tariff revisions. The Commission also stated that the CAISO may explain why the CAISO believes it remains just and reasonable for network customers that fall below a new megawatt materiality threshold for the amount of load at a particular electrical location to net using behind-the-meter generation.[120]

The CAISO believes that its current transmission access charge structure is just and reasonable. Respectfully, the concerns underlying the Commission's findings in the PJM proceeding do not translate to the CAISO. The CAISO and PJM have very different forward capacity, resource adequacy, and transmission service constructs. Moreover, behind-the-meter generation is far more abundant in California, so the CAISO and California policymakers have considered this issue more extensively than other regions. For example, in 2020, the Commission approved the CAISO's proposal to amend its definition of Gross Load—the billing determinant for transmission access charges—to include load served by excess behind-the-meter production, *i.e.,* behind-the-meter energy that exceeds the onsite load. The CAISO amended this policy to ensure uniform settlement practices, and to ensure load-serving entities were allocated the correct costs of their use of the transmission system, which includes use by excess behind-the-meter generation. The CAISO did not propose to assess transmission access charges based on gross load figures that included load served onsite by its own behind-the-meter generation. Neither the CAISO nor stakeholders in 2020 believed such loads use the transmission grid in proportion to those load figures. To the contrary, a benefit of rooftop solar, onsite storage, and other behind-the-meter generation is to reduce the use of the grid and the generation delivered across it. The CAISO does not believe this rationale has

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119 Appendix A to the CAISO tariff defines Gross Load as "Demand (adjusted for distribution losses) of End-Use Customer Loads directly connected to the transmission facilities or directly connected to the Distribution System of a Utility Distribution Company or MSS Operator located in a PTO Service Territory, or End Use Customer Loads directly connected to the Distribution System or transmission facilities of an EDAM Transmission Service Provider in an EDAM Entity Balancing Authority Area. Gross Load includes Load served by Excess Behind the Meter Production. Excess Behind the Meter Production shall not be netted against End-Use Customer Load in determining Gross Load." The definition also provides a list of certain loads excluded, including "Load of an individual retail customer served by its own onsite Generating Unit or energy storage device, or as authorized by Section 218 of the California Public Utilities Code;" and "Onsite Load served by a qualifying small power production facility or qualifying cogeneration facility, as those terms are defined in the FERC's regulations implementing Section 201 of the Public Utility Regulatory Policies Act of 1978."

120 Order to Show Cause at P 102.

changed in light of large loads. Although a customer with behind-the-meter generation may still depend on transmission capacity and reliability services if its generation is unavailable, the CAISO and LSEs reflect those costs through the reliability services charges described above, and through stand-by service rates assessed by the LSEs. Assessing transmission access charges without reflecting behind-the-meter generation also could lessen the incentives to avoid using and building out the transmission grid in the first place.

Perhaps more critically, the CAISO's transmission access charges are fundamentally different from the PJM transmission charges that concerned the Commission. PJM calculates and assesses its transmission charges based on certain peak demand figures. A large load with behind-the-meter generation could mask all of its transmission usage simply by producing generation equal to its demand during that peak period. In contrast, the CAISO assesses its transmission access charges 24/7/365 to each utility based on its gross load, which consists of total end-user demand accounting for losses and excess behind-the-meter production. As such, the CAISO will allocate costs to each large load with behind-the-meter generation to the extent the large load uses the transmission system, as reflected by its metered load. In other words, any energy withdrawal by the large load will be reflected in the gross load. The LSE can then easily pass down the costs of that use in the retail bill, just as the millions of Western residents with rooftop solar or battery storage are billed today. Thus, the CAISO does not believe that changes to its tariff are needed to address concerns raised by the Commission in the Order.

D. Extending New Transmission Services to Eligible Customers Taking Service on Behalf of Flexible Large Loads

In the Order, the Commission preliminarily found that the CAISO tariff may be unjust and unreasonable because it does not include transmission services that reflect eligible customers taking transmission service on behalf of flexible large loads that are willing and able to limit their use of the transmission system under certain conditions, suggesting that "firm use" is essentially the only type of transmission service available in the CAISO. The Commission encouraged new transmission services be made available to reflect the operational reality that large loads may use the transmission system to differing extents and certain large loads are willing and able to limit their use of the transmission system under certain conditions.[121] At the same time, the Commission stated, "In the alternative, CAISO may explain whether, given that CAISO does not offer the transmission services required by Order No. 888, CAISO's existing transmission service framework addresses the concerns described herein, or explain what specific changes to its existing transmission service framework would effectively provide the same range of transmission service options for flexible large loads as

[121] *Id*. at P 104.

in the PJM Co-Location Order."[122] The Commission then explained that the customer "must have necessary control technologies and/or protection systems, which may include a special protection scheme, to limit its energy withdrawals to its approved level," which are typical elements of interconnection service.[123]

The CAISO proposes to create a new flexible interconnection service option that will enable large loads and co-located loads to limit their energy withdrawals or injections until their network upgrades are placed into service. The CAISO believes this will provide large load developers with the option to interconnect to the transmission system quickly through enforceable physical and operational controls. The PTOs will define and implement this interconnection service offering, and the CAISO will ensure that any flexibility provides greater reliability to the system. The CAISO does not propose to create new "transmission services" or more responsibilities around eligible customers, which would require redesigning transmission and interconnection service entirely. The CAISO does not believe such a redesign is warranted, and the Commission expressly invites the CAISO to explain alternative service frameworks that may enable similar flexibility.[124]

The CAISO proposes to create a new "Flexible Interim Load Interconnection" (FILI) service that will enable faster interconnections while mitigating transmission constraints and will be implemented in close coordination with the PTOs.[125] The proposed FILI offering will enable large loads to interconnect flexibly and receive service up to a certain level based on grid conditions and constraints until network upgrades are complete, at which time the large load will switch over to receiving firm service. This will likely be a bespoke option for each large load based on its point of interconnection and the constraints it faces, and will be developed through a contractual agreement with the PTO. For example, some FILIs may require limited curtailability for a limited time because there are few, less probable contingencies. Others may require more because of transmission constraints that require network upgrades with longer timelines. The FILI option provides flexibility to the PTOs, CAISO, and

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122 *Id*. at P 103.

123 *Id*. Moreover, in real time, LSEs can schedule demand as needed, including for customers limiting their use of the transmission system. With the operational data and process described in Section III.A.4, the CAISO can accommodate flexible loads without creating new separate classes of transmission service. This will also enable the PTOs to provide bespoke interconnection configurations for large loads, saving ratepayers from the costs of network upgrades that conform to specific "transmission services." The CAISO believes this course of action is consistent with developers' desires to interconnect quickly and affordably.

124 *Id.* at P 101.

125 The CAISO clarifies that this interconnection service offering is not intended to address supply constraints, which the CAISO does not have at this time, as explained in the CAISO's 30-day informational report on resource sufficiency.

developers to customize solutions. For this reason, the CAISO declines to propose any kind of temporal or capacity cap on this interconnection service offering.

FILI may include a number of tools or measures identified by the PTO with the CAISO's concurrence. They could include, for example, Remedial Action Schemes (RAS), enforceable operating requirements, or managing to a preset schedule.[126] The PTO may request automated schemes, such as a RAS, for FILI that are limited by the transmission overload under N-1-1, with the CAISO and Reliability Coordinator (RC) concurrence; or the PTO will perform its own load curtailment for FILI that is limited by transmission overload under N-1-1 after the first N-1 contingency occurs.

Prior to the energization of the large load, the CAISO, PTO, and large load or its authorized agent will negotiate and execute an agreement describing the circumstances in which the large load receiving FILI may be temporarily curtailed and the mechanism used to perform the curtailment. The CAISO will work closely with the PTO and large load developer to ensure the compliance obligations for each party adhere to all operating limits and promote reliability. At a minimum, the agreement will specify:

a) The circumstances, contingencies, or operating conditions in which the large load would be curtailed
b) The mechanism used to perform the curtailment
c) The entity responsible for performing the curtailment
d) The notification method, response time, duration, restoration, testing, and verification requirements
e) The interim operating limits both in and out of curtailable events, and
f) The network upgrades or interconnection facilities required to conclude the curtailability requirements.

The CAISO will post these agreements on the CAISO website. The CAISO base case, full network model, and operating procedures will account for such large loads as applicable. This will ensure transparency over FILI arrangements, enabling developers and market participants to understand the offering and any potential impact. Before energization of large loads, the CAISO will work with the large load developers and PTOs to test any FILI tools for safety and reliability, just as the CAISO and PTOs do the same for generator interconnections today.

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[126] The CAISO and PTOs have had success with preset schedules with energy storage resources that elect to forgo upgrades and thus may not charge during peak conditions (*e.g.,* summer afternoons).

The CAISO's proposed FILI framework fulfills the Commission's central objective of making meaningful service options available to large loads whose willingness and ability to limit withdrawals permit earlier, reliable access to the transmission system, without importing three distinct transmission service products into the CAISO's unique market structure. The Order expressly allows the CAISO to explain how changes within its existing framework can provide comparable flexibility, rather than requiring it to replicate the service classifications contemplated for PJM. FILI translates that flexibility into enforceable interconnection terms: a large load may energize before completion of required network upgrades, but only within operating limits supported by system conditions and subject to specified curtailment triggers, control mechanisms, response times, and verification requirements. Agreements executed before energization identify those obligations and the facilities necessary to conclude interim service, while incorporation into the CAISO's models and operating procedures makes the customer's flexibility operationally usable rather than merely aspirational. Public posting of those agreements also provides transparency into the conditions governing access. Although FILI is an interim arrangement rather than a substitute for every feature of the three contemplated services, it addresses the immediate barrier posed by transmission construction timelines while preserving reliability and applicable cost-responsibility requirements. The relevant distinction is therefore not the number or label of service offerings, but whether the framework enables customers to obtain earlier service commensurate with their actual, enforceable use of the grid—the result FILI is designed to achieve.

As described in Section III.F, below, the CAISO plans to develop a permanent version of FILI in 2027. This would allow large loads to forgo some identified network upgrades altogether if the large loads were curtailable. The CAISO recognizes that permanent load flexibility can have significant value even in a system with adequate aggregate generating capacity. Although the CAISO believes its tariff is just and reasonable without a permanent option at this time, the CAISO is committed to exploring the permanent option. The prioritization of FILI is consistent with stakeholders' comments, especially from the large load development community.

E. Interconnection Customers Serving Electrically Proximate Large Load and Co-Located Load

The Commission preliminarily found in the Order that the CAISO tariff appears to be unjust and unreasonable because it does not contain provisions allowing an interconnection customer to seek the generator interconnection service(s) that reflects the operational dynamics of serving either: (1) an electrically proximate large load; or (2) a co-located load, as defined in the Order, that has a high peak load (i.e., large co-located loads that are 50 MW or

greater).[127] The Commission defined an "electrically proximate large load" as a large load "sufficiently electrically close to the interconnection customer's requested point of interconnection, such that the impact on the transmission system of the combination of the generating facility and the load, with the exception of the transmission facilities between the two, will be effectively the same as if they were located at the same substation (e.g., large load that is located no more than two substations from the generating facility)."[128]

The CAISO has committed to examining electrically proximate co-location in an upcoming stakeholder initiative to determine whether it may have future value for the CAISO and developers. Stakeholders, especially data center developers, agreed during the CAISO's stakeholder process in response to the Order that electrically proximate co-location is not a near-term priority. The CAISO thus believes its tariff is just and reasonable at this time without provisions allowing an interconnection customer to "co-locate" or otherwise be studied with an electrically proximate large load.

The Commission's contemplated treatment of electrically proximate generation and large load addresses a potential benefit of studying their combined transmission-system effects, but the need for a separate service pathway must be evaluated against the CAISO's existing framework. Unlike an Eastern framework that conditions a large load's energization on the development of corresponding generation, the CAISO does not require a large load customer to bring its own generation or pair its interconnection request with a particular generating facility. Supply adequacy remains the responsibility of the LSE under applicable resource adequacy and regulatory requirements, while the load's ability to interconnect depends on the applicable studies, available transmission capability, necessary facilities, and operating requirements. Accordingly, to the extent an electrically proximate pathway is intended to enable a customer to satisfy a generation-matching condition or obtain an exception from such a condition, it solves a problem the CAISO's framework does not impose. The CAISO's near-term reforms instead target the barriers its customers actually face, including transmission construction timelines, coordinated studies, and enforceable operating limits that can permit earlier energization.

That distinction does not mean electrically proximate generation and load can never produce transmission benefits. The Order's premise—that sufficiently close generation and load may have combined effects resembling a co-located arrangement—presents a legitimate study question. It does not, however, establish that electrical proximity alone eliminates the need to evaluate intervening facilities, the consequences of a generator outage or a change in load, or the obligations necessary to make any assumed offset dependable. Nor

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127 Order to Show Cause at P 113.

128 *Id*. at P 112.

does the absence of a customer-specific generation requirement, standing alone, resolve the Commission's concern about recognizing combined system impacts. The CAISO therefore distinguishes between considering those impacts and creating an immediate, separate interconnection pathway for paired projects. Its proposed sequencing allows the CAISO and stakeholders to address the additional study and operating questions associated with electrically proximate arrangements without delaying reforms applicable to stand-alone loads and co-located configurations.

The stakeholder process supports that sequencing rather than a categorical rejection of electrically proximate arrangements. As the CAISO explained in its October 22, 2026 Board memorandum, stakeholder feedback led it to prioritize the more common stand-alone and co-located load and generator interconnections in this proposal and filing, with electrically proximate arrangements to follow once the co-location process is underway. The appropriate conclusion is therefore not that stakeholders oppose innovation or that developers could derive no benefit from a future pathway, but that the CAISO identified more immediate priorities for this filing. Preserving electrically proximate arrangements for subsequent policy development permits further consideration of their potential benefits and necessary safeguards while advancing the interconnection, reliability, customer-protection, and flexible interim service reforms that can be implemented now.

F. Future Issues

The CAISO remains committed to working with stakeholders, PTOs, and State energy agencies, to support the reliable integration of large loads. Building on the reforms in this initiative, the CAISO has identified several areas for continued stakeholder engagement, including operational and technical requirements, market participation, flexible interconnection, electrically proximate loads, cost allocation, and implementation of recent State legislation.

First, the CAISO will continue coordinating with California's principal energy agencies, the CPUC and CEC, as well as local regulatory authorities and other stakeholders, to address statutory requirements arising from recently enacted large load legislation.[129] As the large load landscape continues to evolve, the CAISO recognizes the need to review existing processes and develop additional tools to support reliable integration. This includes exploring a risk-mitigation framework under which local regulatory authorities, load-serving entities, utility distribution companies, metered subsystems, the PTOs, and the CAISO could curtail large loads under tight grid conditions before a reliability event. [130] The CAISO expects to explore this framework through a stakeholder

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129 *See* Large Load Enhancements Draft Final Proposal at pg. 8, included as Attachment C.

130 Id.

process beginning in early 2027.[131] Unlike other markets that have developed curtailment *requirements* the Commission has rejected as improper conditions of retail service,[132] the CAISO currently plans to develop curtailment *tools* the LSE and local regulatory authority can use pursuant to their jurisdiction.

Second, the CAISO is committed to continuing to work with NERC and WECC on new reliability requirements for computational loads and other large loads. The CAISO and PTOs will ensure that their tariffs do not conflict or unduly overlap with similar reliability standards. All parties must work to ensure compliance maintains reliability without being unduly burdensome. This work will complement the CAISO's ongoing engagement with the PTOs and the LLTRWG.

Third, the CAISO will continue engaging stakeholders on opportunities for large load market participation, including participation through demand response, price responsive load, and other market mechanisms. This work will continue in the CAISO's ongoing Demand and Distributed Energy Market Integration (DDEMI) initiative throughout 2027, including EWG efforts on coordination framework.[133] Similarly, while the CAISO is committed to respecting FERC's jurisdictional considerations, the CAISO understands that distribution-connected and non-PTO connected loads can impact the transmission system. Although the CAISO already considers transmission network upgrades driven by these loads through the transmission planning process, the CAISO may consider through DDEMI whether additional measures are appropriate when these loads affect the transmission system. As additional large loads, including loads co-located with generation, interconnect to the system, additional resource adequacy or reliability issues may also emerge. Any necessary modifications to resource adequacy requirements would be considered through future resource adequacy policy initiatives at the CAISO and in coordination with local regulatory authorities.[134]

Fourth, the CAISO will further explore flexible load interconnection – permanent (FLIP) through a stakeholder initiative that is expected to commence in 2027.[135] If developed and implemented, FLIP would enable large loads to

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131 *See* 2027-2029 ISO Draft Infrastructure Policy Roadmap at https://stakeholdercenter.caiso.com/InitiativeDocuments/2027-2029-ISO-Draft-Infrastructure-Policy-Roadmap-Oct-8%202026.xlsx.

132 *PJM Interconnection*, 197 FERC ¶ 61,019 at P 77 *et seq.* (2026).

133 *See* 2027-2029 California ISO Market Policy Initiatives Roadmap at https://stakeholdercenter.caiso.com/InitiativeDocuments/2027-2029-ISO-Draft-Market-Policy-Roadmap-Sep-24-2026.xlsx.

134 *See* Large Load Enhancements Draft Final Proposal at pp.54-55.

135 *See* 2027-2029 ISO Draft Infrastructure Policy Roadmap at https://stakeholdercenter.caiso.com/InitiativeDocuments/2027-2029-ISO-Draft-Infrastructure-Policy-Roadmap-Oct-8%202026.xlsx.

interconnect and avoid the need to fund completion of transmission network upgrades that would be required for firm load service by accepting terms of flexible interconnection service in perpetuity. As explained above, large load developers and stakeholders broadly desired the CAISO to prioritize FILI, and develop FLIP in 2027.

Finally, stakeholders also stressed the need for the CAISO to prioritize the more common stand-alone and co-located load and generator interconnections in the near-term; however, the CAISO is committed to exploring provisions for interconnection customers to serve electrically proximate loads in a future stakeholder initiative. The CAISO has included a stakeholder initiative to address these items on its draft Infrastructure Policy Roadmap and expects to begin policy development in early 2027.[136]

These commitments should further demonstrate to the Commission that the CAISO will continue to innovate interconnection and market efficiencies for large loads without the need for a Section 206 proceeding.

IV. Briefing Questions

The CAISO responds to the Order's briefing questions as follows:

P 123:[137] How CAISO and the Participating Transmission Owners, in responding to the order to show cause, should protect existing commercial arrangements including: (1) what would be a reasonable implementation period to ensure minimal disruption to such existing commercial arrangements; and (2) how to allow a reasonable amount of time to finalize ongoing agreements that are nearing completion as of the date such tariff provisions are filed with the Commission.

The CAISO and PTOs have designed their tariff revisions to apply to future large load interconnection requests, thus protecting existing commercial arrangements. The CAISO and PTOs have not proposed imposing any of the new large load requirements on operational loads or loads that completed interconnection requests before the proposed effective date of these tariff revisions. As such, the CAISO and PTOs can implement their tariff revisions

136 *Id.*

137 "We note that large loads, including data centers, are actively working with transmission owners and other relevant entities to interconnect to, and to take interconnection and/or transmission service from, the transmission system and may be at varying stages of that process. We appreciate that different large loads are currently at different stages of that process. We also understand that large loads and Eligible Customers taking transmission service on behalf of large loads are negotiating, entering into, and/or have executed various agreements related to interconnecting to the transmission system and/or the provision of transmission service." Order to Show Cause at P 123.

expeditiously without disrupting existing commercial arrangements. Future large load developers will have sufficient notice of these new rules while operational and in-flight loads can proceed without disruption.

P 124:[138] *What, if any, potential impacts on regional and local transmission planning would arise from the introduction of the new transmission services discussed herein? For example, when planning for load growth, how would transmission providers and planners account for flexible large loads' potential preference to take the new transmission services, including potential uncertainties around the type, location, and quantity of such expected loads?*

The CAISO and PTOs do not believe that flexible large loads will create significant new challenges for regional and local transmission planning for two reasons. First, flexibility is a tool, not a hindrance: flexible loads create more opportunities for lower-cost, bespoke planning solutions. For FILI specifically, the service is interim and tied to identified network upgrades, and the CAISO will reflect FILI loads and applicable operating limits in its models and operating procedures." Second, the CAISO and local regulators are accustomed to planning for flexible, non-traditional loads, including batteries, electric vehicle charging stations, and homes with behind-the-meter solar and storage systems. Flexible large loads will join this mélange, but as a contribution rather than a challenge. The CAISO and PTO planning departments are also highly accustomed to planning the grid around flexible resources, namely generating facilities. This is especially true in the CAISO, where over 17,000 MW of energy storage resources have interconnected in the past few years.

P 125:[139] *We direct respondents to include information regarding potential structures for agreements between the transmission owner/provider and an Eligible Customer to prevent unjust and unreasonable cost shifts among transmission customers related to network upgrade costs required for large loads. Further, please include information on what an appropriate minimum level of cost recovery and financial security from an Eligible Customer would be under any such agreements.*

The CAISO responds to this issue in Section III.B, above.

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138 "Today's order proposes, as part of a potential replacement rate, to establish new transmission services that recognize flexible large loads' ability and willingness to limit their use of the transmission system under certain conditions. As we assess this proposal, we also consider how these new transmission services might affect other parts of CAISO's Tariff and/or processes." Order to Show Cause at P 124.

139 "Today's order preliminarily finds that CAISO's Tariff appears to be unjust and unreasonable without the inclusion of cost shifting protections. We find that there may be a variety of possible approaches to protect customers from significant cost shifts associated with network upgrades triggered by large loads." Order to Show Cause at P 125.

P 126:[140] *To the extent stakeholders believe that specific characteristics of providing transmission service to Eligible Customers on behalf of large loads warrant requirements beyond those contemplated here [for ATTs], we seek further briefing.*

The CAISO's stakeholder process supported the CAISO's proposed tariff revisions memorializing its consideration of ATTs in transmission planning and interconnection procedures. The CAISO has a long, proven track record of considering ATTs and non-transmission solutions, as discussed in Section III.A.3, above.

P 127:[141] *(a) To what extent would CAISO allow an interconnection customer's generating facility serving electrically proximate large load or large co-located load to participate in CAISO's energy and ancillary services market, and if CAISO were to allow them to participate, what restrictions or mitigation would CAISO apply?*

The CAISO has not proposed excluding any loads or co-located resources from using any participation model or providing any service for which they can meet the existing tariff requirements. Loads large and small and co-located generators already participate in the CAISO markets today and provide every service, including capacity and ancillary services. Here again, the CAISO has a proven track record of innovation to enable non-conventional resources to access the CAISO markets.

P 127: (b) To the extent that CAISO plans for the electrically proximate large load or large co-located load associated with an interconnection customer's

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140 "Today's order preliminarily finds that CAISO's Tariff appears to be unjust and unreasonable because it lacks clear and consistent provisions requiring the evaluation of alternative transmission technologies. The order directs CAISO to explain whether the Tariff remains just and reasonable without provisions that (1) require the evaluation of alternative transmission technologies in studies for the provision of transmission service, using models that are capable of evaluating the transmission system to accurately account for advanced transmission technologies, in all instances, without the need for a request from the Eligible Customer seeking transmission service on behalf of large load; and (2) if traditional network upgrades are selected instead of alternative transmission technologies, inclusion in the study report to the Eligible Customer seeking transmission service on behalf of large load of a sufficiently clear demonstration of why alternative transmission technologies are not feasible (i.e., would not resolve reliability violations identified or meet the relevant planning criteria) or would not result in lower costs or a faster timeline for accommodating the transmission service request." Order to Show Cause at P 126.

141 "Today's order preliminarily finds that CAISO's Tariff appears to be unjust and unreasonable because it does not contain provisions allowing an interconnection customer serving electrically proximate large load or large co-located load to seek generator interconnection service(s) that reflects the operational dynamics of serving such loads." Order to Show Cause at P 127.

generating facility for resource adequacy purposes, would CAISO account for the generating facilities serving electrically proximate large load or large co-located load in the resource adequacy construct? If applicable, would CAISO allow the generating facilities serving electrically proximate large load or large co-located load to participate in CAISO's capacity market? If so, would CAISO accredit these generating facilities using the same method as other CAISO generating facilities?

Nothing in the current CAISO tariff or the CAISO's proposed tariff revisions would make co-located generating facilities ineligible to provide resource adequacy, nor affect their qualifying capacity. So long as the generating facility continues to meet all portfolio, capacity, and must-offer obligations, and respond to all CAISO dispatches, the CAISO does not have cause to remove or reduce their resource adequacy value.

As the CAISO explained in its 30-day informational report and in Section II.B.1, the CAISO does not administer a centralized forward capacity market. The CPUC, in consultation with the CAISO, establishes resource adequacy requirements for CPUC jurisdictional load serving entities. CPUC-jurisdictional load serving entities represent the vast majority of the load in the CAISO's service territory. Other local regulatory authorities within California, like municipal utilities, establish these requirements for load serving entities under their authority. The CAISO only sets default resource adequacy requirements if a local regulatory authority elects not to establish their own. Moreover, the CPUC establishes resource accreditation methodologies and counting rules used to determine the qualifying capacity of resource types participating in the resource adequacy program. As such, the CPUC and local regulatory authorities will evaluate whether co-located or other loads affect generating facilities' ability to provide resource adequacy capacity.

V. Order to Show Cause

The Commission should conclude the Order to Show Cause proceeding. Only a small minority of comments in the Commission's ANOPR proceeding referenced the CAISO and the West, and fewer, if any, argued that the *status quo* was unjust and unreasonable. As the CAISO describes above, a significant portion of the Commission's findings in the Order to Show Cause are based on issues specific to other markets. Although no one in the West would argue that the work is done, the CAISO and PTO filings demonstrate they will continue to proactively evolve to meet the demands of large loads. The CAISO and stakeholders are committed to the principles the Commission established in the Order, and will continue to bring frequent, rapid enhancements to the Commission for approval without the need for a Section 206 proceeding.

VI. Effective Date, Comment Period, Request for Waiver

With the exception of the two sections described below, the CAISO requests that the Commission accept the tariff revisions contained in this filing effective February 16, 2027 (*i.e.*, 92 days after the date of this filing).[142] Although the CAISO is ready to implement its tariff revisions as soon as approved, the CAISO is proposing a 92-day notice period to recognize that comments and Commission review are largely occurring over the holiday season. Similarly, the CAISO requests the Commission establish a 30-day deadline for comments on the CAISO's filing so stakeholders have additional time for the Thanksgiving holiday.

The CAISO requests that the Commission accept the tariff revisions in Sections 25.7.3 and 25.7.3.1 (scheduling coordinator requirements) effective November 1, 2027, and the tariff revisions in Section 11.36 (settlements) effective April 30, 2028. The CAISO respectfully requests waiver of the Commission's 120-day notice requirement to permit the requested November 1, 2027 effective date.[143] Good cause exists to grant the requested waiver. The tariff revisions will require software development, simulation, and scheduling coordinator training. The CAISO's proposed effective dates align with their annual software releases for scheduling coordinator software in the Fall and settlements software in the Spring. Importantly, the effective dates for these technology changes should have little or no negative impact because the CAISO software will be available before the new large loads subject to those requirements will finish studies and construction.

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142 February 14, 2027 is a weekend, and February 15, 2027 is a federal holiday, hence 92. The CAISO may have other proceedings revising some of the sections in the instant filing. If necessary, the CAISO will reconcile any overlapping revisions after Commission review.

143 Specifically, pursuant to section 35.11 of the Commission's regulations, 18 C.F.R. § 35.11, the CAISO respectfully requests waiver of the notice requirement in section 35.3(a)(1) of the Commission's regulations, 18 C.F.R. § 35.3(a)(1), to allow the tariff revisions to go into effect more than 120 days after submittal of this filing.

VII. Communications

Pursuant to Rule 203(b)(3) of the Commission's Rules of Practice and Procedure,[144] the CAISO requests that all correspondence, pleadings, and other communications regarding this filing should be directed to the following:

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VIII. Service

The CAISO has served copies of this filing on the CPUC, the CEC, and all parties with scheduling coordinator agreements under the CAISO tariff. In addition, the CAISO has posted a copy of the filing on the CAISO website.

IX. Contents of Filing

In addition to this transmittal letter, this filing includes the following attachments:

Attachment A	Clean CAISO tariff sheets incorporating this tariff amendment
Attachment B	Red-lined document showing the revisions in this tariff amendment
Attachment C	Final Proposal
Attachment D	Technical Working Group Proposal
Attachment E	Board Memorandum

144 18 C.F.R. § 385.203(b)(3).

X. Conclusion

For the reasons set forth above, the CAISO respectfully requests that the Commission accept the CAISO's proposed tariff revisions and conclude the Order to Show Cause proceeding.

Respectfully submitted,

/s/ William H. Weaver
Roger E. Collanton
General Counsel
William H. Weaver
Assistant General Counsel
California Independent System
Operator Corporation

Counsel for the California Independent System Operator Corporation

Attachment A – Clean Tariff

Large Loads Tariff Amendment

California Independent System Operator Corporation

November 16, 2026

Note: Grey highlighted text represents tariff revisions pending approval in docket number ER26-704.

Section 4

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Section 4.19 Large Loads

Consistent with any Local Regulatory Authority requirements, Large Loads and Loads may participate in the CAISO Markets using any model where they are capable of complying with the CAISO Tariff requirements, including without limitation as Proxy Demand Resources, Reliability Demand Response Resources, Participating Loads, Load-Serving Entities, and Non-Generator Resources. Large Loads may participate alone or in permissible aggregations, including with co-located Generating Units. Large Loads and Loads participating in the CAISO Markets are eligible for all rights and subject to all obligations of the CAISO Tariff under those participation models. Large Loads and Loads are eligible to provide, without limitation, Demand Response Energy, Curtailable Demand, Resource Adequacy Capacity, and Ancillary Services consistent with their participation model and subject to the requirements of the CAISO Tariff.

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Section 11

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Section 11.37 Large Load Requirements

The Scheduling Coordinator representing any Large Load pursuant to Section 25.7.3 will provide the CAISO Settlement Quality Meter Data on the gross Demand of the Large Load, excluding any offsetting Energy, including from co-located or behind-the-meter generation. The CAISO will charge the applicable Scheduling Coordinator based on this Meter Data the hourly user rate for Regulation Down Reserve,

Regulation Up Reserve, and Reliability Services Costs. In calculating the rates for these charges, the CAISO will include all separately submitted volumes for Large Loads.

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Section 24

24. Comprehensive Transmission Planning Process

24.1 Overview

The CAISO will develop a comprehensive Transmission Plan and approve transmission solutions using the Transmission Planning Process set forth in this Section 24. For purposes of this Section 24, transmission solutions include both entirely new transmission facilities and upgrades or additions to existing transmission facilities that are proposed, considered, and/or specified in the comprehensive Transmission Plan during Phase 2 to meet an identified need determined by the CAISO. The CAISO will consider the use of alternative transmission technologies including dynamic line ratings, advanced power flow control devices, advanced conductors, and transmission switching when evaluating transmission solutions for new regional transmission facilities, Large Loads, upgrades to existing transmission facilities, and Long-Term Regional Transmission Facilities. Alternatives to transmission solutions are referred to as non-transmission solutions. Solutions to meet an identified need can be either transmission solutions or non-transmission solutions. The CAISO will analyze the need for transmission solutions in accordance with the methodologies and criteria set forth in this Section 24, the Transmission Control Agreement, and the applicable Business Practice Manuals. The comprehensive Transmission Plan will identify Merchant Transmission Facilities meeting the requirements for inclusion in the Transmission Plan and transmission solutions needed (1) to maintain System Reliability; (2) to satisfy the requirements of a Location Constrained Resource Interconnection Facility; (3) to maintain the simultaneous feasibility of allocated Long-Term CRRs; (4) as additional components or expansions to LGIP Network Upgrades are identified pursuant to Section 24.4.6.5; (5) to meet state, municipal, county and federal policy requirements and directives, including renewable portfolio standards policies; and (6) to reduce congestion costs, production supply costs, transmission losses, or other electric supply costs resulting from improved

access to cost-effective resources.

Beginning in 2027, the CAISO will transition to two complementary transmission planning cycles: (a) a comprehensive transmission plan performed biennially (every two years) with the first biennial comprehensive transmission plan to be issued in 2030; and (b) a Long-Term Regional Transmission Plan performed every four years, with a plan first issued in 2030, and further described in Section 24.11. Additionally, the CAISO will perform reliability studies in each year a comprehensive Transmission Plan is not issued to ensure continued reliability of the CAISO controlled grid and to comply with Applicable Reliability Criteria, CAISO Planning Standards and state mandated resource adequacy study requirements. This is further described in Section 24.3.3.1. For purposes of this Section 24, when referring to the comprehensive Transmission Planning Process, the term "the year X planning cycle" will refer to the comprehensive Transmission Planning Process initiated during year X-2 to complete a comprehensive Transmission Plan in year X. For purposes of this Section 24, when referring to the Long-Term Regional Transmission Planning process, the term "the year Y planning cycle" will refer to the Long-Term Regional Transmission Planning process initiated during year Y-3 to complete a comprehensive Long-Term Plan in year Y.

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24.3.1 Inputs to the Unified Planning Assumptions and Study Plan

The CAISO will develop Unified Planning Assumptions and a Study Plan using information and data from the approved Transmission Plans developed in the previous planning cycles. The CAISO will consider the following in the development of the Unified Planning Assumptions and Study Plan:

(a) WECC base cases, as may be modified for the relevant planning horizon;

(b) Transmission upgrades and additions approved by the CAISO in past Transmission Planning Process cycles, including upgrades and additions which the CAISO has determined address transmission needs in the comprehensive Transmission Plan developed in the previous planning cycle;

(c) Long-Term Regional Transmission Facilities approved by the CAISO in past Long-Term

Planning cycles;

(d) Category 2 policy-driven transmission upgrades and additions from a prior planning cycle as described in Section 24.4.6.6;

(e) Location Constrained Resource Interconnection Facilities conditionally approved under Section 24.4.6.3;

(f) Network Upgrades that were not otherwise included in the comprehensive Transmission Plan from the previous biennial cycle, and that meet the qualifying criteria described in Section 24.4.6.5;

(g) Operational solutions validated by the CAISO in the Local Capacity Technical Study under Section 40.3.1;

(h) Policy requirements and directives, as appropriate, including programs initiated by state, federal, municipal and county regulatory agencies;

(i) Energy Resource Areas or similar resource areas identified by Local Regulatory Authorities;

(j) Demand response programs that are proposed for inclusion in the base case or assumptions for the comprehensive Transmission Plan;

(k) Alternative transmission technologies in addition to generation and other non-transmission alternatives that are proposed for inclusion in planning studies as alternatives to or that incorporate transmission additions or upgrades;

(l) Beginning with the 2011/2012 planning cycle, Economic Planning Study requests submitted in comments on the draft Unified Planning Assumptions and Study;

(m) Planned facilities in interconnected Balancing Authority Areas;

(n) The most recent Annual Interregional Information provided by other Planning Regions;

(o) Import Capability expansion requests submitted in comments on the draft Unified Planning Assumptions and Study; and

(p) Subscriber Participating TO transmission facilities, and any generation facilities receiving Subscriber Rights and requesting to interconnect to the CAISO Controlled Grid over Subscriber Participating TO transmission facilities, that have met the following criteria:

1. The Applicant Participating Transmission Owner Agreement has been executed;
2. The generator interconnection agreement with the Subscriber is executed;
3. The Subscriber Participating TO has provided written notice to the CAISO that Construction Activities regarding the Subscriber Participating TO transmission facilities have begun; and
4. Transmission interconnection studies required by the interconnecting Transmission Owner(s) have begun.

(q) Planned and forecasted Large Loads and load growth generally, including:

1. Transmission additions or upgrades planned pursuant to all Participating TO tariff interconnection processes;
2. Transmission additions or upgrades to support public policy requirements or directives; and
3. The most recent Large Load data provided under Section 24.19.1.

* * * * *

24.19 Load Considerations

Throughout the Transmission Planning Process, the CAISO will review transmission additions or upgrades proposed by the Participating TOs as transmission solutions for public policies selected for consideration in the current planning cycle. The Transmission Plan will identify any planned transmission additions or upgrades for Large Loads or other load growth that indicate high operational risk or uncertainty based on NERC Reliability Standards. The CAISO will review all other transmission additions or upgrades for Large Loads and other load growth on a monthly basis pursuant to Section 25.7.

24.19.1 Large Load Data

The Transmission Plan will include data specifically related to Large Loads, including:

1. Aggregate amounts of proposed and completed Large Load additions on the CAISO Controlled Grid by Transmission Zone; and
2. Planned Network Upgrades and their estimated costs needed to accommodate Large Loads,

identified by type of equipment and Network Upgrade.

* * * * *

Section 25

25. Interconnection of Generating Units, Large Loads, and Facilities

25.1 Applicability

This Section 25.1 applies to:

(a) each new Generating Unit that seeks to interconnect to the CAISO Controlled Grid;

(b) each existing Generating Unit connected to the CAISO Controlled Grid that will be modified with a resulting increase in the total capability of the power plant;

(c) each existing Generating Unit connected to the CAISO Controlled Grid that will be modified without increasing the total capability of the power plant but has changed the electrical characteristics of the power plant such that its re-energization may violate Applicable Reliability Criteria;

(d) each existing Generating Unit connected to the CAISO Controlled Grid whose total Generation was previously sold to a Participating TO or on-site End User but whose Generation, or any portion thereof, will now be sold in the wholesale market, subject to Section 25.1.2;

(e) each existing Generating Unit that is a Qualifying Facility and that is converting to a Participating Generator without repowering or reconfiguring the existing Generating Unit, subject to Section 25.1.2;

(f) each existing Generating Unit connected to the CAISO Controlled Grid that proposes to repower its Generating Unit pursuant to Section 25.1.2; and

(g) Generating Units interconnecting to the CAISO Controlled Grid over a Subscriber Participating TO transmission facilities using Subscriber Rights are required to apply for TP Deliverability under Section 25.1 once (1) the Subscriber Participating TO transmission facilities have completed their transmission interconnection studies with all

interconnecting Transmission Owner(s), (2) Subscriber(s) have executed the Generator Interconnection Agreement, (3) the Subscriber Participating TO has committed to proceed with Construction Activities regarding the Subscriber Participating TO transmission facilities, and (4) the applicant provides a notice in writing to the applicable interconnecting Transmission Owners that it is proceeding with Construction Activities. Once these criteria have been completed, the Generating Unit must apply as follows:

(1) each Generating Unit possessing Subscriber Rights and receiving Deliverability from TPP-approved Network Upgrades shall apply for TP Deliverability allocation through the submission of a Subscriber Participating TO-specific deliverability allocation request and does not submit an Interconnection Request under Section 25;

(2) each Generating Unit that does not meet the criteria under Section 25.1(g)(1) shall be treated in accordance with Section 25.1(a).

25.1.1 Interconnection Request and Generating Unit Requirements

The owner of a Generating Unit described in Section 25.1 (a), (b), (c), or (g), or its designee, shall be an Interconnection Customer required to submit an Interconnection Request and comply with Appendix KK unless the Generating Unit will not inject Energy onto the CAISO Controlled Grid and instead serve a co-located End User, as permitted by the Local Regulatory Authority. Subject to the requirements of their tariff and the Local Regulatory Authority, the interconnecting Participating TO for any Generating Units subject to this exemption will ensure the Generating Units have sufficient control technologies, tested and validated by the Participating TO, to ensure no material impact on the CAISO Controlled Grid.

* * * * *

25.5 Modifications to Generating Facilities

Pursuant to the modification provisions of their GIAs, Generating Facilities that have achieved their Commercial Operation Date may make modifications to their Generating Facilities where the CAISO and the Participating TO are notified at least ninety (90) calendar days in advance of commencement of work

and sufficient information is provided such that the CAISO and the Participating TO(s) have determined that Section 25.1 does not apply to the modification.

25.5.1

Prior to making any modification after the Generating Facility's Commercial Operation Date, including the addition of a co-located load or Large Load, the Generating Unit owner must first request that the CAISO evaluate whether Section 25.1 would apply to the modification. In response to the Generating Unit owner's request, the CAISO, in coordination with the affected Participating TO, will evaluate the proposed modification. The CAISO may engage the services of the applicable Participating TO to assess the modification. The CAISO will inform the Generating Unit owner in writing how Section 25.1 would apply to the modification and therefore be denied. Costs incurred by the Participating TO and the CAISO (if any) shall be borne by the party making the request under Section 25.5, and such costs shall be included in any CAISO invoice for modification assessment activities.

The addition of a co-located load or Large Load will not necessarily affect the Qualifying Capacity, Net Qualifying Capacity, Deliverability Status, or eligibility to provide Energy, Ancillary Services, or Resource Adequacy Capacity of a Generating Unit. Any effect will be determined under the otherwise applicable CAISO Tariff, modification results, and Local Regulatory Authority requirements.

* * * * *

25.7 Large Load Interconnections

End Users, including Large Loads, interconnect to the CAISO Controlled Grid pursuant to Participating TO and retail tariffs in accordance with Local Regulatory Authority requirements. The CAISO will not consider any Load a Large Load subject to the CAISO Tariff where the Load is operational or has a complete request with the Participating TO before February 16, 2027 unless and until the Load modifies or increases itself thereafter and would be a Large Load, as dictated by the Participating TO tariffs; or if the Load elects to become a Large Load subject to the CAISO Tariff.

The CAISO will coordinate with the Participating TOs and any Affected System to account for Large Load interconnections to the CAISO Controlled Grid in all Interconnection Studies. Consistent with the RIS,

Participating TO tariffs, and Good Utility Practice, the CAISO and Participating TOs will identify Network Upgrades and Interconnection Facilities best reflecting the combined topology of Interconnection Customer and Large Load interconnections. On a monthly basis, the CAISO will review transmission additions or upgrades planned by the Participating TOs to interconnect Loads and Large Loads pursuant to their Participating TO tariff processes. The CAISO will identify any planned transmission additions or upgrades that indicate high operational risk or uncertainty based on NERC Reliability Standards.

25.7.1 Participating TO Requirements

Participating TOs will apprise the CAISO of Large Load interconnections through their inputs to the Base Case, Interconnection Studies, and Transmission Planning Process. Prior to the synchronization of any Large Load to the CAISO Controlled Grid, the Participating TO will provide the following information for the Large Load: Load type, variable or flat load designation, expected hourly operating profile, points of interconnection and withdrawal, MW capacity, minimum and maximum operating levels, expected CAISO market participation model (if any), curtailment and ramping capabilities, and behind-the-meter generation capacity and characteristics (if any). The Participating TO will require each Large Load to have continuous dynamic disturbance recording data and storage on the high-side of the main power transformer(s) or common point of connection(s) to determine the following electrical quantities for the Large Load:

1. Phase-to-neutral voltage for each phase.
2. Each phase current and the residual or neutral current.
3. Real power and reactive power flows expressed on a three-phase basis corresponding to all circuits where current measurements are required; and
4. Frequency.

The Participating TO also must ensure it can disconnect or otherwise isolate the Large Load in the event of a Contingency, imminent or actual System Emergency, to maintain System Reliability. This Section 25.7.1 and its subsections will not prevent the operation of a load shedding program or Remedial Action Scheme directed or required by the CAISO or applicable Participating TO. Where such programs or schemes require disconnection or reduction of the Large Load, those requirements will supersede the ride-through requirements of this Section.

25.7.1.1 Frequency Ride-Through Requirements

The Participating TO will require each Large Load to remain electrically connected to the CAISO Controlled Grid and ride through system frequency disturbances as specified:

Frequency (Hz)	Minimum Ride-through Requirement
f >61.8	May trip
61.2 < f ≤ 61.8	299 seconds
58.8 ≤ f ≤ 61.2	Continuous operation
57.0 ≤ f < 58.8	299 seconds
f < 57.0	May trip

Frequency measurements used to determine compliance with this Section will be taken at the high-voltage side of the Large Load's main power transformer. Frequency calculations will be based on measurements obtained over an appropriate time window for reliable frequency determination. Instantaneous or single-point frequency measurements will not be used to initiate frequency-based protection or control actions.

25.7.1.2 Voltage Ride-Through Requirements

The Participating TO will require each Large Load to remain electrically connected to the CAISO Controlled Grid and ride through system voltage disturbances as specified:

Voltage (per unit)	Minimum Ride-through Requirement
V > 1.2	May trip
1.1 < V ≤ 1.2	2.0 seconds
0.9 ≤ V ≤ 1.1	Continuous operation
0.7 ≤ V < 0.9	6.0 seconds
0.5 ≤ V < 0.7	3.0 seconds
0.25 ≤ V < 0.5	1.2 seconds
V < 0.25	0.15 seconds

For purposes of this Section, the voltage base used for per-unit calculations will be the nominal phase-to-phase or phase-to-ground transmission system voltage, as applicable. Compliance with the voltage ride-through requirements will be evaluated using the maximum or minimum fundamental-frequency root-mean-square (RMS) voltage, measured phase-to-phase or phase-to-neutral at the high-voltage side of the Large Load's main power transformer, as applicable. Voltage-based protection or control settings that initiate instantaneous tripping based on voltage measurements filtered over periods shorter than one (1) electrical cycle will not be permitted.

25.7.1.3 Post-Fault Active Power Recovery Requirements

The Participating TO will require each Large Load to restore its active power consumption following a system fault or voltage disturbance. Following a fault or voltage disturbance, the Large Load will recover to at least ninety percent (90%) of its pre-disturbance active power consumption within three (3) seconds after the post-fault voltage at the point of interconnection recovers to 0.90 per unit or greater. Where a Remedial Action Scheme requires the disconnection or reduction of all or a portion of the Large Load following a fault, the minimum required active power recovery will be ninety percent (90%) of the remaining pre-disturbance active power consumption after accounting for the load reduction required by the Remedial Action Scheme. Compliance with this requirement will be evaluated based on the aggregate active power consumed from the transmission system by the Large Load at the point of interconnection. Following the initial recovery, sustained or repeated reductions in active power consumption attributable to the disturbance will not be permitted.

25.7.1.4 Ramp-Rate Limitations

The Participating TO will require each Large Load to limit changes in its active power consumption during normal operating conditions such that the average active power ramp rate, measured at the point of interconnection over a rolling ten (10)-minute interval, does not exceed twenty (20) megawatts per minute (MW/min). The ramp-rate limitation will apply to both increases and decreases in active power consumption during normal operation, including startup, shutdown, routine operational changes, and restoration of load following outages. The ramp-rate limitation will not apply to automatic responses to system faults or disturbances that are required for equipment protection or compliance with this Section 25.7.1.

25.7.2 Flexible Interim Load Interconnection (FILI)

The CAISO will facilitate the following flexible Large Load interconnection service provided under Participating TO tariffs:

(a) Flexible Interim Load Interconnection: Curtailable, interim interconnection service for a Large Load provided by the CAISO and Participating TO, enabling the Large Load to interconnect prior to the completion of the Large Load's Network Upgrades or Interconnection Facilities.

Prior to the energization of the Large Load, the CAISO, Participating TO, and Large Load or its authorized

agent will execute an agreement describing the circumstances in which the Large Load receiving FILI may be temporarily curtailed, and the mechanism used to perform the curtailment. At a minimum, the agreement will specify:

(a) The circumstances, Contingencies, or operating conditions in which the Large Load would be curtailed

(b) The mechanism used to perform the curtailment

(c) The entity responsible for performing the curtailment

(d) The notification method, response time, duration, restoration, testing, and verification requirements

(e) Interim operating limits both in and out of curtailable events

(f) The Network Upgrades or Interconnection Facilities required to conclude the FILI

The CAISO will post these agreements on the CAISO Website. The CAISO Base Case, Full Network Model, and Operating Procedures will account for such Large Loads as applicable.

25.7.3 Load Serving Entity Scheduling Coordinator Requirements

The Scheduling Coordinator representing the Load Serving Entity for the Large Load will include the Large Load in its Bids, Scheduled Demand, and Meter Data, as applicable, for that area. The Scheduling Coordinator also must provide the CAISO the following, specific to each Large Load it represents:

1. Daily and hourly forecast data otherwise required for the CAISO Forecast of CAISO Demand;
2. Any real-time, material deviations from provided forecasts, including changes resulting from energization activities, material operational changes, curtailments, Outages, derates, operating limits, operating envelopes, or co-located generation impacts that materially affect expected Demand;
3. Operational status and real-time consumption to the CAISO in accordance with the CAISO's standards for direct telemetry and consistent with the requirement for telemetry set forth in Section 7.6.1.

Without limitation, the applicable Load Serving Entity, Utility Distribution Company, MSS Operator, Large Load, and Scheduling Coordinator may satisfy the requirements of this Section through coordinated

arrangements that clearly assign each CAISO Tariff obligation and avoid duplicative submissions. The applicable arrangement must identify the Scheduling Coordinator responsible for submitting Bids, Scheduled Demand, Meter Data, forecasts, and real-time operational updates for the Large Load. The CAISO must verify the arrangement will comply with this Section before its use.

25.7.3.1 Large Load Scheduling Coordinator Requirements

Consistent with CAISO Tariff and Local Regulatory Authority requirements, Large Loads may participate in the CAISO Markets solely, or in aggregations with other resources, as their own Load Serving Entity, a Non-Generator Resource, or a Participating Load. Such Large Loads may elect to comply with the requirements of Section 25.7.3 and participate in the CAISO Markets through their own Scheduling Coordinator in lieu of their Load Serving Entity Scheduling Coordinator. A Large Load participating as a Proxy Demand Resource or Reliability Demand Response Resource will have the Load Serving Entity Scheduling Coordinator comply with Section 25.7.3 and submit Scheduled Demand including the Large Load, but may have the Demand Response Provider or other Scheduling Coordinator comply with Section 4.13.

Nothing in this Section 25 or the CAISO Tariff will affect the eligibility of an End-Use Customer to be treated as a Direct Access End-User, consistent with Section 2.2 of the CAISO Tariff.

25.7.4 Reliability Events

After a disturbance or other reliability event involving a Large Load, any associated Interconnection Customer, Scheduling Coordinator, and Participating TO must comply with any CAISO, Regional Entity, or Reliability Coordinator data request related to the event.

25.7.5 Energy Storage and Large Loads

Loads, Large Loads, and energy storage may be co-located. Consistent with Section 10.1.3.2, to avoid the commingling of wholesale and retail withdrawals, Interconnection Customers must ensure loads and Large Loads are metered separately and independently from any co-located energy storage participating in the CAISO Markets. Loads and Large Loads nonetheless may net any withdrawals against non-participating generation and storage, as permitted by the Local Regulatory Authority. Nothing in this Section will contradict the netting permitted by Section 10.1.3 of the CAISO Tariff.

25.7.6 Co-located Generating Units and Large Loads

The CAISO and Participating TOs will conduct all Interconnection Studies for Generating Units co-locating with Large Loads to account for their net impact on the CAISO Controlled Grid, as requested by the Interconnection Customer. Interconnection Customers for such configurations may avail themselves of all rights and services in the RIS and CAISO Tariff. The CAISO and Participating TO will produce Interconnection Study results reflecting the combined presence of the Generating Units and co-located Large Loads. The Interconnection Service Capacity and Deliverability Status will reflect the combined operation established in the Interconnection Studies. The CAISO and Participating TO will memorialize the combined operation in the GIA. To be considered in the Cluster Study, the Interconnection Customer must have submitted the request for the interconnection of the Large Load to the Participating TO pursuant to its tariff by the close of the CAISO's Cluster Application Window.

For any conflict between the CAISO tariff and the Participating TO tariff pertaining to the interconnection of the Generating Unit, the CAISO tariff will apply. For any conflict between the CAISO tariff and the Participating TO tariff pertaining to the interconnection of the Large Load, the Participating TO tariff will apply.

Without limitation, Interconnection Customers with co-located Generating Units and Large Loads must make all applicable Interconnection Study Deposits, Commercial Readiness Deposits, and GIA Deposits in the RIS and CAISO Tariff. Network Upgrade and Interconnection Facility assignments and cost allocations pursuant to the RIS will assume they are for the Generating Facility unless the CAISO and Participating TO agree that the Network Upgrade or Interconnection Facility is for the Large Load only. Nothing in the CAISO Tariff should be interpreted to contradict or exempt the Large Load from its cost responsibility obligations pursuant to the Participating TO tariff.

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Appendix A

- Flexible Interim Load Interconnection (FILI)

Curtailable, interim interconnection service for a Large Load provided by the CAISO and Participating TO,

enabling the Large Load to interconnect prior to the completion of the Large Load’s Network Upgrades or Interconnection Facilities.

- Large Load

An End User located at a single site behind one or more points of interconnection to the CAISO Controlled Grid, and that has a peak load of 50 MW or greater. The CAISO will not consider any Load a Large Load subject to the CAISO Tariff where the Load is operational or has a complete request with the Participating TO before February 16, 2027 unless and until the Load modifies or increases itself thereafter and would be a Large Load, as dictated by the Participating TO tariffs; or if the Load elects to become a Large Load subject to the CAISO Tariff.

Appendix KK

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2.4 Interconnection Service and Studies

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2.4.4 Large Loads

End Users, including Large Loads, interconnect to the CAISO Controlled Grid pursuant to Participating TO tariffs. The CAISO will coordinate with the Participating TOs to account for Large Load interconnections to the CAISO Controlled Grid in all Interconnection Studies. Consistent with this RIS, Participating TO tariffs, and Good Utility Practice, the CAISO and Participating TOs will identify Network Upgrades and Interconnection Facilities best reflecting the combined topology of Interconnection Customer and Large Load interconnections. As described in Section 25.7 of the CAISO tariff, the CAISO and Participating TOs will conduct all Interconnection Studies for Generating Units co-locating with Large Loads to account for their net impact on the CAISO Controlled Grid, as requested by the Interconnection Customer. Interconnection Customers for such configurations may avail themselves of all rights and services in this RIS. For any conflict between the CAISO tariff and the Participating TO tariff pertaining to the interconnection of the Generating Unit, the CAISO tariff will apply. For any conflict between the CAISO tariff and the Participating TO tariff pertaining to the interconnection of the Large Load, the Participating TO tariff will apply.

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Section 3 Interconnection Requests

3.1 General

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Interconnection Customers may request Interconnection Service Capacity below the Generating Facility Capacity, including to account for co-located Large Load. The CAISO will study these requests for Interconnection Service at the level of Interconnection Service Capacity requested for purposes of Interconnection Studies, Network Upgrades, and associated costs. If the Generating Facility Capacity requires additional Network Upgrades beyond the Interconnection Service Capacity, the CAISO will provide a detailed explanation of why the additional Network Upgrades are necessary. Any Interconnection Facility and/or Network Upgrade cost required for safety and reliability will be assigned to the Interconnection Customer and eligible for reimbursement consistent with the treatment of Interconnection Facilities and Network Upgrade provided in this RIS. Interconnection Customers may be subject to additional control technologies, as well as testing and validation of those technologies consistent with Article 6 of the GIA and Article 2 of the SGIA. The necessary control technologies and protection systems shall be established in Appendix C of that executed, or requested to be filed unexecuted, GIA.

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3.6 Internet Posting

The CAISO will maintain on the CAISO Website a list of all Interconnection Requests. The list will identify, for each Interconnection Request: (i) the maximum summer and winter megawatt electrical output; (ii) the location by county and state; (iii) the station or transmission line or lines where the interconnection will be made; (iv) the most recent projected Commercial Operation Date; (v) the status of the Interconnection Request, including whether it is active or withdrawn; (vi) the availability of any studies related to the Interconnection Request; (vii) the date of the Interconnection Request; (viii) the type of Generating Facility to be constructed (e.g., combined cycle, combustion turbine, wind turbine, and fuel type); (ix) requested Deliverability statuses, (x) project name, and (xi) MW capacity of any planned co-located load, excluding

Station Power load. Except in the case of an Affiliate, the list will not disclose the identity of the Interconnection Customer until the Interconnection Customer executes a GIA or requests that the applicable Participating TO(s) and the CAISO file an unexecuted GIA with FERC. The CAISO shall post on the CAISO Website an advance notice whenever a Scoping Meeting will be held with an Affiliate of a Participating TO.

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6.7.2.9 Co-located Load Modifications

The Interconnection Customer may request, and the CAISO and Participating TO will evaluate, the removal of co-located load from an Interconnection Request if the removal does not increase the requested Interconnection Service level. The CAISO and Participating TO must evaluate such modifications prior to deeming them a Material Modification, but only if the Interconnection Customer submits them prior to the return of the executed Interconnection Facilities Study Agreement by the Interconnection Customer to the CAISO. Interconnection Customers seeking to add co-located load to an Interconnection Request after the commencement of the Cluster Study may request to do so pursuant to Section 6.7.2.3, including as a request to downsize the Interconnection Service level pursuant to Section 6.7.2.7. For any co-located load addition or removal pursuant to the Participating TO tariff, if the CAISO and Participating TO determine that the change is a Material Modification or otherwise cannot be reflected in the Generating Facility's Interconnection Study results, the CAISO and Participating TO will note the change in the GIA, but without modifying the Interconnection Study results.

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Attachment B – Tariff Redlines

Large Loads Tariff Amendment

California Independent System Operator Corporation

November 16, 2026

Note: Grey highlighted text represents tariff revisions pending approval in docket number ER26-704.

Section 4

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Section 4.19 Large Loads

Consistent with any Local Regulatory Authority requirements, Large Loads and Loads may participate in the CAISO Markets using any model where they are capable of complying with the CAISO Tariff requirements, including without limitation as Proxy Demand Resources, Reliability Demand Response Resources, Participating Loads, Load-Serving Entities, and Non-Generator Resources. Large Loads may participate alone or in permissible aggregations, including with co-located Generating Units. Large Loads and Loads participating in the CAISO Markets are eligible for all rights and subject to all obligations of the CAISO Tariff under those participation models. Large Loads and Loads are eligible to provide, without limitation, Demand Response Energy, Curtailable Demand, Resource Adequacy Capacity, and Ancillary Services consistent with their participation model and subject to the requirements of the CAISO Tariff.

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Section 11

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Section 11.37 Large Load Requirements

The Scheduling Coordinator representing any Large Load pursuant to Section 25.7.3 will provide the CAISO Settlement Quality Meter Data on the gross Demand of the Large Load, excluding any offsetting Energy, including from co-located or behind-the-meter generation. The CAISO will charge the applicable Scheduling Coordinator based on this Meter Data the hourly user rate for Regulation Down Reserve,

Regulation Up Reserve, and Reliability Services Costs. In calculating the rates for these charges, the CAISO will include all separately submitted volumes for Large Loads.

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Section 24

24. Comprehensive Transmission Planning Process

24.1 Overview

The CAISO will develop a comprehensive Transmission Plan and approve transmission solutions using the Transmission Planning Process set forth in this Section 24. For purposes of this Section 24, transmission solutions include both entirely new transmission facilities and upgrades or additions to existing transmission facilities that are proposed, considered, and/or specified in the comprehensive Transmission Plan during Phase 2 to meet an identified need determined by the CAISO. The CAISO will consider the use of alternative transmission technologies including dynamic line ratings, advanced power flow control devices, advanced conductors, and transmission switching when evaluating transmission solutions for new regional transmission facilities, Large Loads, upgrades to existing transmission facilities, and Long-Term Regional Transmission Facilities. Alternatives to transmission solutions are referred to as non-transmission solutions. Solutions to meet an identified need can be either transmission solutions or non-transmission solutions. The CAISO will analyze the need for transmission solutions in accordance with the methodologies and criteria set forth in this Section 24, the Transmission Control Agreement, and the applicable Business Practice Manuals. The comprehensive Transmission Plan will identify Merchant Transmission Facilities meeting the requirements for inclusion in the Transmission Plan and transmission solutions needed (1) to maintain System Reliability; (2) to satisfy the requirements of a Location Constrained Resource Interconnection Facility; (3) to maintain the simultaneous feasibility of allocated Long-Term CRRs; (4) as additional components or expansions to LGIP Network Upgrades are identified pursuant to Section 24.4.6.5; (5) to meet state, municipal, county and federal policy requirements and directives, including renewable portfolio standards policies; and (6) to reduce congestion costs, production supply costs, transmission losses, or other electric supply costs resulting from improved

access to cost-effective resources.

Beginning in 2027, the CAISO will transition to two complementary transmission planning cycles: (a) a comprehensive transmission plan performed biennially (every two years) with the first biennial comprehensive transmission plan to be issued in 2030; and (b) a Long-Term Regional Transmission Plan performed every four years, with a plan first issued in 2030, and further described in Section 24.11. Additionally, the CAISO will perform reliability studies in each year a comprehensive Transmission Plan is not issued to ensure continued reliability of the CAISO controlled grid and to comply with Applicable Reliability Criteria, CAISO Planning Standards and state mandated resource adequacy study requirements. This is further described in Section 24.3.3.1. For purposes of this Section 24, when referring to the comprehensive Transmission Planning Process, the term "the year X planning cycle" will refer to the comprehensive Transmission Planning Process initiated during year X-2 to complete a comprehensive Transmission Plan in year X. For purposes of this Section 24, when referring to the Long-Term Regional Transmission Planning process, the term "the year Y planning cycle" will refer to the Long-Term Regional Transmission Planning process initiated during year Y-3 to complete a comprehensive Long-Term Plan in year Y.

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24.3.1 Inputs to the Unified Planning Assumptions and Study Plan

The CAISO will develop Unified Planning Assumptions and a Study Plan using information and data from the approved Transmission Plans developed in the previous planning cycles. The CAISO will consider the following in the development of the Unified Planning Assumptions and Study Plan:

(a) WECC base cases, as may be modified for the relevant planning horizon;

(b) Transmission upgrades and additions approved by the CAISO in past Transmission Planning Process cycles, including upgrades and additions which the CAISO has determined address transmission needs in the comprehensive Transmission Plan developed in the previous planning cycle;

(c) Long-Term Regional Transmission Facilities approved by the CAISO in past Long-Term

Planning cycles;

(d) Category 2 policy-driven transmission upgrades and additions from a prior planning cycle as described in Section 24.4.6.6;

(e) Location Constrained Resource Interconnection Facilities conditionally approved under Section 24.4.6.3;

(f) Network Upgrades that were not otherwise included in the comprehensive Transmission Plan from the previous biennial cycle, and that meet the qualifying criteria described in Section 24.4.6.5;

(g) Operational solutions validated by the CAISO in the Local Capacity Technical Study under Section 40.3.1;

(h) Policy requirements and directives, as appropriate, including programs initiated by state, federal, municipal and county regulatory agencies;

(i) Energy Resource Areas or similar resource areas identified by Local Regulatory Authorities;

(j) Demand response programs that are proposed for inclusion in the base case or assumptions for the comprehensive Transmission Plan;

(k) Alternative transmission technologies in addition to generation and other non-transmission alternatives that are proposed for inclusion in planning studies as alternatives to or that incorporate transmission additions or upgrades;

(l) Beginning with the 2011/2012 planning cycle, Economic Planning Study requests submitted in comments on the draft Unified Planning Assumptions and Study;

(m) Planned facilities in interconnected Balancing Authority Areas;

(n) The most recent Annual Interregional Information provided by other Planning Regions;

(o) Import Capability expansion requests submitted in comments on the draft Unified Planning Assumptions and Study; and

(p) Subscriber Participating TO transmission facilities, and any generation facilities receiving Subscriber Rights and requesting to interconnect to the CAISO Controlled Grid over Subscriber Participating TO transmission facilities, that have met the following criteria:

1. The Applicant Participating Transmission Owner Agreement has been executed;
2. The generator interconnection agreement with the Subscriber is executed;
3. The Subscriber Participating TO has provided written notice to the CAISO that Construction Activities regarding the Subscriber Participating TO transmission facilities have begun; and
4. Transmission interconnection studies required by the interconnecting Transmission Owner(s) have begun.

(q) Planned and forecasted Large Loads and load growth generally, including:

1. Transmission additions or upgrades planned pursuant to all Participating TO tariff interconnection processes;
2. Transmission additions or upgrades to support public policy requirements or directives; and
3. The most recent Large Load data provided under Section 24.19.1.

* * * * *

24.19 Load Considerations

Throughout the Transmission Planning Process, the CAISO will review transmission additions or upgrades proposed by the Participating TOs as transmission solutions for public policies selected for consideration in the current planning cycle. The Transmission Plan will identify any planned transmission additions or upgrades for Large Loads or other load growth that indicate high operational risk or uncertainty based on NERC Reliability Standards. The CAISO will review all other transmission additions or upgrades for Large Loads and other load growth on a monthly basis pursuant to Section 25.7.

24.19.1 Large Load Data

The Transmission Plan will include data specifically related to Large Loads, including:

1. Aggregate amounts of proposed and completed Large Load additions on the CAISO Controlled Grid by Transmission Zone; and
2. Planned Network Upgrades and their estimated costs needed to accommodate Large Loads,

identified by type of equipment and Network Upgrade.

* * * * *

Section 25

25. Interconnection of Generating Units, Large Loads, and Facilities

25.1 Applicability

This Section 25.1 applies to:

(a) each new Generating Unit that seeks to interconnect to the CAISO Controlled Grid;

(b) each existing Generating Unit connected to the CAISO Controlled Grid that will be modified with a resulting increase in the total capability of the power plant;

(c) each existing Generating Unit connected to the CAISO Controlled Grid that will be modified without increasing the total capability of the power plant but has changed the electrical characteristics of the power plant such that its re-energization may violate Applicable Reliability Criteria;

(d) each existing Generating Unit connected to the CAISO Controlled Grid whose total Generation was previously sold to a Participating TO or on-site ~~customer~~ End User but whose Generation, or any portion thereof, will now be sold in the wholesale market, subject to Section 25.1.2;

(e) each existing Generating Unit that is a Qualifying Facility and that is converting to a Participating Generator without repowering or reconfiguring the existing Generating Unit, subject to Section 25.1.2;

(f) each existing Generating Unit connected to the CAISO Controlled Grid that proposes to repower its Generating Unit pursuant to Section 25.1.2; and

(g) Generating Units interconnecting to the CAISO Controlled Grid over a Subscriber Participating TO transmission facilities using Subscriber Rights are required to apply for TP Deliverability under Section 25.1 once (1) the Subscriber Participating TO transmission facilities have completed their transmission interconnection studies with all

interconnecting Transmission Owner(s), (2) Subscriber(s) have executed the Generator Interconnection Agreement, (3) the Subscriber Participating TO has committed to proceed with Construction Activities regarding the Subscriber Participating TO transmission facilities, and (4) the applicant provides a notice in writing to the applicable interconnecting Transmission Owners that it is proceeding with Construction Activities. Once these criteria have been completed, the Generating Unit must apply as follows:

(1) each Generating Unit possessing Subscriber Rights and receiving Deliverability from TPP-approved Network Upgrades shall apply for TP Deliverability allocation through the submission of a Subscriber Participating TO-specific deliverability allocation request and does not submit an Interconnection Request under Section 25;

(2) each Generating Unit that does not meet the criteria under Section 25.1(g)(1) shall be treated in accordance with Section 25.1(a).

25.1.1 Interconnection Request and Generating Unit Requirements

The owner of a Generating Unit described in Section 25.1 (a), (b), (c), or (g), or its designee, shall be an Interconnection Customer required to submit an Interconnection Request and comply with Appendix KK unless the Generating Unit will not inject Energy onto the CAISO Controlled Grid and instead serve a co-located End User, as permitted by the Local Regulatory Authority. Subject to the requirements of their tariff and the Local Regulatory Authority, the interconnecting Participating TO for any Generating Units subject to this exemption will ensure the Generating Units have sufficient control technologies, tested and validated by the Participating TO, to ensure no material impact on the CAISO Controlled Grid.

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25.5 Modifications to Generating Facilities

Pursuant to the modification provisions of their GIAs, Generating Facilities that have achieved their Commercial Operation Date may make modifications to their Generating Facilities where the CAISO and the Participating TO are notified at least ninety (90) calendar days in advance of commencement of work

and sufficient information is provided such that the CAISO and the Participating TO(s) have determined that Section 25.1 does not apply to the modification.

25.5.1

Prior to making any modification after the Generating Facility's Commercial Operation Date, including the addition of a co-located load or Large Load, the Generating Unit owner must first request that the CAISO evaluate whether Section 25.1 would apply to the modification. In response to the Generating Unit owner's request, the CAISO, in coordination with the affected Participating TO, will evaluate the proposed modification. The CAISO may engage the services of the applicable Participating TO to assess the modification. The CAISO will inform the Generating Unit owner in writing ~~whether~~ how Section 25.1 would apply to the modification and therefore be denied. Costs incurred by the Participating TO and the CAISO (if any) shall be borne by the party making the request under Section 25.5, and such costs shall be included in any CAISO invoice for modification assessment activities.

The addition of a co-located load or Large Load will not necessarily affect the Qualifying Capacity, Net Qualifying Capacity, Deliverability Status, or eligibility to provide Energy, Ancillary Services, or Resource Adequacy Capacity of a Generating Unit. Any effect will be determined under the otherwise applicable CAISO Tariff, modification results, and Local Regulatory Authority requirements.

* * * * *

25.7 Large Load Interconnections

End Users, including Large Loads, interconnect to the CAISO Controlled Grid pursuant to Participating TO and retail tariffs in accordance with Local Regulatory Authority requirements. The CAISO will not consider any Load a Large Load subject to the CAISO Tariff where the Load is operational or has a complete request with the Participating TO before February 16, 2027 unless and until the Load modifies or increases itself thereafter and would be a Large Load, as dictated by the Participating TO tariffs; or if the Load elects to become a Large Load subject to the CAISO Tariff.

The CAISO will coordinate with the Participating TOs and any Affected System to account for Large Load interconnections to the CAISO Controlled Grid in all Interconnection Studies. Consistent with the RIS,

Participating TO tariffs, and Good Utility Practice, the CAISO and Participating TOs will identify Network Upgrades and Interconnection Facilities best reflecting the combined topology of Interconnection Customer and Large Load interconnections. On a monthly basis, the CAISO will review transmission additions or upgrades planned by the Participating TOs to interconnect Loads and Large Loads pursuant to their Participating TO tariff processes. The CAISO will identify any planned transmission additions or upgrades that indicate high operational risk or uncertainty based on NERC Reliability Standards.

25.7.1 Participating TO Requirements

Participating TOs will apprise the CAISO of Large Load interconnections through their inputs to the Base Case, Interconnection Studies, and Transmission Planning Process. Prior to the synchronization of any Large Load to the CAISO Controlled Grid, the Participating TO will provide the following information for the Large Load: Load type, variable or flat load designation, expected hourly operating profile, points of interconnection and withdrawal, MW capacity, minimum and maximum operating levels, expected CAISO market participation model (if any), curtailment and ramping capabilities, and behind-the-meter generation capacity and characteristics (if any). The Participating TO will require each Large Load to have continuous dynamic disturbance recording data and storage on the high-side of the main power transformer(s) or common point of connection(s) to determine the following electrical quantities for the Large Load:

1. Phase-to-neutral voltage for each phase.
2. Each phase current and the residual or neutral current.
3. Real power and reactive power flows expressed on a three-phase basis corresponding to all circuits where current measurements are required; and
4. Frequency.

The Participating TO also must ensure it can disconnect or otherwise isolate the Large Load in the event of a Contingency, imminent or actual System Emergency, to maintain System Reliability. This Section 25.7.1 and its subsections will not prevent the operation of a load shedding program or Remedial Action Scheme directed or required by the CAISO or applicable Participating TO. Where such programs or schemes require disconnection or reduction of the Large Load, those requirements will supersede the ride-through requirements of this Section.

25.7.1.1 Frequency Ride-Through Requirements

The Participating TO will require each Large Load to remain electrically connected to the CAISO Controlled Grid and ride through system frequency disturbances as specified:

Frequency (Hz)	Minimum Ride-through Requirement
f >61.8	May trip
61.2 < f ≤ 61.8	299 seconds
58.8 ≤ f ≤ 61.2	Continuous operation
57.0 ≤ f < 58.8	299 seconds
f < 57.0	May trip

Frequency measurements used to determine compliance with this Section will be taken at the high-voltage side of the Large Load's main power transformer. Frequency calculations will be based on measurements obtained over an appropriate time window for reliable frequency determination. Instantaneous or single-point frequency measurements will not be used to initiate frequency-based protection or control actions.

25.7.1.2 Voltage Ride-Through Requirements

The Participating TO will require each Large Load to remain electrically connected to the CAISO Controlled Grid and ride through system voltage disturbances as specified:

Voltage (per unit)	Minimum Ride-through Requirement
V > 1.2	May trip
1.1 < V ≤ 1.2	2.0 seconds
0.9 ≤ V ≤ 1.1	Continuous operation
0.7 ≤ V < 0.9	6.0 seconds
0.5 ≤ V < 0.7	3.0 seconds
0.25 ≤ V < 0.5	1.2 seconds
V < 0.25	0.15 seconds

For purposes of this Section, the voltage base used for per-unit calculations will be the nominal phase-to-phase or phase-to-ground transmission system voltage, as applicable. Compliance with the voltage ride-through requirements will be evaluated using the maximum or minimum fundamental-frequency root-mean-square (RMS) voltage, measured phase-to-phase or phase-to-neutral at the high-voltage side of the Large Load's main power transformer, as applicable. Voltage-based protection or control settings that initiate instantaneous tripping based on voltage measurements filtered over periods shorter than one (1) electrical cycle will not be permitted.

25.7.1.3 Post-Fault Active Power Recovery Requirements

The Participating TO will require each Large Load to restore its active power consumption following a system fault or voltage disturbance. Following a fault or voltage disturbance, the Large Load will recover to at least ninety percent (90%) of its pre-disturbance active power consumption within three (3) seconds after the post-fault voltage at the point of interconnection recovers to 0.90 per unit or greater. Where a Remedial Action Scheme requires the disconnection or reduction of all or a portion of the Large Load following a fault, the minimum required active power recovery will be ninety percent (90%) of the remaining pre-disturbance active power consumption after accounting for the load reduction required by the Remedial Action Scheme. Compliance with this requirement will be evaluated based on the aggregate active power consumed from the transmission system by the Large Load at the point of interconnection. Following the initial recovery, sustained or repeated reductions in active power consumption attributable to the disturbance will not be permitted.

25.7.1.4 Ramp-Rate Limitations

The Participating TO will require each Large Load to limit changes in its active power consumption during normal operating conditions such that the average active power ramp rate, measured at the point of interconnection over a rolling ten (10)-minute interval, does not exceed twenty (20) megawatts per minute (MW/min). The ramp-rate limitation will apply to both increases and decreases in active power consumption during normal operation, including startup, shutdown, routine operational changes, and restoration of load following outages. The ramp-rate limitation will not apply to automatic responses to system faults or disturbances that are required for equipment protection or compliance with this Section 25.7.1.

25.7.2 Flexible Interim Load Interconnection (FILI)

The CAISO will facilitate the following flexible Large Load interconnection service provided under Participating TO tariffs:

(a) Flexible Interim Load Interconnection: Curtailable, interim interconnection service for a Large Load provided by the CAISO and Participating TO, enabling the Large Load to interconnect prior to the completion of the Large Load's Network Upgrades or Interconnection Facilities.

Prior to the energization of the Large Load, the CAISO, Participating TO, and Large Load or its authorized

agent will execute an agreement describing the circumstances in which the Large Load receiving FILI may be temporarily curtailed, and the mechanism used to perform the curtailment. At a minimum, the agreement will specify:

(a) The circumstances, Contingencies, or operating conditions in which the Large Load would be curtailed

(b) The mechanism used to perform the curtailment

(c) The entity responsible for performing the curtailment

(d) The notification method, response time, duration, restoration, testing, and verification requirements

(e) Interim operating limits both in and out of curtailable events

(f) The Network Upgrades or Interconnection Facilities required to conclude the FILI

The CAISO will post these agreements on the CAISO Website. The CAISO Base Case, Full Network Model, and Operating Procedures will account for such Large Loads as applicable.

25.7.3 Load Serving Entity Scheduling Coordinator Requirements

The Scheduling Coordinator representing the Load Serving Entity for the Large Load will include the Large Load in its Bids, Scheduled Demand, and Meter Data, as applicable, for that area. The Scheduling Coordinator also must provide the CAISO the following, specific to each Large Load it represents:

1. Daily and hourly forecast data otherwise required for the CAISO Forecast of CAISO Demand;
2. Any real-time, material deviations from provided forecasts, including changes resulting from energization activities, material operational changes, curtailments, Outages, derates, operating limits, operating envelopes, or co-located generation impacts that materially affect expected Demand;
3. Operational status and real-time consumption to the CAISO in accordance with the CAISO's standards for direct telemetry and consistent with the requirement for telemetry set forth in Section 7.6.1.

Without limitation, the applicable Load Serving Entity, Utility Distribution Company, MSS Operator, Large Load, and Scheduling Coordinator may satisfy the requirements of this Section through coordinated

arrangements that clearly assign each CAISO Tariff obligation and avoid duplicative submissions. The applicable arrangement must identify the Scheduling Coordinator responsible for submitting Bids, Scheduled Demand, Meter Data, forecasts, and real-time operational updates for the Large Load. The CAISO must verify the arrangement will comply with this Section before its use.

25.7.3.1 Large Load Scheduling Coordinator Requirements

Consistent with CAISO Tariff and Local Regulatory Authority requirements, Large Loads may participate in the CAISO Markets solely, or in aggregations with other resources, as their own Load Serving Entity, a Non-Generator Resource, or a Participating Load. Such Large Loads may elect to comply with the requirements of Section 25.7.3 and participate in the CAISO Markets through their own Scheduling Coordinator in lieu of their Load Serving Entity Scheduling Coordinator. A Large Load participating as a Proxy Demand Resource or Reliability Demand Response Resource will have the Load Serving Entity Scheduling Coordinator comply with Section 25.7.3 and submit Scheduled Demand including the Large Load, but may have the Demand Response Provider or other Scheduling Coordinator comply with Section 4.13.

Nothing in this Section 25 or the CAISO Tariff will affect the eligibility of an End-Use Customer to be treated as a Direct Access End-User, consistent with Section 2.2 of the CAISO Tariff.

25.7.4 Reliability Events

After a disturbance or other reliability event involving a Large Load, any associated Interconnection Customer, Scheduling Coordinator, and Participating TO must comply with any CAISO, Regional Entity, or Reliability Coordinator data request related to the event.

25.7.5 Energy Storage and Large Loads

Loads, Large Loads, and energy storage may be co-located. Consistent with Section 10.1.3.2, to avoid the commingling of wholesale and retail withdrawals, Interconnection Customers must ensure loads and Large Loads are metered separately and independently from any co-located energy storage participating in the CAISO Markets. Loads and Large Loads nonetheless may net any withdrawals against non-participating generation and storage, as permitted by the Local Regulatory Authority. Nothing in this Section will contradict the netting permitted by Section 10.1.3 of the CAISO Tariff.

25.7.6 Co-located Generating Units and Large Loads

The CAISO and Participating TOs will conduct all Interconnection Studies for Generating Units co-locating with Large Loads to account for their net impact on the CAISO Controlled Grid, as requested by the Interconnection Customer. Interconnection Customers for such configurations may avail themselves of all rights and services in the RIS and CAISO Tariff. The CAISO and Participating TO will produce Interconnection Study results reflecting the combined presence of the Generating Units and co-located Large Loads. The Interconnection Service Capacity and Deliverability Status will reflect the combined operation established in the Interconnection Studies. The CAISO and Participating TO will memorialize the combined operation in the GIA. To be considered in the Cluster Study, the Interconnection Customer must have submitted the request for the interconnection of the Large Load to the Participating TO pursuant to its tariff by the close of the CAISO's Cluster Application Window.

For any conflict between the CAISO tariff and the Participating TO tariff pertaining to the interconnection of the Generating Unit, the CAISO tariff will apply. For any conflict between the CAISO tariff and the Participating TO tariff pertaining to the interconnection of the Large Load, the Participating TO tariff will apply.

Without limitation, Interconnection Customers with co-located Generating Units and Large Loads must make all applicable Interconnection Study Deposits, Commercial Readiness Deposits, and GIA Deposits in the RIS and CAISO Tariff. Network Upgrade and Interconnection Facility assignments and cost allocations pursuant to the RIS will assume they are for the Generating Facility unless the CAISO and Participating TO agree that the Network Upgrade or Interconnection Facility is for the Large Load only. Nothing in the CAISO Tariff should be interpreted to contradict or exempt the Large Load from its cost responsibility obligations pursuant to the Participating TO tariff.

* * * * *

Appendix A

- Flexible Interim Load Interconnection (FILI)

Curtailable, interim interconnection service for a Large Load provided by the CAISO and Participating TO,

enabling the Large Load to interconnect prior to the completion of the Large Load's Network Upgrades or Interconnection Facilities.

- Large Load

An End User located at a single site behind one or more points of interconnection to the CAISO Controlled Grid, and that has a peak load of 50 MW or greater. The CAISO will not consider any Load a Large Load subject to the CAISO Tariff where the Load is operational or has a complete request with the Participating TO before February 16, 2027 unless and until the Load modifies or increases itself thereafter and would be a Large Load, as dictated by the Participating TO tariffs; or if the Load elects to become a Large Load subject to the CAISO Tariff.

Appendix KK

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2.4 Interconnection Service and Studies

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2.4.4 Large Loads

End Users, including Large Loads, interconnect to the CAISO Controlled Grid pursuant to Participating TO tariffs. The CAISO will coordinate with the Participating TOs to account for Large Load interconnections to the CAISO Controlled Grid in all Interconnection Studies. Consistent with this RIS, Participating TO tariffs, and Good Utility Practice, the CAISO and Participating TOs will identify Network Upgrades and Interconnection Facilities best reflecting the combined topology of Interconnection Customer and Large Load interconnections. As described in Section 25.7 of the CAISO tariff, the CAISO and Participating TOs will conduct all Interconnection Studies for Generating Units co-locating with Large Loads to account for their net impact on the CAISO Controlled Grid, as requested by the Interconnection Customer. Interconnection Customers for such configurations may avail themselves of all rights and services in this RIS. For any conflict between the CAISO tariff and the Participating TO tariff pertaining to the interconnection of the Generating Unit, the CAISO tariff will apply. For any conflict between the CAISO tariff and the Participating TO tariff pertaining to the interconnection of the Large Load, the Participating TO tariff will apply.

* * * * *

Section 3 Interconnection Requests

3.1 General

* * * * *

Interconnection Customers may request Interconnection Service Capacity below the Generating Facility Capacity, including to account for co-located Large Load. The CAISO will study these requests for Interconnection Service at the level of Interconnection Service Capacity requested for purposes of Interconnection Studies, Network Upgrades, and associated costs. If the Generating Facility Capacity requires additional Network Upgrades beyond the Interconnection Service Capacity, the CAISO will provide a detailed explanation of why the additional Network Upgrades are necessary. Any Interconnection Facility and/or Network Upgrade cost required for safety and reliability will be assigned to the Interconnection Customer and eligible for reimbursement consistent with the treatment of Interconnection Facilities and Network Upgrade provided in this RIS. Interconnection Customers may be subject to additional control technologies, as well as testing and validation of those technologies consistent with Article 6 of the GIA and Article 2 of the SGIA. The necessary control technologies and protection systems shall be established in Appendix C of that executed, or requested to be filed unexecuted, GIA.

* * * * *

3.6 Internet Posting

The CAISO will maintain on the CAISO Website a list of all Interconnection Requests. The list will identify, for each Interconnection Request: (i) the maximum summer and winter megawatt electrical output; (ii) the location by county and state; (iii) the station or transmission line or lines where the interconnection will be made; (iv) the most recent projected Commercial Operation Date; (v) the status of the Interconnection Request, including whether it is active or withdrawn; (vi) the availability of any studies related to the Interconnection Request; (vii) the date of the Interconnection Request; (viii) the type of Generating Facility to be constructed (e.g., combined cycle, combustion turbine, wind turbine, and fuel type); (ix) requested Deliverability statuses, ~~and~~ (x) project name, and (xi) MW capacity of any planned co-located load,

excluding Station Power load. Except in the case of an Affiliate, the list will not disclose the identity of the Interconnection Customer until the Interconnection Customer executes a GIA or requests that the applicable Participating TO(s) and the CAISO file an unexecuted GIA with FERC. The CAISO shall post on the CAISO Website an advance notice whenever a Scoping Meeting will be held with an Affiliate of a Participating TO.

* * * * *

6.7.2.9 Co-located Load Modifications

The Interconnection Customer may request, and the CAISO and Participating TO will evaluate, the removal of co-located load from an Interconnection Request if the removal does not increase the requested Interconnection Service level. The CAISO and Participating TO must evaluate such modifications prior to deeming them a Material Modification, but only if the Interconnection Customer submits them prior to the return of the executed Interconnection Facilities Study Agreement by the Interconnection Customer to the CAISO. Interconnection Customers seeking to add co-located load to an Interconnection Request after the commencement of the Cluster Study may request to do so pursuant to Section 6.7.2.3, including as a request to downsize the Interconnection Service level pursuant to Section 6.7.2.7. For any co-located load addition or removal pursuant to the Participating TO tariff, if the CAISO and Participating TO determine that the change is a Material Modification or otherwise cannot be reflected in the Generating Facility's Interconnection Study results, the CAISO and Participating TO will note the change in the GIA, but without modifying the Interconnection Study results.

* * * * *

Attachment C – Final Proposal

Large Loads Tariff Amendment

California Independent System Operator Corporation

November 16, 2026



Large Load Enhancements

Draft Final Proposal

September 24, 2026

Prepared by:

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I. Executive Summary

Serving the epicenter of the data-driven economy, the California Independent System Operator (CAISO) offers this proposal to establish new procedures for fast and reliable interconnection of new large loads.

California faces a projected surge in electricity demand over the next decade, driven in part by new large loads such as data centers. The CAISO coordinates closely with local, state and federal regulatory authorities, utilities, and stakeholders to ensure timely access to power for new large loads. This coordination includes anticipating demand growth, exploring the complexities of co-located and flexible loads, ensuring equitable cost allocation, and considering new technical requirements to account for changing operational profiles. The actions described in this draft final proposal will ensure that the CAISO and its Participating Transmission Owners (PTOs) facilitate economic growth and innovation without compromising the overall reliability or affordability of the system.

This paper responds to the Federal Energy Regulatory Commission (FERC) Order to Show Cause on Large Loads and describes five key areas where CAISO leadership and engagement is necessary to enable innovation while protecting customers and ensuring safe and reliable service:

A. Developing procedures to improve coordination related to load interconnection applications, studies, technical standards, and operational requirements for accurate long-term planning and near-term reliability.
B. Upholding a workable framework for the PTOs to develop just and reasonable deposit, financing, and other cost allocation structures within their tariffs.
C. Establishing parallel information and application requirements for co-located arrangements in the CAISO's generator interconnection process to align with PTO load interconnection studies.
D. Creating a framework for new interconnection service to allow large loads to interconnect quickly to the transmission system while waiting for network upgrade completion.
E. Considering the need for a process to study generating facilities serving electrically proximate large loads.

Respecting the current assignment of responsibilities for the system, in which PTOs primarily manage the load interconnection process, this draft final proposal addresses topics that intersect with some of the CAISO's core functions; proactive transmission planning, generator interconnection, and operational reliability.



Plan proactively
Incorporate viable large load growth into CAISO transmission planning and resource interconnection process.

Study consistently
Establish consistent, transparent and timely study processes across PTOs to support efficient interconnection and system reliability.

Protect customers
Allocate costs and financial risks appropriately, improve cost transparency, and protect existing customers from unreasonable cost shifting.

Connect faster
Enable expedited Flexible Interim Load Interconnection (FILI), using enforceable flexibility until required network upgrades are complete.

Operate reliably
Establish the forecasting, visibility, coordination and operational capabilities necessary to reliably integrate large loads.

The CAISO continues to engage the PTOs in the development of this proposal and has made clear its expectations that the PTOs will timely develop consistent and conforming policies and procedures under their transmission tariffs, in service of an enhanced planning regime that provides visibility and transparency to all parties to uphold the CAISO's commitment to reliability. To give the PTOs direction for their filings, the CAISO proposes consistent minimum standards throughout this draft final proposal. In addition, the CAISO is closely coordinating with state and local regulatory authorities regarding this proposal and future large load enhancements going forward.

1. Introduction and Background

This Large Loads Enhancements draft final proposal constitutes a major step forward for the CAISO and Participating Transmission Owners (PTOs) charting a course to enable development and timely interconnection of new large loads, including data centers and other computing loads, onto the CAISO system. The concepts proposed rest on a foundation of highly integrated planning and coordination among the CAISO, PTOs, state energy agencies, and local regulatory authorities, and provide a framework upon which the PTOs will layer their own processes to serve new large loads while upholding and reinforcing the CAISO's commitment to reliability.

The CAISO opened this stakeholder initiative with the intent of clarifying roles and responsibilities in anticipation of accelerating large load inquiries and load interconnection requests coming to the PTOs. In 2025, the CAISO began regular engagement with the PTOs and formed a Large Load Technical Requirements Working Group (LLTRWG) to explore possible technical standards to ensure reliable operations as new large loads interconnect to the CAISO system. The CAISO's Issue Paper, posted in January 2026, described current roles, considerations, and processes for large loads, including transmission and resource planning, transmission service offerings, cost allocation and responsibility, technical requirements and standards, operational requirements, and related issues.[1] The CAISO has continued to monitor and engage in state and federal regulatory discussions regarding large loads and explored central issues and procedural steps that require additional transparency or new products. On June 15, 2026, the CAISO issued a Large Loads Technical Requirements Straw Proposal on behalf of the LLTRWG in order to stay ahead of any potential operational concerns that large loads may present.

On June 18, 2026, the Federal Energy Regulatory Commission (FERC or the Commission) issued six tailored orders to show cause under Section 206 of the Federal Power Act to each of the six regional grid operators under its jurisdiction, including the CAISO. The order to show cause (Order) directed at CAISO focuses on five central concerns, all of which are addressed in this draft final proposal. The CAISO met the first of the Commission's compliance requirements with submission of an Informational Report on Resource Sufficiency, describing recent attention to resource adequacy (RA), generation development, transmission expansion, and load and generator interconnection processes.[2]

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[1] *See* CAISO Large Loads Issue Paper at https://www.caiso.com/documents/issue-paper-large-load-consideration-jan-20-2026.pdf.

[2] *See* CAISO Informational Report - Large Loads and Co-located Loads at https://www.caiso.com/documents/jul-20-2026-informational-report-large-loads-and-co-located-loads-el26-71.pdf.

As directed by the Commission, the CAISO is coordinating closely with state energy agencies to complement their regulatory proceedings, as well as with the PTOs to ensure a fair and consistent application of requirements and procedures across the CAISO system. Such consistency is critical to enabling reliable and timely interconnection, energization, and operations of new large loads.

To anticipate and enable increasing load growth, the CAISO works with the state energy agencies, utilities, and stakeholders in its footprint. A 2022 Memorandum of Understanding (MOU) between the California Energy Commission (CEC), California Public Utilities Commission (CPUC), and the CAISO tightened the linkages between resource and transmission planning, interconnection, and procurement so California is equipped to meet its reliability needs and state energy policy objectives.[3] This framework has allowed the CAISO and the PTOs to meet the increasing demand forecasted for the state. As of January 2026, the CEC forecasts that data center load in the CAISO-managed grid will increase by 1.8 gigawatts (GW) by 2030 and 4.7 GW by 2035.[4] The CAISO also is aware that utilities are receiving an increasing number of large load interconnection and service applications, and is committed to staying ahead of the curve, with the timely serving of new energy demand reliably and affordably.

To date, California's integrated resource planning efforts have resulted in more than 37 GW of nameplate new generation and storage capacity coming online to serve CAISO load since 2020.[5] The close coordination between the CAISO, state agencies, and local regulatory authorities on demand forecasts and resource planning provides a pathway for proactive transmission planning that anticipates emerging large load growth by aligning that growth with commensurate resource and infrastructure development to serve new loads.

The current assignment of transmission responsibilities for the system under the CAISO's operating control gives lead responsibilities for resource (generator and storage) interconnection and transmission expansion planning to the CAISO, while

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[3] *See* Memorandum of Understanding Between the California Public Utilities Commission and the California Energy Commission and the California Independent System Operator Regarding Transmission and Resource Planning and Implementation at https://www.caiso.com/Documents/ISO-CEC-and-CPUC-Memorandum-of-Understanding-Dec-2022.pdf.

[4] California Energy Demand 2025 Hourly Forecast – CAISO – Planning Scenario: https://efiling.energy.ca.gov/GetDocument.aspx?tn=268127&DocumentContentId=105135.

[5] *See* CPUC Resource Tracking Data Reports at https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/summer-2021-reliability/tracking-energy-development/cpuc-resource-tracking-data-reports.

utilities, specifically the PTOs, hold the lead role for load connections.[6] These relationships are set out in the FERC-approved tariffs of the CAISO and the PTOs and the CAISO transmission control agreement. To date, most of the load interconnections have been distribution-system connections informed by the utilities' distribution system requirements, with third-party customer connections managed with the utilities. This structure has efficiently and effectively enabled the utilities to manage both their PTO responsibilities for transmission connections regulated by FERC and their state-jurisdictional responsibilities for rates and charges that apply to end-use customers.

However, the CAISO and the PTOs recognize that there is an increase in load interconnection requests for transmission-system connections that raise questions about the roles and responsibilities of the CAISO and the PTOs. FERC's Order raises many of these questions. This draft final proposal addresses the issues the Commission raises in the Order that directly pertain to the CAISO's responsibilities to anticipate and plan for new additions to the CAISO system, provide transmission service, and maintain reliable operations of the grid. This document highlights several issues that will require significant coordination among the PTOs to develop consistent tariff policies and procedures that conform to the framework the CAISO proposes. The draft final proposal also continues to respect the distinct roles of the CAISO versus the various types of PTOs, while complying with the requirements the Commission describes in its Order.

The CAISO is also conducting other stakeholder initiatives that will provide additional benefits to reliability, market efficiency, and affordability, as described below. These stakeholder initiatives include the CAISO's ongoing work on Resource Adequacy, Demand and Distributed Energy Market Integration (DDEMI); and Interconnection Process Enhancements

The CAISO also engages in state-level coordination efforts regarding large loads as California agencies are implementing state law related to data centers and examining the implications of large loads in resource planning and procurement, interconnection,

[6] At times in this draft final proposal, the CAISO will distinguish between utility responsibilities as participating transmission owner (PTO), utility distribution company (UDC), or load-serving entity, as all carry different responsibilities depending on the type of load and regulatory topic in question. Utility distribution company refers to an entity that owns a distribution system for the delivery of energy to and from the CAISO-controlled grid, and that provides regulated retail electric service to Eligible Customers, as well as regulated procurement service to those end-use customers who are not yet eligible for direct access, or who choose not to arrange services through another retailer. PTO refers to a party to the Transmission Control Agreement who has placed its transmission assets and Entitlements under the CAISO's Operational Control in accordance with the Transmission Control Agreement. Load-serving entities are responsible for serving retail electricity customers and, in California, this include investor-owned utilities, community choice aggregators, publicly owned utilities, and electric service providers.

retail rate design, and energization,[7] with open proceedings at the CPUC and in certain dockets at the CEC. The CAISO also recognizes that California recently enacted several pieces of legislation related to data centers, which could have implications for large loads connecting to the distribution system. The CAISO will continue to work with the state energy agencies and PTOs to address the new statutory requirements.

As described throughout this draft final proposal and in the CAISO's 30-day Informational Report[8] on resource adequacy to serve large loads, current State planning forecasts and procurement trajectories indicate that California can accommodate the large load growth reflected in the adopted demand forecast, provided planned resource additions, procurement and transmission development continue to materialize. As a risk mitigation tool for capacity constraints, however, the CAISO is exploring the concept through which local regulatory authorities (LRAs), load-serving entities (LSEs), Utility Distribution Company (UDC), a metered sub-system (MSS), and PTO would work with the CAISO to develop a framework for curtailing large loads under tight grid conditions, before a reliability event. The CAISO recognizes the jurisdictional complexities of this approach and plans to work collaboratively with the LRAs, including the CPUC, and LSEs to identify the necessary requirements to enable such a framework. In exploring a potential framework, the CAISO would continue its collaboration with the CEC and the CPUC to understand any implications on the integrated planning framework. Discussions around this curtailment approach are separate and distinct from the CAISO's response to the Order; as such, the CAISO will continue to explore it in a future policy initiative.

The CAISO also notes that the North American Electric Reliability Corporation (NERC) is actively advancing industry-wide efforts to address reliability impacts of large loads, particularly large computational loads, such as data centers. In May 2026, NERC issued a Level 3 Essential Actions Alert addressing large load modeling and data, system studies, commissioning, ride-through performance, and monitoring. In addition, under NERC Project 2026-02 – Computational Loads, on August 19, 2026, NERC posted new and revised Reliability Standards for formal industry comment and ballot. These standards, together with related revisions to NERC registration criteria and other ongoing NERC initiatives, are intended to establish a longer-term reliability framework for computational load. The CAISO is actively participating in these efforts and coordinating its large load technical requirements with the evolving NERC framework.[9]

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7 The CPUC refers to load interconnection as "energization."

8 *See* Informational Report - Large Loads and Co-located Loads at https://www.caiso.com/documents/jul-20-2026-informational-report-large-loads-and-co-located-loads-el26-71.pdf.

9 *See* Large Load Technical Requirements - Straw Proposal at https://stakeholdercenter.caiso.com/InitiativeDocuments/Large-Load-Technical-Requirements-Straw-Proposal-Jun-15-2026.pdf.

The CAISO will seek to implement the proposed changes expeditiously upon the Commission's approval. As the Order requires, the CAISO will describe how it will timely implement the measures described below while avoiding disruption of existing commercial arrangements. In its filing, the CAISO will clearly identify a reasonable effective date to apply to new large load interconnection applications and accommodate existing commercial arrangements.

The CAISO has an essential role in planning for and maintaining reliable operations of the CAISO-controlled grid and in facilitating consistent approaches to large load interconnections among the PTOs. Considering the urgency of onboarding new large loads and the required timeline to submit a filing to FERC under Federal Power Act Section 205, the CAISO issues this draft final proposal for stakeholder consideration.

Stakeholder Process and Feedback on the Large Loads Straw Proposal

The CAISO received comments on the straw proposal from ACP-California (ACP-California), AltaGas, Antora Energy (Antora), Bay Area Municipal Transmission Group (BAMx), California Community Choice Association (CalCCA), the California Department of Water Resources – State Water Project (CDWR), the California Public Utilities Commission (CPUC), the Public Advocates Office of the CPUC (Cal Advocates), Constellation, Google, GridLiance West (GridLiance), IGNIS Energy USA (IGNIS), Independent Energy Producers Association (IEPA), KritiGrid, Lotus Infrastructure Partners (Lotus), LS Power Grid California (LSPGC) and DesertLink, Microsoft, NextEra Energy Resources (NextEra), Northern California Power Agency (NCPA), Pacific Gas and Electric Company (PG&E), Pattern Energy (Pattern), San Diego Gas and Electric (SDG&E), Solar Energy Industries Association (SEIA), Southern California Edison (SCE), State Water Contractors (SWC), Tesla, Trimark Associates (Trimark), Valley Electric Association (VEA), Viridon California (Viridon), and Voltus. These stakeholder comments informed the draft final proposal and are addressed as appropriate and by topic in the subsequent sections of the draft final proposal.

Stakeholder comments centered on two topics. First, most stakeholders requested to see the PTO proposals before each PTO files tariff revisions at FERC. Second, stakeholders requested to see more implementation details from both the CAISO and PTOs. The CAISO recognizes that its draft final proposal relies on complementary tariff updates from the PTOs. Over the past several months, the CAISO has communicated its understanding of roles and responsibilities clearly with the PTOs, with general consensus on expectations. Throughout this proposal, the CAISO identifies areas that it views as PTO-led and reinforces the previously communicated expectations to stakeholders to ensure alignment. To that end, the CAISO expects to continue to

coordinate closely with the PTOs in the remaining weeks leading up to the compliance filing. In addition, the CAISO expects the PTOs to avail themselves to stakeholder inquiries regarding their efforts to update tariffs, pursuant to the Order.

The CAISO also appreciates the general stakeholder consensus that there will need to be ongoing coordination work on the implementation details. Some of those areas are addressed below, and the CAISO will continue engaging stakeholders on these matters going forward. Stakeholder feedback on this draft final proposal will help to inform the CAISO's filing at FERC in response to the Order.

A. Transmission Service to Eligible Customers on Behalf of Large Loads

The Commission directed the CAISO and the PTOs to either show cause as to why their FERC-jurisdictional tariffs remain just and reasonable and not unduly discriminatory or preferential without provisions addressing the five categories set out in the Order, or to explain what changes to their tariffs would remedy the identified concerns. The first category included provisions addressing the application process, study procedures, and ongoing operational requirements that apply to "Eligible Customers" seeking transmission service on behalf of large loads.[10]

The CAISO agrees with the Commission that additional clarity and information requirements are necessary within the CAISO tariff, especially if interim or non-firm service is being considered to facilitate "speed-to-power," or accelerated large load interconnections. Further, the CAISO encourages consistency among the PTOs in key areas related to large load interconnection application, study, and operations.

In addition, the CAISO proposes a series of operational requirements, which it will continue to develop in coordination with the PTOs and the LLTRWG, and in parallel with the NERC's efforts to develop technical standards for the reliable operation of large loads.

While recognizing some changes to the CAISO tariff are needed to address the Commission's concerns with regard to the first category in the Order, the CAISO does not propose significant changes to the roles and responsibilities associated with large load interconnection applications or studies. The current framework of shared responsibilities among the CAISO and the PTOs remains an efficient and effective mechanism to achieve the aims FERC outlines in the Order. The PTOs remain largely

[10] Order to Show Cause at P 3.

responsible for processing applications and studying new large loads, while the CAISO remains responsible for reviewing those studies and ensuring alignment with transmission planning activities. The CAISO notes the importance of this clarity of roles and consistency as it relates to large load interconnections and operations on the system and believes the proposed tariff enhancements below complement the load and resource planning process described in the December 2022 MOU between the CAISO, CPUC, and CEC. The CAISO believes that this framework, with some clarification and new information and operational requirements, will address the concerns the Commission described in the first category in the Order.

Background and Stakeholder Comment

The CAISO agreed with the Order's direction to provide additional clarity in its tariff for its part of providing service to large loads, while expecting the PTOs to collectively develop their own consistent set of Tariff reforms to clarify their load interconnection processes and communications, and to align their proposals with the CAISO's processes.

Load interconnection process and responsibilities across PTOs

ACP-California recommended the CAISO take a more active role in guiding the development and alignment of application and study process across all PTO-types. NextEra suggested a guiding principle that implementation of the large load interconnection framework will not adversely affect the timelines, resources, or effectiveness of the CAISO's generator interconnection or transmission activities. The CAISO engaged in frequent discussions with all PTO types on this topic prior to the Order and will continue to encourage alignment of the application and study processes across the PTOs. It should be noted here that the PTOs currently manage the majority of activities associated with load interconnection and the Commission has not indicated a need for the CAISO to take over the load interconnection process from the PTOs, and the CAISO does not propose to do so.

Microsoft encouraged the CAISO to prioritize four reforms in this initiative: study timelines, PTO coordination, energization timeline certainty, and cost transparency. Microsoft suggested that the CAISO, PTOs, and applicable state-jurisdictional processes should clearly define and coordinate their respective responsibilities so customers can receive greater certainty regarding available service and energization dates. The CAISO appreciates this feedback and is working to address all four reforms in partnership with the PTOs.

GridLiance, IEPA, and LSPGC and DesertLink sought further guidance on how the proposed large load interconnection framework would apply to non-load-serving PTOs, noting that the absence of detail creates uncertainty for both non-load serving PTOs and developers. GridLiance also cautioned against a critical gap that could create jurisdictional uncertainty and discourage large load interconnection in non-load-serving PTO territories, suggesting instead that the CAISO establish a consistent framework applicable to non-load-serving PTOs. PG&E suggested that the large load interconnection process be administered by each PTO based on the distribution service territory where the large load is located, acknowledging that implementation details may vary across PTO service territories and whether a PTO is also a UDC. From PG&E's perspective, non-load serving PTOs would not process retail large load interconnections and would continue to offer traditional wholesale load interconnection service to Eligible Customers pursuant to Section 10 of their respective transmission owner (TO) tariffs. The CAISO understands that some stakeholders would like the CAISO to resolve this dispute and appreciates the concern. However, the CAISO reiterates that the PTOs are much more familiar with the current load interconnection processes and responsibilities than the CAISO and are therefore in a better position to negotiate a process that clarifies roles and responsibilities. The CAISO encourages all PTOs, both load-serving PTOs and non-load-serving PTOs, to negotiate a fair and efficient process with clear roles and responsibilities for large load study and interconnection processes in their filings.

ACP-California suggested that the CAISO ensure that end-use customers are provided with the information and access they need to assess and select transmission interconnection options, including on points of interconnection on non-LSE PTO facilities. The CAISO expects the PTOs to describe how this information will be made accessible to end-use customers as part of their filings in response to the Order.

BAMx reiterated that municipal and other non-PTO utilities must have a meaningful role in the study and planning processes that determine the impact of these large loads on the reliability of the grid, and the allocation of costs related to the interconnection of these loads. BAMx recommended that CAISO concurrence should require affected system screening and coordination with non-PTOs before concurrence to protect non-PTO import capability and reliability. CDWR and NCPA expressed particular interest in any affected systems processes that are developed for load interconnections as well as more clarity on the co-located load interconnection process being developed by the PTOs in consultation with the CAISO. CDWR stated its concern about the potential impacts new computational loads could have, especially on CDWR's large pumping plants, which consist of synchronous large rotating mass. NCPA suggested that the CAISO require its PTOs to adopt a consistent, transparent, affected system study process that applies to all PTOs and is overseen by the CAISO. The CAISO notes that

affected system processes for load studies are and will continue to be addressed in the PTO's tariffs, and these roles are not expected to change.

The CAISO reiterates that it does not regulate the PTOs on matters of load interconnection. The Commission may opt to direct the CAISO to require the PTOs to adopt a consistent methodology for interconnecting loads, but the CAISO currently expects the PTOs to organize themselves to develop sufficiently consistent and complementary tariff provisions that align with the CAISO's processes. Specifically, the CAISO expects that each PTO's tariff will provide consistent processes that clarify the process for Eligible Customers seeking service, establish how non-load-serving PTOs coordinate with load-serving PTOs, and detail how affected system issues are coordinated with non-PTO utilities.

PG&E supported the CAISO's approach of preserving the existing allocation of interconnection and study responsibilities.

1. Definition of Large Load

FERC noted in the Order that the CAISO and PTO tariffs lack a definition of large load, as a new category of load.[11] The Commission directed the CAISO and PTOs to create an appropriate definition, including a load size and interconnection voltage threshold, based on the characteristics of CAISO's transmission system. The Commission suggested that a potentially reasonable definition would be "a new commercial or industrial customer, located at a single site behind one or more points of interconnection, and that has a peak load of 50 MW or greater, interconnects to the transmission system at a voltage level of greater than 69 kV, and is not part of a co-location arrangement."[12]

Background and Stakeholder Comment

In the straw proposal, the CAISO recommended the following definition for large load: "An End User located at a single site interconnecting to the CAISO Controlled Grid, and that has a peak load of 50 MW or greater," while indicating that the definition could evolve to account for future NERC standards.

[11] Order to Show Cause at P 58.

[12] *Id.* at P 57.

Several stakeholders, including the CPUC, IEPA, LSPGC, SDG&E, SEIA, SCE, and Viridon broadly supported the CAISO's proposed definition of large loads, and many stakeholders agreed that alignment with NERC standards is critical.

Types of large loads

Many stakeholders, including AltaGas and the CPUC, did not see a need for the CAISO to specify certain types of large loads (e.g. computational). CDWR recommended that the CAISO specifically state in the tariff that the definition applies only to new large load interconnections. The CAISO reiterates that the policies proposed in this initiative will begin to apply for new large loads only, and after resulting tariff revisions become approved and effective.

Direct connection to the CAISO-controlled grid

AltaGas, SDG&E, SCE, and others agreed that specifying connection to the CAISO-controlled grid is preferable to using a specific voltage level for defining large loads. The CPUC did not suggest a specific voltage level but notes that most large loads would be better served at higher transmission voltages. SDG&E and SCE agreed that the definition should be based on the connection to the CAISO-controlled grid rather than relying on a transmission voltage threshold, noting that some large loads may connect through distribution facilities that are not under CAISO operational control and may fall under state or local regulatory jurisdiction. The CAISO agrees with SDG&E and SCE and proposes to clarify that large loads to which the draft final proposal applies must be directly connected through a point of interconnection to the CAISO-controlled grid.

PG&E and BAMx argued that the phrase "interconnecting to the CAISO-controlled grid" was ambiguous as written because end users do not connect directly to CAISO-controlled facilities but rather are served by Eligible Customers via points of interconnection with the CAISO-controlled grid. To ensure uniform application, PG&E recommended a final proposed definition that includes all loads above the MW threshold that *affect* the CAISO transmission system, i.e., loads above the MW threshold served by an Eligible Customer via a point of interconnection on the CAISO-controlled grid. PG&E also recommended that the CAISO consider a 50 kV threshold at the end user's retail point of interconnection to the UDC as an additional measure to distinguish between customers that will have a high impact on the CAISO grid and those that will not. The CAISO believes that PG&E's proposed definition creates additional ambiguity because it seems to include intervening assets that may be first connected to the distribution system. It is also likely to lead to ongoing disputes about the meaning of "affecting" the CAISO transmission system. The CAISO recognizes the

clear jurisdictional boundary that the Commission initially suggested in the Order, that any large load must be directly connected to the transmission system. Therefore, the CAISO declines to adopt PG&E's proposal and proposes to specify that the point of interconnection must be to the CAISO-controlled grid whether that end user's facilities are directly connected to the transmission system or through radial/non-network interconnection facilities. The CAISO clarifies, however, that to the extent that distribution-connected or non-PTO connected loads create a need for network upgrades elsewhere on the system, those upgrades can be considered in the CAISO transmission planning process (TPP).

The CAISO understands that distribution-connected and non-PTO connected loads can impact the transmission system. The CAISO may address these instances in the future, including through the DDEMI Initiative. The PTOs, likewise, may address cost allocation impacts from such loads through both their FERC and CPUC tariffs. But, as discussed at length in the Order, FERC has jurisdiction over wholesale electricity sales and the transmission in interstate commerce. The Order is premised on FERC's duty to remedy the potential for undue discrimination in transmission access by regulating interconnections to the transmission system, not the distribution system, which is left to the states. The CAISO's large load definition is thus similarly limited by FERC's jurisdiction. The CAISO may not assert substantial rules on distribution-connected loads for the same reason that FERC has not asserted rules on them: distribution-connected retail customers are not jurisdictional to FERC under the Federal Power Act.

The CAISO nonetheless seeks to clarify the large load definition to recognize that there can be interconnection facilities between the actual load and the CAISO-controlled grid. The CAISO's draft tariff revisions likewise modify the definitions of Point of Interconnection and Interconnection Facilities to recognize the same.

Load-peak

Several stakeholders expressed support or comfort with the 50 MW load-peak threshold in the straw proposal. PG&E suggested reducing the load-peak threshold to 20 MW. BAMx, the CPUC, and Constellation suggested that the lack of apparent gaming is not sufficient reason to assume load projects will not need clear direction or enforcement to discourage them from breaking up projects to avoid large load treatment. Constellation suggested that the CAISO clarify how it will apply the 50 MW threshold to phased projects, expansions of existing facilities, and multiple loads that share a point of interconnection. BAMx recommended an aggregation rule for commonly-owned or electrically proximate loads, together with a look-back mechanism for staged additions. The CAISO recognizes that any arbitrary cutoff creates some incentive to avoid the load-peak threshold. This reality is inescapable regardless of where the cutoff lies.

However, the CAISO believes that the 50 MW threshold it proposed is based on the potential impact to the grid. Disaggregation and phasing cases may be addressed by determinations of whether the loads actually share a site, interconnection facilities, etc., and actually comprise a single load. Just as a single generating facility may consist of many generating units with their own meters and resource identifications, developers are unlikely to escape the large load threshold by trying to create the appearance of multiple loads. At the same time, the CAISO does not want to stifle developers and LSEs' flexibility to set up multiple meters and disaggregate facilities within a single large load campus. As such, the CAISO believes it can address these cases in the future on a case-by-case basis, as it does today with generator interconnections.

CalAdvocates noted that interconnecting to the CAISO-controlled grid would eliminate the need for a capacity threshold because customers interconnecting to the transmission system would be large enough to pose unique challenges to the interconnected system. The CAISO appreciates this point but views the capacity floor as a useful determinant and is aligned with what FERC identifies in the Order. As noted elsewhere, the CAISO does review both distribution- and transmission-interconnected loads of different sizes as a part of the TPP process.

LSPGC and Desert Grid suggested clarifying that the Eligible Customer is the entity directly connected to the CAISO-controlled grid and a qualifying end user has a peak load of at least 50 MW and is served by the Eligible Customer. The CAISO declines to include the term "Eligible Customer" in its definition of large loads to avoid unnecessary confusion. The CAISO believes that including Eligible Customer within the large load definition could introduce confusion, including because the CAISO tariff does not use Eligible Customer, and introducing it here could require other changes to the CAISO tariff, and because FERC Order No. 888 has a clear definition for Eligible Customer.

Proposal

The CAISO proposes to include a definition of "Large Load" in the CAISO tariff; however, the CAISO believes it may be premature to do so at this point, while NERC is developing similar, potentially overlapping, terms for computational loads. As such, the CAISO's proposed definition may shift in the coming months to avoid regulatory conflicts between its definition and NERC's. Aligning with future NERC standards will avoid creating dual or conflicting regulatory requirements for the same loads. Nevertheless, the CAISO describes below the principles it believes are helpful in defining large loads.

The CAISO proposes that a potential definition could be: "An End User located at a single site whose Point(s) of Interconnection is/are to the CAISO-Controlled Grid, and

that has a peak load of 50 MW or greater."[13] The CAISO likewise proposes to add large loads to its definitions of Interconnection Facilities and Point of Interconnection to clarify how all three terms work together.

Similar to generating facilities, the CAISO proposes to continue to adhere to FERC and California regulations on what constitutes a "site." The CAISO expects the large load definition will adequately apply to large loads comprised of distinct loads, even if they have separate retail meters, which will address concerns expressed regarding loads pursuing multiple connections to avoid pre-determined and specified MW threshold. Operationally, such loads would still have the same impact on the CAISO transmission system.

The CAISO believes that its proposed large load definition addresses the issues in the Order and coheres with FERC's jurisdiction to address them. The CAISO may develop other terms in the future to address other load types and locations. The Midcontinent Independent System Operator (MISO), for example, has proposed a 50 MW generic large load class as well as a 20 MW computational load class. The CAISO may follow this course in the future, depending on the Order proceeding and NERC's developments. At this time, however, the CAISO's intent is to comply with the Order without overburdening developers with what could become duplicative or onerous regulations.

2. Large Load Application Process

The Commission suggested that the CAISO and the PTOs lack clear and consistent provisions establishing the application process and study procedures that will be used when the CAISO and/or the PTOs evaluate the provision of transmission service to Eligible Customers on behalf of large loads, including an application process, application fee and readiness requirements, and information and data requirements.[14] The Order also suggested that the CAISO and PTO tariffs lack appropriate study provisions to recognize the unique operational characteristics of large loads that are willing and able to limit their energy withdrawals under certain conditions to lessen or avoid the need for network upgrades.[15]

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[13] Appendix A to the CAISO tariff defines an End User as "A consumer of electric power who consumes such power to satisfy a Load directly connected to the CAISO Controlled Grid, a Distribution System…" It defines the CAISO Controlled Grid as "The system of transmission lines and associated facilities of the Participating TOs that have been placed under the CAISO's Operational Control."

[14] Order to Show Cause at P 58.

[15] *Id.* at P 59.

In addition, the Commission noted that accurate models using Electromagnetic Transient (EMT) studies may help to ensure that transmission service needed on behalf of large loads can be provided without compromising reliability and suggests clarity and consistency in the evaluation of alternative transmission technologies (ATTs) as potential solutions to accommodate an Eligible Customer's request for transmission service on behalf of a large load.[16] To the extent that traditional network upgrades are selected over ATTs, the Commission recommended demonstration of why ATTs were not selected.[17]

Finally, the Commission directed the CAISO and the PTOs to explain whether their tariffs sufficiently address identification of Direct Assignment Facilities and Network Upgrades (as the Order defines) necessary to reliably provide transmission service to Eligible Customers on behalf of large loads; include provisions for a 60-90-day timeline to study the unique operational characteristics of large loads; and include a study deadline to assess large loads.[18]

Background and Stakeholder Comment

The CAISO proposed enhancements to data sharing and ongoing coordination with PTOs who lead the load interconnection application and study process, while noting that the PTOs should develop consistent load application processes to support efficiency, visibility, and planning.

Study process for co-location agreements with exporting generators

AltaGas suggested clarification that the generation component of new large load generation/storage combinations planning to discharge energy into the grid would interconnect under the CAISO tariff, including cluster-study processes and listings in the queue, and requested clarity on how the relatively recent generator interconnection request intake and study rules would apply to these combinations.

AltaGas further noted that the application process is not clear if an existing resource adding a large load to its site might still discharge energy into the grid (see discussion below about RA status retention for the resource). This would seem similar to the above situation where a new large load-resource combination would inject energy into the grid, but that new combination type must apply under CAISO tariffs. The CAISO confirms that existing generators planning to add large loads to their current interconnection

16 *Id.*
17 *Id.* at P 61.
18 *Id*. at P 62.

arrangements would interconnect under PTO Tariffs, even if they plan to continue to discharge energy into the grid. The CAISO encourages these generators to come to the CAISO to update their Generator Interconnection Agreement (GIA), master file, or seek a post-COD modification if necessary.

Study transparency

BAMx and the CPUC encouraged the CAISO to clearly require standardized, transparent study framework with common base cases, assumptions, and criteria across wholesale interconnection studies and PTO retail load-cluster studies, with the CPUC noting that the straw proposal lacked any enforcement details pertaining to application process, study requirements, and timelines. BAMx notes that (i) FERC has placed the TO Tariffs directly at issue in this §206 proceeding and may itself direct standardized study provisions. BAMx also points out that the CAISO independently possesses authority under the Transmission Control Agreement and its own tariff to condition concurrence, transmission planning process treatment, and transmission access charge (TAC) cost recovery on studies performed using common base cases, assumptions, and criteria. The CAISO understands these concerns but notes that the PTOs will develop sufficiently similar rules to meet their requirements to comply with the Order. Large loads have interconnected and continue to interconnect in California without jeopardizing base cases, cost recovery, or reliability, and the CAISO believes its continuing work with the PTOs, regulators, and stakeholders will maintain this *status quo*.

Regarding EMT studies, the CPUC noted that the need for study data is being evaluated in other forums such as IEEE 1547.7 and NERC and suggests that the CAISO should take the lead role in preparing and maintaining the State's EMT data**.**

Proposal

The CAISO reiterates that the existing load interconnection process is conducted efficiently and effectively by the PTOs. For this reason, the CAISO proposes enhanced and ongoing coordination with the PTOs on the load and resource interconnection processes and expects the PTOs to align their load application processes with the CAISO's resource interconnection process to ensure the level of visibility necessary for the CAISO to plan for new large loads and maintain reliability once they are interconnected.

The CAISO suggests that the PTOs develop consistent application processes, study requirements, and agreements to ensure sufficient transparency in the load application

and study process. It is important for the PTOs to maintain some degree of consistency in their respective tariffs so the CAISO has a greater certainty around the consistency of data and operational details received by the PTOs in the load applications

The CAISO currently evaluates relevant alternative transmission technologies (ATTs) in its transmission planning process, which is the primary process through with the CAISO ensures service to new large load interconnection requests. The CAISO's evaluation routinely includes static synchronous compensators, static VAR compensators[19], advanced power flow control devices, transmission switching, synchronous condensers, voltage source converters, advanced conductors, and tower lifting. The CAISO understands that transmission providers must consider ATTs at all times. As a transmission provider, the CAISO must include in the generator interconnection cluster study report an explanation of the results of the evaluation of the enumerated ATTs for feasibility, cost, and time savings as an alternative to a traditional network upgrade.

Therefore, the CAISO supports and has broadly adopted the practice of duly considering and assigning ATTs to meet identified system needs, including when triggered by new loads interconnecting to the CAISO grid. The CAISO documents consideration of such technologies in its annual Transmission Plan. This has been the practice in CAISO for several years and was recently memorialized in the CAISO's tariff in compliance with FERC Order Nos. 2023 and 1920 (pending FERC approval).[20] To respond to the Order and the large load interconnection context specifically, the CAISO proposes to clarify these considerations through consistent language in the CAISO tariff, which the CAISO expects the PTOs will similarly include in their tariffs. Rather than providing standardized documentation of the detailed rationale each time a traditional transmission technology is approved over the use of ATTs, the CAISO proposes to continue to report annually on the approvals of ATTs within each transmission plan. The CAISO will continue to set out the alternatives that were considered in the selection of all preferred transmission solutions, whether ATTs or other more conventional solutions, to the reasonable depth necessary given the nature of the transmission need. This approach has worked well in the generator interconnection study process, enabling the consideration and use of ATTs and grid-enhancing technologies (GETs) without slowing down studies.

With regard to the Commission's ATTs-related modeling requirements, the CAISO coordinates annually with the transmission owners during the annual transmission planning process on the feasibility of ATTs, particularly evaluating the application of advanced conductors and flow control devices. The CAISO notes that Dynamic Line

[19] VAR refers to voltampere reactive, which is the unit used to measure reactive power in an AC electrical grid.
[20] *See, e.g.*, Section 6.2 of Appendix KK to the CAISO tariff.

Rating (DLR) refers to a transmission line rating varying based on local conditions, such as ambient air temperature, wind speed, cloud cover, solar heating, and precipitation, etc., rather than a static rating assumption. DLRs can provide additional capacity for a transmission line. In the CAISO's production cost simulation, many congestions were observed in the evening or in lower-temperature months. Such congestion can be potentially mitigated or reduced by adopting DLRs for the lines. In the CAISO's most recent planning cycle, DLRs were not modeled in production cost modeling cases, since it not only requires operational history data of weather conditions and line ratings, but also requires software and modeling enhancement to accommodate the data in production cost model. The CAISO is coordinating with the PTOs, the Western Electricity Coordinating Council (WECC), and the software vendor of GridView to explore the feasibility and possibility of implementing dynamic line rating in production cost models in future planning cycles.

As a general matter, the CAISO recognizes that the Order implicates various types of PTOs, including non-load-serving PTOs and approved project sponsors that could be impacted by large load interconnection requests but are not load-serving entities and do not have retail interconnection tariffs. The CAISO expects the PTOs to work together to clarify and develop complementary roles and responsibilities in their respective tariffs regarding requests for interconnections to non-load-serving PTO facilities.

3. Large Load Interconnection Study Procedures

The Commission highlighted a lack of clarity and consistency regarding the study of the provision of transmission service to Eligible Customers on behalf of large loads.[21] Further, the Commission noted that, while it does not seek to alter the allocation of rights and responsibilities between CAISO and PTO tariffs, the CAISO's and PTO's tariffs may not clearly specify which entity will be responsible for studying the provision of transmission service to Eligible Customers on behalf of large loads.[22] The Order suggested that additional study considerations may be necessary to address the unique operational and reliability challenges presented to the transmission system by providing transmission service to Eligible Customers on behalf of large loads.[23] The Commission noted that clear and consistent study processes may be necessary to fully capture the transmission system impacts of providing such transmission service, which could result in significant operational risks for the transmission system,[24] and suggested that tariff provisions may prevent disputes over a variety of issues, e.g. study timelines and delays, how the transmission service needed on behalf of the large load is studied, what

21 Order to Show Cause at P 51.
22 *Id*. at P 51.
23 *Id*. at P 52.
24 *Id*. at P 53.

types of network upgrades are considered, and how required network upgrades to provide the requested transmission service are determined.[25]

Finally, the Commission suggested that the CAISO and PTO tariffs fail to deter speculative or duplicative requests for transmission service by Eligible Customers on behalf of large loads.[26]

Background and Stakeholder Comment

In the straw proposal, the CAISO proposed coordination enhancements included a more robust data exchange process between PTOs and the CAISO. The CAISO noted that the PTOs should align their load interconnection studies with the CAISO's transmission planning process timelines, as feasible, and further proposed that it would clarify when and how it accounts for new load additions, including in the TPP concurrence process.

Stakeholders generally supported the comprehensive coordination the CAISO proposed with utilities, regulators, NERC, and WECC. Several expressed concerns or asked questions regarding the PTO ability to complete studies within 60-90 days.

Microsoft noted that following completion of the studies, customers should be provided with available options regarding firm, non-firm, or temporary non-firm service, project phasing, the use of GETs or ATTs, and any associated operational requirements, together with an estimate of project cost and schedule. Providing this information early in the process will give customers greater certainty regarding project feasibility, cost, and timing and will allow them to make informed investment and development decisions. The CAISO agrees with these objectives.

The CPUC recommended a high large load sensitivity in the annual CAISO TPP that aggregates active load-cluster requests (e.g., Group 1 and Group 2) above a threshold, so cumulative reliability and congestion effects are assessed before energization rather than merely reported. The CAISO notes that PTOs already study all active load interconnection requests within their interconnection study, which provides insight on the cumulative impact of the requests.

Cal Advocates suggested that the CAISO should refrain from using its concurrence process for approving transmission projects for large load interconnections, noting that

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25 *Id.* at P 54.

26 *Id.* at P 55.

the proposed clarifications to the concurrence process give PTOs an opportunity to inject speculative loads into transmission planning and could impair the state's aim to coordinate resource planning. Cal Advocates also noted that CAISO's concurrence process does not include any transparent evaluation of alternative transmission technologies, like GETs or energy storage. The CAISO's concurrence review does include GETs in potential alternative options for both local upgrades that move forward as load interconnection upgrades and area upgrades that are reviewed in the TPP.

More generally, the CAISO notes that the concurrence process provides important validation of the assumptions used in planning and confirms that proposed load interconnections and associated network upgrades do not create adverse reliability impacts to the regional system. The concurrence process also helps ensure that new infrastructure is appropriately sized, timed, and initiated based on credible and coordinated planning to meet forecasted load growth. The CAISO's planning framework identifies and mitigates area-wide impacts driven by significant new load growth. In parallel, the PTOs continue to advance the local and interconnection-driven network upgrades needed to reliably serve retail customers and safely integrate new large loads under the PTOs' obligation to serve them. This coordinated approach, whereby the CAISO addresses area-wide impacts through the Transmission Planning Process and PTOs advance local network reinforcements associated with load interconnections through the load interconnection process, is essential to facilitating the timely integration of new loads and minimizing reliance on operational workarounds.

Constellation suggested that the study framework should clearly explain the respective responsibilities of CAISO, the PTO, and the interconnection customer. It should also establish clear application requirements, a delineation of the studies to be conducted, study milestones and timelines, data-sharing procedures, and timelines for communicating material changes to study assumptions or required upgrades. Constellation also requested that customers receive access to the assumptions, methods, and results that support material upgrade or operating requirements, subject to appropriate confidentiality protections. The CAISO agrees that a clearly articulated study framework is necessary and intends to share all details around the process, as well as details on assumptions, methods, and results once its tariff revisions are filed. After filing these proposed tariff changes with the Commission, the CAISO proposes to convene regular working group meetings to communicate the PTO-CAISO load interconnection application and study framework to stakeholders, to begin working on implementation details, and on sharing assumptions, methods, and others, as feasible.

PG&E suggested that PTOs should retain the flexibility to conduct studies either sequentially or in clusters, and notes that additional details around study procedures and upgrade determinations methodologies be developed through PTO tariff revisions.

The CAISO looks forward to continued collaboration on these procedures to ensure alignment prior to filing proposed tariff changes with the Commission and, ultimately, as the CAISO and PTOs work through implementation details.

Long-term load forecasting

CalCCA noted that even if the primary responsibility for protecting against speculative load is best suited for the PTO, the CAISO still must ensure that it adopts tariff provisions that maximize the ability of the CAISO to validate new load additions and minimize the potential for approving transmission build out based upon inaccurate forecasts. The CAISO agrees and will continue to provide input into the load forecasting process with the CEC and in discussions with the PTOs.

Deterring speculative load interconnection requests for transmission service

The CPUC and Cal Advocates suggested that the straw proposal lacks any enforcement details pertaining to requirements to deter speculative load interconnection requests. Cal Advocates suggested that the CAISO refrain from studying and approving network upgrades for large loads until the large load completes readiness requirements. Cal Advocates noted that large load data center applications with signed agreements with the utility for electric service are included in the highest confidence group in the CEC's data center forecast. Cal Advocates stated that the CEC's current confidence groups may be insufficient to curb speculative load additions. The CAISO notes that the CEC is currently reviewing its data center forecast confidence level definitions in the 2026 Integrated Energy Policy Report process.

The CAISO reiterates that the PTOs have methods to evaluate the viability of specific load interconnection requests, and the CAISO expects PTOs to substantiate those methods in their proposed tariff filings. The CAISO will work with PTOs during the study process to further consider the viability of these requests in the transmission planning process and through concurrence.

Consideration of Advanced Transmission Technologies

The CPUC noted that the need for EMT study data is also being evaluated in other forums such as IEEE 1547.7 and NERC. State entities will need to formulate how these data will be collected and stored to ensure their consistent availability at a central, known location when required. The CPUC suggested that CAISO take a lead role in preparing and maintaining the state's EMT data. Voltus asked CAISO and PTOs to apply a technology-neutral standard for ATTs that would include contracted demand response and distributed energy resources (DR/DER) in the same way CAISO already evaluates hardware options: in the generator interconnection cluster study, in CAISO's

annual Transmission Plan reporting, and in the concurrence process. The CAISO incorporates demand response and distributed energy resources into the transmission planning process via the CEC's statewide demand forecasting efforts. Both types of resources with the appropriate attributes are considered as inputs to the transmission planning process to reduce the need for new transmission. The CAISO proposes clarifying how demand response and distributed energy resources are included in these processes in its tariff.

Proposal

As a minimum standard, the CAISO expects the PTOs to develop consistent study procedures to be completed within 60 to 90 days, as required by the Commission. In addition, the CAISO proposes a number of data requirements for the large load interconnection study procedures, described in Section A.4, to ensure the CAISO has the necessary information to account for such flexibility.

The CAISO agrees with the Commission's concerns in the Order that information in the large load interconnection study process regarding a large load's willingness to limit energy withdrawals under certain conditions is important for the CAISO's planning and operational purposes. The CAISO therefore proposes a framework for agreements under which large loads commit to limiting energy withdrawals under the flexible load interconnection service offerings described in Section D of this draft final proposal. The CAISO proposes to clarify in its tariff that the current process requires load interconnection requests to be submitted to the appropriate PTO pursuant to the PTO tariffs. The CAISO currently accounts for those load interconnection requests in the annual TPP and to some extent in the CAISO Resource Interconnection Standards (RIS). The CAISO proposes both clarifying and continuing this process in its tariff. In addition, the CAISO proposes enhanced data sharing and process alignment between the CAISO and the PTOs to further streamline the load interconnection request and study process.

As noted earlier in this draft final proposal, the CAISO does not propose changing the allocation of rights and responsibilities for studying large load interconnection requests from the framework in place today: the PTOs will continue to manage the bulk of the study responsibilities. This has been a highly efficient and effective process, to date, and the CAISO expects that it can continue to be so with the influx of large load interconnection requests. The CAISO encourages the PTOs to align their load interconnection study procedures among themselves and with the CAISO resource interconnection standards and TPP for enhanced clarity and consistency for customers. This PTO alignment will enable the CAISO and PTOs to fully capture the transmission system impacts of providing such transmission service by applying consistent study

parameters, and to minimize operational risks to the system through a common study framework.

The CAISO agrees with the Commission and proposes some tariff enhancements to ensure greater coordination and visibility between the CAISO and PTOs regarding the load interconnection study results. This will require continued coordination with the PTOs during the study process and will be particularly important for co-located loads and generation, discussed in Section C of this draft final proposal, as well as with the provision of flexible interim load interconnection (FILI) service, discussed further in Section D of this draft final proposal.

The CAISO acknowledges multiple possible configurations of large loads and co-located loads, each of which may necessitate unique information to fully mitigate operational or reliability concerns. These various configurations are described in Section C of this draft final proposal on co-located loads. Each will have different implications on the CAISO's generator interconnection study requirements. Co-located loads with exporting generation (existing or new), for example, will need parallel review by the CAISO and the relevant PTO.

Thus, the CAISO proposes a new requirement for co-located loads and generation to provide comprehensive information on both the load and generation in the CAISO's resource interconnection process, in addition to the PTO load interconnection application process. The CAISO proposes to establish procedures for the CAISO and PTOs to exchange and compare information to ensure the respective studies of the load and generator are consistent with the customer's requested mode of operation and type of service requested.

In light of the need for coordination between the CAISO's resource interconnection study process (in which the studies are conducted primarily by the PTOs) and load interconnection studies, the CAISO expects PTOs to propose enhanced alignment of their load interconnection request windows and study timelines with the CAISO processes. This is needed for all the information to be communicated back to the CAISO in a timely and consistent manner to inform the CAISO's broader transmission planning, resource interconnection, and deliverability allocation procedures. The CAISO notes that its resource interconnection timeline and transmission planning timelines are relatively bound in its tariff as required by FERC Order Nos. 2023, 1000, and 1920, and the MOU with the California state energy agencies. Therefore, the CAISO expects the PTOs will need to update their tariffs to align study processes with one another and in consideration of other related CAISO processes.

To ensure clarity on behalf of stakeholders, the CAISO encourages the PTOs to establish tariff revisions describing study timelines and procedures for the transmission service needed on behalf of large loads, types of network upgrades considered, and methods to determine required network upgrades to provide the requested transmission service.[27] The CAISO believes that a high degree of consistency would be useful across PTO tariffs to ensure timeline alignment, process efficiencies, and utility of data. In addition, the CAISO proposes to define in its tariff any instances when the CAISO would reject load interconnection study results or decline to consider or approve associated transmission solutions through the TPP; these conditions include instances when PTO study results indicate high operational risk or uncertainty, or would interfere with CAISO compliance with balancing authority, transmission operator, or reliability coordinator reliability standards.

The most effective way to ensure load associated with new large load interconnections is reflected in CAISO's TPP is to work with CEC to reflect this new load in CEC's demand forecast before CEC finalizes its forecast in the December timeframe each year. While the aim is for load forecasts incorporated into CAISO's TPP to include all anticipated load, there are instances where new load seeks to interconnect after development of the demand forecast and CPUC resource portfolios that the CAISO incorporates into its TPP. Currently, to address these instances, the PTOs may submit proposals for the CAISO's concurrence in the transmission plan. The concurrence for load interconnections only considers the transmission component of the load interconnection (*i.e.*, the network upgrades). The CAISO reviews and provides concurrence that the load interconnection and potential network upgrades to interconnect the load meet the transmission reliability requirements and are consistent with the long-term transmission plans in the area.

To address FERC's Order, the CAISO proposes to clarify within its tariff how the concurrence process addresses local network needs associated with large load interconnections. Specifically, the CAISO will conduct an engineering review for reliability and operations of PTO-proposed solutions.

- Proposed solutions with previously-approved network upgrades or upgrades identified in the load interconnection study with an expected in-service date later than the large load interconnection date, would not be eligible to receive firm service until the network upgrade is placed into service. These projects would be candidates for the FILI process.
- Local network upgrades would be identified by the PTO in the load interconnection study with cost responsibility determined pursuant to the applicable PTO tariff.

[27] *Id*. at P 54.

- Area network upgrades would need to be studied in the Transmission Planning Process. If the TPP identifies the need for the upgrade, the large load would be a candidate for FILI.

The CAISO also proposes to specify in its tariff a process for reviewing and documenting load interconnection requests through concurrence in the Transmission Planning Process to ensure reliability and consistency with long-term plans. The CAISO will review potential out-of-cycle transmission additions or upgrades to accommodate Large Loads on a monthly basis, and to fit within the 60-90 day process for PTO load interconnection studies.

In addition, consistent with existing planning processes, the CAISO proposes that it will continue to evaluate transmission system impacts of distribution-connected loads where those loads trigger a need for transmission network upgrades on the CAISO controlled grid. This proposal is consistent with current processes, under which the CAISO studies instances in which load interconnections trigger network upgrades their impacts on the system as part of the TPP via the concurrence process. The proposal affirms this approach, and maintains current roles and responsibilities, regardless of whether the load addition is transmission- or distribution-connected.

As discussed in Section A.2, (Large Load Application Process), the CAISO requests that the PTOs clarify in their tariffs the responsibilities of non-load serving PTOs' facilities receiving load interconnection applications from the LSE, and which party will lead the study process. If a PTO uses this concurrence process, the CAISO also expects the PTO to inform the CEC of its load interconnection so the CEC can account for this load in its demand forecast in subsequent forecast cycles.

Regarding FERC's concerns regarding speculative or duplicative large load interconnection requests, the CAISO agrees that its tariff does not deter such requests *per se* but suggests that the responsibility to do so is more appropriately held by the PTOs and therefore should be addressed through revisions to the PTOs' tariffs. For CAISO planning purposes, the CAISO notes that the CEC's Integrated Energy Policy Report (IEPR) long-term demand forecast includes information on applications for service submitted to utilities and applies adjustments to requested capacity based on utilization factors, confidence levels, and ramping assumptions.[9] Confidence levels are determined based on the status of project applications, and take into account the potential for duplicative requests, among other factors. If projects have signed agreements with the utility for electric service, they are included in the highest confidence group. The CEC demand forecast projects capacity and energy needs of new loads, and these new loads have been incorporated into the statewide planning processes for the past several years. The state's integrated resource planning and the

CAISO's TPP incorporate this information. This is one mechanism to guard against speculative or duplicative large load interconnection requests forming the basis of infrastructure planning in the CAISO. Additional mechanisms may be appropriate in the PTOs' tariffs.

4. Operational Requirements

The Commission preliminarily found in the Order that the CAISO's and PTOs' tariffs appear to be unjust and unreasonable because they lack provisions addressing ongoing operational requirements for Eligible Customers taking transmission service on behalf of large loads.[28] The Commission enumerated specific examples, including the lack of provisions governing hourly forecasts, telemetry data, equipment to enable the CAISO to monitor large loads; requiring the transmission customer to enable the CAISO to remotely disconnect large loads when necessary to maintain reliability; ramp rate or ride-through requirements; and control technologies and/or protection systems that may be necessary to limit Eligible Customer's withdrawals from the transmission system.[29]

Background and Stakeholder Comment

Several stakeholders supported clearly defined operational requirements for large loads where requirements are necessary to support grid operations, including Tesla, Microsoft, Constellation, and BAMx. CalCCA requested that the CAISO clearly articulate the underlying issue these information requirements are proposed to mitigate to allow for a more informed discussion of the appropriate data requirements and best methods for obtaining the data before adopting final requirements, noting that much of the proposed information will originate with the large load customer and may include commercially sensitive operational information. Tesla asked the CAISO to keep requirements performance-based and technology-neutral. LSPGC and DesertLink noted that non-load-serving PTOs may not have access to the information required to be shared with the CAISO in the straw proposal.

The CAISO appreciates stakeholder support for clearly defined operational requirements for large loads. The LLTRWG continues to evaluate and document the technical rationale, intended use, and relevant industry practices supporting each requirement. The LLTRWG will continue to refine the proposed requirements as appropriate, including ensuring that they are performance-based and technology-neutral. The CAISO will continue to seek opportunities for coordination and transparency, as appropriate, without sharing commercially sensitive information.

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28 Order to Show Cause at P 63.

29 *Id*.

Need for Additional Forecasting, Telemetry, and Operational Visibility Requirements

CDWR, Constellation, Microsoft, KiritiGrid, BAMx, PG&E, and Viridon generally supported CAISO's proposal to establish enhanced forecasting, telemetry, and operational data requirements for large loads, noting that these resources often exhibit characteristics that differ from traditional conforming load and may require additional data to support reliable operations. CDWR specifically supported efforts to address forecasting gaps associated with large loads, while BAMx emphasized that forecasting should reflect the operating characteristics of the service being provided.

The CAISO agrees that large loads require additional operational visibility beyond existing forecasting approaches. As large loads become a more significant component of system demand, the CAISO intends to establish requirements that provide visibility into expected load behavior, outages, operating limits, and operational flexibility while remaining focused on information necessary to support reliable grid operations.

Forecasting Requirements, Data Requirements, and Implementation

CDWR, SCE, Constellation, Trimark, and the CPUC requested additional details regarding forecasting requirements, telemetry specifications, reporting timelines, forecast accuracy expectations, data exchange protocols, and implementation processes. CDWR requested further details regarding forecast requirements and telemetry obligations. SCE sought additional discussion regarding forecast accuracy standards and implementation mechanics. Constellation requested greater clarity regarding integration of forecasts into day-ahead and real-time processes. Trimark requested more specificity regarding telemetry architecture and communications protocols. The CPUC requested additional clarity regarding reporting schedules and coordination processes. The CAISO acknowledges these requests and agrees that additional implementation detail will be necessary as the proposal progresses. While this initiative is intended to establish the operational requirements necessary to address the Commission's concerns, more detailed implementation requirements will be developed through business practice manuals and implementation working groups, including clarification regarding required information, submission timing, and reporting processes.

Roles and Responsibilities for Forecasting and Data Submission

Stakeholders expressed differing views regarding responsibility for providing large load forecasts, telemetry, outage information, and other operational data. Constellation, Viridon, and PG&E generally supported utilizing existing LSE and Scheduling

Coordinator structures for operational forecasting and market-related communications, while NCPA argued that these responsibilities should instead reside with PTOs or large load customers because PTOs generally maintain the contractual relationships necessary to obtain and validate the information. ACP-CA, Lotus, and SDG&E similarly raised concerns regarding responsibilities applicable to non-IOU entities and forecasting submissions.

The CAISO clarifies that the Scheduling Coordinator representing the LSE's service area for the large load will include the large load in its Bids, Scheduled Demand, and Meter Data, as applicable, for that area. Where permitted by the applicable Local Regulatory Authority, a large load may elect to participate directly through its own Scheduling Coordinator consistent with proposed tariff language.

Coordination Across PTOs, UDCs, LSEs, and Non-IOU Entities

ACP-California, CPUC, Microsoft, Viridon, PG&E, and VEA requested additional clarity regarding coordination and information-sharing responsibilities among PTOs, UDCs, LSEs, Scheduling Coordinators, and large load customers. ACP-California emphasized the need to ensure the requirements are workable for non-LSE PTOs, municipal utilities, and UDCs. The CPUC highlighted the need for transparency and coordination across multiple PTO territories to guard against speculative interconnection requests, Microsoft encouraged coordination and avoidance of duplicative obligations, Viridon and PG&E supported a formal information-sharing framework, and VEA requested flexibility for entities other than the LSE to schedule large load demand.

The CAISO agrees that successful implementation will require coordination among PTOs, UDCs, LSEs, Scheduling Coordinators, and large load customers. The CAISO intends to identify the operational information necessary to support reliable grid operations and establish clear requirements regarding the information that must be provided to the CAISO. The CAISO continues to expect that Scheduling Coordinators and LSEs will be responsible for coordinating the collection and submission of required operational forecasting information within existing market frameworks. The CAISO's objective is to establish clear and consistent information-sharing requirements while avoiding duplicative reporting obligations and ensuring that entities with operational responsibilities have access to the information needed to support reliable system operations.

Alignment Between Forecasting, Flexibility Products, and Planning Assumptions

BAMx, the CPUC, and KiritiGrid argued that forecasting requirements should appropriately reflect the flexibility, curtailment rights, and operating characteristics

associated with the service being provided and maintain consistency with planning and interconnection assumptions. BAMx asserted that forecasting should be aligned with the applicable service type and updated as service characteristics change, KiritiGrid supported forecasting requirements while emphasizing the importance of information regarding expected curtailment exposure, and the CPUC requested additional clarity regarding the relationship between upgrades, planning assumptions, and operational processes. The CAISO agrees that operational forecasting requirements should reflect the operating characteristics of the service being provided, including applicable operating limits, outages, derates, and available flexibility. The CAISO expects submitted schedules to accurately reflect the operational capabilities and constraints applicable to the load, including any flexibility associated with the applicable service type. This information is necessary to support reliable system operations and situational awareness. The CAISO intends to ensure that forecasted operational information accurately reflects expected operating conditions and material changes in load characteristics.

Implementation Timing and Market System Readiness

PG&E, CDWR, and SCE raised concerns regarding implementation timing, software modifications, business process changes, and the ability of existing systems to accommodate new forecasting requirements. PG&E noted that substantial software and process modifications may be required and expressed concerns regarding implementation by 2027, CDWR highlighted existing functionality gaps related to real-time scheduling adjustments, and SCE requested additional discussion regarding implementation pathways and operational impacts. The CAISO acknowledges these concerns and recognizes that some forecasting, telemetry, and operational visibility requirements may require systems development, process enhancements, and additional coordination among market participants. Consistent with stakeholder feedback, the CAISO will further clarify implementation details, including data requirements, submission mechanisms, and implementation timelines. This will be done through business practice manuals and implementation working groups prior to implementation.

General Support for Technical Requirements and Continued Technical Development

BAMx, Constellation, PG&E, SCE, SDG&E, VEA, and Tesla generally supported the technical requirements developed through the LLTRWG, including ride-through capabilities, post-fault active power recovery, ramp-rate limitations, telemetry, monitoring, modeling, commissioning requirements, and future technical development efforts. The CAISO believes the proposed requirements represent an important step toward ensuring the reliable interconnection and operation of large loads. As stated

above, the CAISO intends to continue evaluating implementation considerations as proposal development progresses and will seek practical approaches that achieve the intended reliability benefits while allowing sufficient time for required systems and process modifications. Consistent with stakeholder feedback, the CAISO will further clarify implementation details, including data requirements, submission mechanisms, and implementation timelines, through business practice manuals, and implementation working groups prior to implementation.

Need for Consistency Across PTOs, NERC Standards, Tariffs, and Planning Standards

The CPUC, Constellation, Microsoft, LSPGC and Desert Link, and SDG&E requested that technical requirements be implemented consistently across PTOs and aligned with evolving NERC reliability standards, CAISO tariffs, business practice manuals, and planning standards. The CPUC and Constellation emphasized alignment with NERC standards, Microsoft requested clear documentation and coordination across PTOs, LSPGC and Desert Link recommended incorporation of system-wide requirements into CAISO Planning Standards, and SDG&E requested clarification regarding where requirements would ultimately be codified. The CAISO agrees that consistency, transparency, and coordination are important objectives and intends to continue collaborating with industry reliability efforts while evaluating the appropriate mechanisms for implementation through tariff provisions, business practice manuals, planning processes, and other governing documents as appropriate.

Technical Telemetry, Phasor Measurement Unit (PMU), Communications, and Monitoring Specifications

Trimark, ACP-California, and Microsoft requested additional details regarding telemetry requirements, PMU deployment, monitoring obligations, communications architectures, data protocols, and performance standards. Trimark specifically requested technical specifications regarding telemetry data requirements, communications architecture, redundancy standards, and PMU requirements. ACP-California highlighted implementation and cost recovery considerations associated with monitoring and telemetry equipment, and Microsoft requested that requirements avoid duplicative telemetry and compliance obligations.

The CAISO acknowledges these requests and intends to continue working with PTOs and stakeholders to develop appropriate technical specifications and communications requirements while leveraging existing infrastructure where practical and avoiding unnecessary duplication of monitoring, reporting, or communications obligations.

Cost Allocation for Technical Requirements

BAMx and ACP-California commented that costs associated with technical compliance requirements, monitoring equipment, telemetry, and related infrastructure should generally be assigned to the large load customer creating the need for those requirements. BAMx specifically recommended allocating compliance costs to the large load, while ACP-California highlighted implementation and cost recovery considerations associated with monitoring and telemetry requirements. The CAISO acknowledges these comments and notes that the purpose of this part of the initiative is to establish the technical requirements necessary to support reliable operation of the system.

EMT Studies, Modeling Requirements, and Load Characterization

CDWR requested additional rigor related to EMT studies and sought assurance that changing load characteristics would continue to be accurately represented after interconnection. CDWR encouraged broader application of EMT studies and questioned how load characteristics would continue to be represented when software, hardware, customer composition, or operating practices evolve over time.

The CAISO agrees that accurate modeling and appropriate study methodologies are important to evaluating the reliability impacts of large loads. Consistent with the ongoing technical requirements effort, EMT studies will be performed where warranted based on system conditions, project characteristics, and engineering judgment. The CAISO also agrees that material changes in large load operating characteristics may have reliability implications and intends to maintain sufficient visibility into those characteristics to support ongoing reliability assessments and operational decision-making.

Additional Technical Requirements for Large Loads with FILI Service

Several stakeholders identified additional technical requirements that may be appropriate for FILI and FLIP service. Antora, BAMx, ACP-California and others emphasized the need for clearly defined and enforceable curtailment performance, including response times and operating limits, supported by appropriate telemetry, communications, controls, and verification. Antora also suggested capabilities such as automatic emergency curtailment and remote disconnection, while BAMx emphasized ensuring that the flexibility assumed in planning is consistent with actual operating performance and re-verified when the service arrangement changes. The CAISO appreciates stakeholder feedback regarding additional technical requirements for FILI service, and proposes additional details in the proposal below and in Section D. The CAISO agrees that any flexibility relied upon in planning and operations should be supported by appropriate performance, monitoring, communication, and control capabilities to ensure that curtailment can be implemented and verified when required.

The CAISO will continue to coordinate with the PTOs to determine the appropriate requirements and where those requirements should be established.

Remote Disconnection and Communications Requirements

Stakeholders generally supported maintaining reliable communication channels but expressed differing views regarding whether the CAISO should possess authority or capability to directly disconnect large loads. SDG&E, SCE, and Viridon argued that PTOs, UDCs, or retail service providers should continue to execute physical disconnection actions pursuant to CAISO instructions, citing customer relationships, jurisdictional considerations, and existing operational practices. The CPUC emphasized the importance of reliable communications and control capabilities during major disturbances, while PG&E noted that some large loads may require monitoring, control, and automated load reduction capabilities to support reliable operations. The CAISO agrees that reliable communication channels are important to maintaining system reliability and notes that existing reliability procedures already rely on the CAISO issuing operating instructions while PTOs execute required switching actions. The CAISO does not envision direct physical disconnection of large loads by CAISO personnel and expects any necessary load reduction or disconnection actions to continue to be implemented through established coordination procedures between the CAISO and the applicable PTO or other responsible entity.

Proposal

The CAISO agrees that the operational requirements the Commission identifies in the Order are necessary. The CAISO has been exploring these issues through discussions with PTO representatives in the LLTRWG, and through engagement with NERC. The LLTRWG was established by the CAISO and utilities interconnecting large loads to develop consistent technical requirements for the reliable interconnection and operation of large data center loads connected to the CAISO-controlled grid. The resulting Large Load Technical Requirements Straw Proposal, released on June 15, 2026, focuses on the technical characteristics needed to maintain system reliability as large data center loads, including AI-training data centers, continue to grow within the CAISO footprint.[30] The Large Loads Technical Requirements Straw Proposal complements broader stakeholder efforts addressing planning, transmission service, market, and operational considerations, and is intended to remain aligned with evolving NERC Reliability Standards and industry practices.

[30] *See* Large Load Technical Requirements - Straw Proposal at https://stakeholdercenter.caiso.com/InitiativeDocuments/Large-Load-Technical-Requirements-Straw-Proposal-Jun-15-2026.pdf

The Large Loads Technical Requirements Straw Proposal proposes technical requirements in the following areas, which the CAISO intends to continue to further develop through ongoing discussions with the LLTRWG and based on stakeholder comments in response to the Large Loads Technical Requirements Straw Proposal:

- Frequency ride-through
- Voltage ride-through
- Ramp-rate limitations
- Monitoring and telemetry
- Post-fault active power recovery
- Modeling data requirements
- Commissioning, including data verification and model validation

The Large Loads Technical Requirements Straw Proposal is intended to establish technical reliability requirements for the reliable interconnection and operation of large loads. Many of the proposed requirements address the technical operational concerns the Commission identifies in the Order. The Large Loads Technical Requirements Straw Proposal also identifies areas for which the LLTRWG is currently developing technical requirements that the Commission does not mention in the Order, including low- and high-frequency cycling, constant power operation, power quality, dynamic reactive power support, phase-angle jump ride-through, protection requirements, and other emerging technical considerations.

Based on discussions within the LLTRWG and coordination between the CAISO and participating PTOs, the CAISO proposes that the following requirements be addressed through the CAISO Tariff:

- Establish ramp-rate requirements;
- Establish frequency and voltage ride-through requirements;
- Require hourly forecasts, telemetry, and other operational data necessary to provide the CAISO with sufficient operational visibility;
- Utilize communication protocols for the CAISO to coordinate with the PTO to remotely disconnect large loads when necessary to maintain transmission system reliability, and;
- Establish requirements for maintaining communication channels between the CAISO and transmission customers serving large loads.

The CAISO proposes that the following requirements be addressed through the PTO tariffs:

- Require installation of phasor measurement units (PMUs) or similar high-speed monitoring equipment, with associated costs assigned to the transmission customer, and;

- Establish requirements for control technologies and/or protection systems, when necessary, to limit large load withdrawals from the transmission system.

The LLTRWG continues to refine the technical requirements based on stakeholder feedback, additional system studies, operating experience, and the ongoing development of NERC Reliability Standards for computational loads. As the work progresses, the CAISO and participating utilities will determine the appropriate implementation mechanisms. Depending on the nature of each requirement, implementation may occur via changes to the CAISO tariff, PTOs' tariffs, utility interconnection handbooks, Business Practices Manuals, and/or future NERC Reliability Standards, providing a coordinated framework for reliable integration of large loads within the CAISO-controlled grid. For example, depending on the results of large load interconnection studies, and the type of service provided to the large load interconnection customer (i.e. firm service or FILI), the CAISO and/or relevant PTO may require additional monitoring, control, or protective systems beyond those required by the CAISO to maintain reliability. Such systems may include automated schemes designed to reduce or disconnect portions of the large load during abnormal system conditions. The CAISO notes that it does not have direct control of switches, so the PTOs would need to make sure they have control at the right level. In other words, these requirements would be implemented at the PTO rather than at the CAISO level.

To ensure the ongoing visibility and operational control necessary to provide reliable transmission service, the CAISO also proposes tariff provisions enabling data exchanges with the PTOs and LSEs to ensure access to the following large load interconnection information. Static information about the large loads will come from the PTOs near the end of the interconnection process (similar to the new resource implementation process for generators). Day-ahead and real-time information will come from the LSE scheduling coordinator responsible for the large load's demand.[31]

For each large load, the CAISO proposes to require the following information from the PTOs during, or at the end of, the interconnection process:

- Information on whether the Eligible Customer is enrolled in a flexible interconnection program, described below in Section D of this draft final proposal;
- Load type;
- Variable or flat load designation;
- Expected hourly operating profile;

[31] The CAISO does *not* propose that the large load be required to have its own scheduling coordinator, nor that large loads be considered as their own LSEs. Rather, large load demand would be scheduled by their LSE similar to non-large load demand, and that same LSE would report any material data for the large load. If the large load participates in a CAISO demand response program, then it would a demand response provider and scheduling coordinator to represent it in the CAISO markets.

- Location of service;
- Point of delivery;
- Connected capacity;
- Minimum operating level;
- Maximum operating level;
- Utility program information;
- Any market participation status or expected participation in demand response programs;
- Maximum operating demand;
- Minimum operating demand;
- Curtailment capability;
- Expected hourly flexibility capability;
- Ramp-up capability;
- Ramp-down capability;
- Expected operating information sufficient to characterize expected load behavior; and
- For co-located generation that is *not* exporting or CAISO-participating, all generation characteristics

The PTO will be expected to inform the CAISO of any material changes after energization. Any co-located participating generators will still go through the CAISO interconnection and new resource implementation process.

Additionally, the CAISO proposes that the large load's load-serving entity's scheduling coordinator will provide the CAISO with the following data specific to each large load:

- Forecast submission requirements,[32] which will be incorporated into applicable balancing authority area demand forecasts and operational studies:
    - Hourly forecasts of expected load consumption for the Operating Day and a rolling 7-day period following the Operating Day
    - Day-Ahead Forecasts to be submitted no later than 0700 prevailing Pacific time on the day prior to the Operating Day
    - Forecasts at the individual large load identifier level
    - The schedules are expected to reflect the resource's anticipated operating capability, including planned outages, forced outages, derates, and applicable operating limits, including operating envelopes, to ensure schedules remain aligned with expected operating conditions.

[32] The CAISO tariff will establish conditions under which an interconnecting transmission operator must obtain a schedule/forecast from the Eligible Customer to provide to the CAISO.

- Real-time forecast updates: Updated forecasts whenever expected consumption of the large load materially deviates from previously submitted day-ahead forecasts, including:
    - Expected energization activities
    - Material changes in operations
    - Curtailments
    - Facility outages
    - Co-located generation impacts on the load forecast
    - Other known events affecting expected consumption
- Telemetry data:
    - Operational status
    - Real-time consumption
- Expected outages:
    - Planned outages
    - Forced outages
    - De-rates
    - Other operating conditions that materially affect expected consumption

As described above, the CAISO generally proposes to obtain large load data from the PTOs during the interconnection process and the load-serving entities representing the large load's demand in market timeframes. The CAISO does not currently propose requiring large loads to have their own scheduling coordinator or other direct relationship with the CAISO; however, this framework may need to change to remain consistent with ultimate NERC requirements for computational loads.

The CAISO also notes that it will require the PTO, load-serving entity (LSE), scheduling coordinators, or other appropriate parties to work with the CAISO to provide all available data on any reliability event. Similar to participating generator requirements, this requirement will ensure the CAISO, utilities, regulators, NERC, and WECC have sufficient data to conduct meaningful post-event analyses.

The CAISO also notes that, to the extent that software changes are necessary, the CAISO may require additional time beyond 2026 to select a vendor and develop, test, and implement the solution. However, the CAISO would seek to begin implementing the necessary software changes in 2027, with automation capabilities deployed on a phased basis and full automation targeted for completion by 2030.

5. Large Load Service Agreements

The Commission preliminarily found in the Order that the CAISO and PTO tariffs lack *pro forma* provisions in a transmission service agreement, or other applicable agreement, to memorialize the technical and operational terms the Order describes.[33]

Background and Stakeholder Comment

In the straw proposal, the CAISO stated its expectation that the PTOs would develop *pro forma* agreements to address large load operations and cost shifting prevention. PG&E supported PTO development of *pro forma* agreements to address large load operations and cost-shifting prevention, noting that for large loads seeking FILI service requests, PTOs could either develop a single study agreement with a flexible service addendum, or separate agreements for firm and flexible interconnection service. The CAISO supports either of these options as long as they are consistently developed among PTOs.

Proposal

The CAISO proposes that the PTOs develop a consistent *pro forma* agreements to memorialize the technical and operational terms the Order describes. At this time, it is not clear whether the CAISO should always be a signatory to a three-party agreement for large load interconnections. For example, the CAISO likely would not have any roles or responsibilities for the financing and construction of simple network upgrades needed for large loads receiving firm interconnection service. Such arrangements could be effectuated through a two-party interconnection agreement between the PTO and the large load developer, as performed today. On the other hand, for a large load requesting non-firm interconnection service, the PTO may need the CAISO to help memorialize and sign on to the operational procedures necessary to provide that service through new *pro forma* non-firm service agreements or utilizing the PTO's two-party interconnection agreement. For co-located large loads with exporting generation, the CAISO will need to be a party to a *pro forma* agreement that bridges the *pro forma* Large Generator Interconnection Agreement (LGIA) with the *pro forma* large load interconnection agreement or negotiate a non-conforming LGIA to account for certain details of the co-located large load interconnection on an individual basis. The developer also would be expected to execute a CAISO *pro forma* Participating

[33] Order to Show Cause at P 64.

Generator Agreement for the generator, but not a Participating Load Agreement for the large load.[34]

B. Cost Shifting Among Transmission Customers

1. Roles and Responsibilities

The Commission laid out key objectives regarding cost allocation of infrastructure needs[35] attributable to Eligible Customers taking transmission service on behalf of large loads: improved transparency regarding the assignment of network upgrades and their associated costs; and development of a *pro forma* cost recovery agreement between the CAISO, the relevant PTO, and the Eligible Customer taking transmission service on behalf of large loads. The Commission states that improved transparency will provide important information to state public utility commissions and other state regulators, enabling them to identify which transmission costs are caused by which transmission customers to appropriately sub-allocate costs at the retail level. According to the Commission, a *pro forma* cost recovery agreement would ensure that Eligible Customers bear the risk and are ultimately responsible for the costs incurred to provide transmission service, including the cost of network upgrades.

Background and Stakeholder Comment

In the straw proposal, CAISO proposed that PTO tariffs should set forth cost allocation rules and that PTOs should lead in the development of *pro forma* agreements regarding assignments of network costs. Further the CAISO emphasized that, coupled with enhanced PTO cost-allocation rules, the existing TAC can sufficiently prevent cost-shifting.

Pro forma agreements and standardized frameworks

IEPA, ACP-California, VEA, CPUC, and Microsoft recommended that there should be a consistent cost-allocation and recovery framework, with IEPA, ACP-California, VEA, and the CPUC stating that the CAISO should develop a framework for allocation of

[34] The Participating Load Agreement is for loads receiving wholesale service, which are not relevant to this initiative at this time.

[35] The FERC Order to Show Cause defined network upgrades as follows: The term network upgrades is used throughout this order to refer to modifications or additions to transmission-related facilities that are integrated with and support the overall transmission system. *See pro forma* OATT § 1.27 (Definitions – Network Upgrades). We note that CAISO's definition of Network Upgrades applies only to additions, modifications, and upgrades required to accommodate the interconnection of generating facilities. *See* CAISO Tariff, app. A (Definitions), Network Upgrades (0.0.0). (Footnote 13)

FERC-jurisdictional transmission costs that the CAISO and PTOs should then implement through their tariffs. The CPUC encouraged the CAISO to establish minimum requirements for determining cost allocation based on causation. Microsoft recommends that a framework should include safeguards against duplicative cost-recovery that disallows PTOs from recovering local upgrades that the large customer already paid for upfront. Viridon noted that not all PTOs have direct relationships with retail ratepayers and that the *pro forma* agreements should have consistent principles to protect customers against cost shifting. Viridon and PG&E agreed with the CAISO's proposal for PTOs to lead the *pro forma* agreement. SDG&E, CDWR, VEA, and the CPUC recommended that the CAISO be a party to *pro forma* cost-recovery agreements for large loads.

The CAISO agrees with stakeholders that there is a need for a consistent approach to cost-allocation and recovery but maintains that these provisions are most appropriately addressed in PTO tariffs. While the CAISO anticipates signing certain *pro forma* agreements involving large loads, as mentioned in the straw proposal, it does not expect to sign every agreement between a PTO and a large load developer. At this time, the CAISO does not intend to establish a cost-recovery and allocation framework for the PTOs to use in their tariffs, though it recognizes that one may become necessary if inconsistencies emerge among PTO tariff provisions. The CAISO additionally recognizes the ultimate need to bring non-FERC jurisdictional PTOs into alignment with the cost allocation framework of the FERC-jurisdictional PTOs. The CAISO proposes to address this framework in a future CAISO stakeholder initiative and filing, once greater certainty exists around the mechanisms the PTOs propose to adopt to prevent cost-shifting under this Order.

Assignment of costs

Stakeholders provided different recommendations for how or whether to assign costs associated with network upgrade costs attributed to large loads. BAMx and NCPA recommended that single large load customers driving network upgrades should be required to pay for those upgrades, and Constellation also supported assigning infrastructure costs to customers whose infrastructure requests cause those costs. CDWR generally supported the CAISO's efforts to ensure new large loads bear equitable responsibility for costs incurred for interconnection and use of the transmission system. Cal Advocates recommended that the CAISO update the straw proposal to reflect that PTOs have not established interconnection terms requiring large loads to pay for network upgrade costs that address cost shifting. The CPUC was concerned that the straw proposal did not lay out upstream mechanisms to allocate costs to large load customers and recommended that the CAISO and PTOs take measures to ensure that cost estimates are accurate and that credit and minimum

contributions align with costs to be incurred serving large loads. Google and Microsoft similarly advocated that customers pay for local upgrades directly driven by large loads, with network upgrades that provide broad system benefits recovered through the TAC. IEPA suggested that the CAISO update the proposal to outline how a large load generator paying for the entirety of a network upgrade that is made available to other users will be reimbursed. Related to the amount that PTOs include into their total revenue requirement, and therefore what's recovered through the TAC, SDG&E and PG&E supported the CAISO's proposal. SCE was still evaluating whether it believes that the CAISO can comply with FERC's Order without modifying its tariff to prevent the socialization of high-voltage transmission network upgrades associated with large loads. NCPA and CDWR encouraged the CAISO to exercise tariff authority to oversee what costs and network upgrades are included in the TAC and in wheeling charges. BAMx recommended the CAISO re-start its 2018 TAC Structure Enhancements.

The CAISO appreciates and shares stakeholder concerns around cost-shifting and offers an explanation below of how such cost-shifts can be avoided and that this can be accomplished most effectively without fundamental changes to the CAISO TAC.

The CAISO emphasizes that the PTOs are responsible for establishing tariffs for their customers that do not result in cost-shifting between customers of the PTO, with a particular focus on network costs.

The CAISO also understands that concerns may remain in instances where one PTO with significantly more large load interconnections may incur network costs that drive up the regional high voltage TAC across the CAISO footprint, and describes a solution below, which is available to the CAISO and PTOs under the current structure and CAISO processes.

Stakeholders also provided input on network costs incurred for load that does not materialize as expected, though there was directional alignment among BAMx, SDG&E, SWC, LS Power and DesertLink, Cal Advocates, and PG&E that there should be some mechanisms in place to protect ratepayers in these instances. Cal Advocates and BAMx advocated a longer payback period to recover upfront costs until load materializes. SWC encouraged the CAISO, PTOs, and stakeholders to determine an appropriate payback period and BAMx proposed aligning reimbursement periods with the durability of the load. SDG&E advocated that the CAISO's FERC submission should state that an advanced funding requirement satisfies FERC's requirement that the Eligible Customer is responsible for network upgrades and, specifically, that large loads are responsible for the full costs of the network upgrades if the load doesn't materialize. LSPGC and DesertLink supported large load demand that does not materialize should bear risk and cost responsibility for network upgrades but should be eligible for reimbursement if the

load materializes, with PG&E providing a similar comment that non-large load customers can be protected from cost shifts with financial assurances and monetary protections. Lastly, Google recommended that the PTOs implement standardized ratepayer safeguards, such as minimum demand commitments. As stated earlier, the CAISO shares concerns about cost-shifting that could result from serving large loads, including in cases where a large load's demand does not materialize as expected, potentially exposing other customers to these costs. The CAISO expects that the PTO tariffs will sufficiently address this risk and expects alignment among the different PTO tariffs to account for this risk.

Proposal

The CAISO shares the objectives of the Order to prevent cost shifting among transmission customers and to ensure that large loads bear equitable risk and responsibility for costs incurred to interconnect, including the cost of network upgrades attributed to the large loads. The CAISO understands the importance of maintaining affordability while addressing large load integration.

The CAISO sees value in development of a *pro forma* cost recovery agreement and is working closely with the PTOs, which are leading development of this agreement, and cost allocation rules generally.[36] The CAISO believes it is prudent for cost allocation rules to be set forth in the PTO tariffs rather than the CAISO tariff. As discussed herein, the PTOs will continue to manage large load interconnections through their tariffs. Many of the PTOs also have a direct relationship with their retail ratepayers and the regulators of those ultimate rates, including the CPUC. Additionally, the PTOs have worked on these cost allocation issues and have more expertise in cost allocation than the CAISO, including on large loads. Finally, it is the PTOs that will construct and own the network upgrades if required for the large load interconnection. As such, the CAISO does not propose to issue a new "top-down" cost allocation solution through its own tariff. The CAISO believes that the PTOs may develop their own proposals to address any cost shifting, and that the current transmission revenue requirement and credit mechanisms in the TAC can accommodate those proposals. The CAISO proposes some metering and settlement changes in Section C of the tariff to account for co-located large loads and generation.

The CAISO recognizes the primary role of the PTOs in establishing just and reasonable provisions in their tariffs applicable to the large load customer taking transmission

[36] The cost recovery agreement could be part of the *pro forma* load interconnection agreement. They are discussed separately here because the Order to Show Cause discusses them as separate issues.

service on behalf of the end-use customer in order to prevent cost shifting among customers.

The concern is that, to the extent that one PTO (PTO-A) interconnects more large loads than another PTO (PTO-B), the network upgrade costs attributed to large loads in PTO-A may drive up PTO-A's annual transmission revenue requirement that is then summed with all other PTOs' annual revenue requirements to calculate the CAISO's regional high-voltage TAC that is applied to all UDCs and MSSs equally. This could become inequitable if the contributions or revenues recovered by the UDC or MSS from the end-use customer are not also used to reduce cost recovery from the entire CAISO customer base through the CAISO's TAC. However, the FERC System of Accounts and the requirements in the CAISO tariff already covers this issue.

To manage concerns around cost shifting caused by one PTO having a greater number of large load interconnections than other PTOs, the CAISO proposes the following: All PTOs should take into account the impact of construction contributions, revenues, or other cost offsets[37] associated with network upgrade costs directly attributed to large loads and paid for by the large load customer through the UDC or MSS in determining its transmission revenue requirement and its annual transmission revenue credits. This will ensure that only the revenue requirement net of those contributions or revenue offsets is used to determine the regional high-voltage TAC set by the CAISO and recovered across all loads and exports.

2. Data Transparency

In the Order, the Commission highlighted the need for "the provision of data on CAISO's website in a single location, and in an easily accessible format that is searchable and allows users to filter the data, on transmission service provided to Eligible Customers on behalf of large loads, for network upgrades evaluated in the local transmission planning process that are needed to accommodate transmission service to Eligible Customers on behalf of those large loads, and the costs for those network upgrades."[38]

Background and Stakeholder Comment

In the straw proposal, the CAISO proposed measures to provide additional data to increase transparency related to large loads. Google, NCPA, Viridon, SEIA, KritiGrid, PG&E, and BAMx supported the CAISO's proposal to publicly post additional data related to large loads and to memorialize the changes in the tariff. Those stakeholders,

[37] This includes financial security, minimum demand charges, exit fees, and similar mechanisms the Order mentions.
[38] Order to Show Cause at P 46.

along with CalCCA, requested that the CAISO post additional and more granular data. PG&E recognized that PTOs will have to provide data to the CAISO and expects that data transparency will be similar to the transparency in the generator interconnection process and supports the CAISO proposal to enhance transparency regarding large load interconnections. BAMx supported increased data transparency and requested that the CAISO regularly disclose data so that stakeholders could evaluate cost exposure, including which upgrades are customer-financed and which are recovered via the TAC, the aggregate cost and TAC-recovered portion of each project, and the cumulative interconnection impacts of large load interconnections across PTOs. KritiGrid recommended adding expected curtailment exposure as a fourth category to the proposed data framework. Google requested that the CAISO provide granular, up-to-date data, with the necessary masking needed to protect customer confidentiality. Viridon recommended that large load interconnection requests be visible in the TPP stakeholder process rather than just through the CEC's demand forecast and suggests that affected PTOs should receive notice of large load interconnection requests that could impact the non-load-serving PTO. CalCCA commented that the CAISO should ensure that its processes and procedures are transparent and provide data that are sufficiently granular. CalCCA further requested that the CAISO develop a process that allows CCAs and other stakeholders to access information on proposed load additions to allow external vetting. SDG&E notes that the Order does not require PTOs to maintain spreadsheet with large load additions, noting that it does not plan to develop or maintain a large load interconnection queue spreadsheet.

SCE, CalCCA, Microsoft, SWC, VEA, the CPUC, and Cal Advocates requested additional granularity about large load additions, including when they trigger transmission network upgrades. CalCCA and the CPUC both suggested that CAISO's proposal to use aggregate data is insufficient, with the former asserting that these data may not be adequate to protect against duplicative or speculative load and with the latter stating it does not meet the Order's transparency directive. SCE requested additional details on how the CAISO will determine when planned network upgrades are needed to accommodate large loads, identified by type of equipment and upgrade. VEA requested annual monitoring and public reporting of all large load-driving additions to PTOs' revenue requirements. Related to transmission upgrades, Microsoft suggested that the CAISO identify estimated costs, including the assumptions used to derive those costs, expected construction schedules, and required upgrades. Microsoft further suggested that the CAISO should distinguish project-specific upgrades from broader system upgrades and explain how changes in a project's scope and timing affect customer responsibility.

The CPUC opposed the use of concurrences as currently employed in the TPP, recommending that the CAISO clearly differentiate upgrades that serve specific

customers from those benefiting the greater grid. The CAISO reiterates a fundamental premise of transmission cost allocation: that customers pay transmission costs to the extent they benefit from the transmission. Although a network upgrade may be built as a result of a large load interconnection, the network upgrade itself may benefit a larger class of ratepayers. For high-voltage transmission network upgrades, for example, all CAISO ratepayers may benefit. On the other hand, a network upgrade that does not benefit certain ratepayers should not have its costs allocated to them. Low-voltage transmission network upgrades are only allocated to their PTO territory for this reason.[39] And there are always cases where the CAISO and PTOs may file non-conforming interconnection agreements to reflect that the interconnection customer alone benefits from an upgrade and thus receives all of its costs. Nothing in this initiative proposes to change these fundamental constructs.

SWC encouraged transparency among the CAISO, PTOs, data center developers, and market participants throughout the planning, interconnection, and cost-recovery process to safeguard against cost-shifting. Cal Advocates stated that the CAISO's current proposal does not provide enough transparency to determine if the network upgrade would be required if not for the large load and recommends that the CAISO establish a clear timeline for data releases that align with the TPP or a separate and dedicated process for large loads, the portion of each network upgrade the large load needs for service, and the cost estimate for each upgrade.

The CAISO recognizes stakeholder interest in access to granular data related to large loads additions and supports transparency. The CAISO also notes that forecasting and studying specific large load additions occurs through PTO processes and through the CEC's IEPR process. Lastly, as several stakeholders noted, there are data privacy requirements that limit what project-specific information any entity, including the CAISO, could share. Accordingly, the CAISO's proposed data transparency enhancements, coupled with those mentioned related to the TPP concurrence process, will address most stakeholders requested data additions without violating data privacy requirements, and satisfies FERC's direction on transparency and access. Further, the CAISO continues to encourage the load interconnecting PTOs to maintain sufficient transparency about large load applications to ensure that stakeholders can accurately assess these additions, as called for in the Order.

Proposal

[39] In other words, the transmission access charge is not a single charge, but many: the regional access charge for high-voltage network upgrades(200 kV+), and the many individual local access charges for low-voltage network upgrades.

The CAISO agrees that cost data should be transparent and can be provided on the CAISO website in a searchable format. This is important both to aid large load developers in making efficient siting decisions as well as to provide information critical for state regulators to ensure fair cost allocation at the retail level.

For large load developers, the CAISO notes that for the generator interconnection study process, the CAISO already provides each PTO's per unit cost guide for all network upgrade cost components.[40] These guides are updated and shared with stakeholders annually based on the latest industry cost estimates. The CAISO proposes to use the per unit cost guides or enhance them as needed to ensure large load developers can easily obtain cost data.

For state regulators and stakeholders, per the Commission's direction,[41] the CAISO also proposes to clarify in the TPP where network upgrades were needed to accommodate both general load growth and large load interconnection specifically. Large load growth has already been incorporated into the CEC, CPUC, and CAISO forecasting and planning processes, as detailed in the CAISO's Informational Report on Resource Sufficiency already submitted to the Commission.[42] The CAISO also proposes to publicly post:

1. Aggregate amounts of proposed large load additions in the CAISO operating area, including the aggregate amounts in each transmission pricing zone;
2. Planned network upgrades needed to accommodate Eligible Customers taking transmission service on behalf of large loads, identified by type of equipment and network upgrade (*e.g.*, new substation, reconductoring, a new high-voltage transmission line) for each transmission service request; and
3. Cost estimates for each planned network upgrade identified as needed for large loads, as described in (2).[43]

The CAISO proposes to memorialize these transparency requirements in its tariff. The CAISO also encourages the PTOs to memorialize tariff requirements to adopt large load queue spreadsheets as it does for wholesale generator interconnection customers. The

40 *See* CAISO Current cost guides at https://www.caiso.com/library/current-cost-guides.
41 Order to Show Cause at P 72.
42 *See* CAISO Informational Report - Large Loads and Co-located Loads at https://www.caiso.com/documents/jul-20-2026-informational-report-large-loads-and-co-located-loads-el26-71.pdf.
43 Order to Show Cause at P 75.

CAISO likewise proposes to include in its queue report whether the interconnection customer proposes to include a large load, and its capacity.[44]

C. Co-Location Arrangements and Load with Behind-the-Meter Generation

1. Terminology

For purposes of the Order, the Commission defined "co-located load" as "end-use customer load that is physically connected to the facilities of an existing or planned generating facility on the generator interconnection customer's side of the point of interconnection to the RTO/ISO's transmission system."[45] FERC further defined "Behind-the-Meter Generation" as "a generating facility that delivers energy to load without using the transmission system or any distribution facilities."[46] The Commission did not explicitly suggest that the CAISO or PTO tariffs were unjust and unreasonable because they lack definitions of co-located loads or behind-the-meter generation.

Background and Stakeholder Comment

In the straw proposal, the CAISO agreed with the Commission's definitions for co-located load or behind-the-meter generation and did not propose to explicitly define those in its tariff.

Some stakeholders disagreed with the CAISO not creating formal tariff definitions for co-located load or behind-the-meter generation or otherwise requested various clarifications. While PG&E agreed that there was a general understanding of the terms, it encouraged the CAISO to develop a definition that could capture the existing breadth of arrangements to avoid future ambiguities and noted that the Commission may disagree that there is not a need for a tariff definition. AltaGas disagreed with the CAISO that co-located load and behind-the-meter generation have plain meanings that did not require formal tariff definitions and stated there was no reason to restrict co-location to a single site if the large load and resource share the same interconnection facility. The CPUC asserted that some terms remained undefined or unclear, including date of service, time of installation, and operator of co-located generation. The CAISO recognizes that there is no stakeholder consensus on creating formal tariff definitions for co-located loads or behind-the-meter generation and notes that strictly defining those could exclude future large load co-location arrangements. Thus, at this time, the CAISO

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44 *See* CAISO Generator interconnection at https://www.caiso.com/generation-transmission/generation/generator-interconnection.

45 Order to Show Cause at P 88.

46 *Id*. at P 89.

does not find it prudent to formally define these in its tariff. To the extent that terms remain unclear and could confuse co-location arrangements, the CAISO will address those in the future.

ACP-California and SDG&E commented that they saw value in the CAISO including additional examples of how co-located load and generation arrangements would be treated through CAISO interconnection process and recommends that the CAISO provide more descriptions of arrangements that could work under the CAISO's tariff. As stated at the August 19th stakeholder workshop, the CAISO welcomes stakeholders with specific questions about co-location arrangements reaching out to the CAISO. The CAISO agrees that further clarity could be helpful, especially between the PTO and CAISO interaction and proposes that, for co-location arrangements, the CAISO tariff will apply to the generation, and the PTO tariff will apply to the load.

Several stakeholders recommended specific clarifications or asked for changes to parts of the proposals related to co-located agreements. ACP-California and NextEra requested continued coordination between CAISO and PTOs to ensure that load and generation interconnection work does not create redundant network upgrades. SEIA disagreed with the CAISO omitting a Bring Your Own Generation (BYOG) proposal and recommended that the CAISO either update that framing or adopt a BYOG framework modeled on Southwest Power Pool's (SPP) High Impact Large Load Generation Assessment (HILLGA). Google recommended that the CAISO adopt an established surplus and provisional interconnection mechanism to allow large loads to pair with co-located clean energy. The CAISO appreciates the recommendation and has updated the proposal to reflect details the CAISO can provide at this time. However, the CAISO reiterates that many of the fundamental details of the load interconnection application and study process, including the process for co-located loads, need to be articulated by the PTOs. The CAISO looks forward to working with PTOs and seeing these details in the coming weeks as all parties develop their filings for the Commission. Regarding the suggestion that the CAISO impose a BYOG requirement, the CAISO highlights California's unique planning structure and MOU with the state agencies and clarifies that it does not have procurement authority to consider such a requirement at this time. In addition, CAISO does not see evidence of a need for a BYOG requirement at this time given the state's forward resource, transmission, and procurement planning regime. Regarding the recommendation to establish provisional interconnection mechanism, the CAISO recognizes that there are multiple co-location arrangements, including potential arrangements that could be considered. The CAISO expects to continue conversations with the PTOs about this, as well as to consider the potential for these arrangements in a future stakeholder process.

Proposal

The CAISO generally agrees with both definitions proposed by the Commission; however, the CAISO would exclude from discussion station power load and the generation that exclusively serves station power load. The CAISO believes the Commission is focused on typical end-user loads and not loads facilitating wholesale power.[47] The CAISO does not believe it is necessary to create formal tariff definitions for co-located load or behind-the-meter generation and is not proposing to do so. Both terms already have plain meanings, and behind-the-meter is already used frequently throughout the CAISO tariff, including for different configurations based on whether the meter is a CAISO meter or a retail end-user meter. Thus, providing a definition may have inadvertent consequences to the extent it differs in any meaningful respect from the use of these terms currently. The CAISO may provide clarifications if needed in its business practice manuals.

2. Serving Co-Located Loads

The Commission stated in the Order that the CAISO's tariff does not contain provisions addressing with sufficient clarity and consistency the rates, terms, and conditions of service that apply to interconnection customers serving co-located load.[48] The Commission included, "the scope of the analyses CAISO performs as part of its existing study process to evaluate the impacts of co-location arrangements, which may need to account for any potential dynamic impacts of co-located load and any potential impacts of requests to modify an existing generating facility's interconnection service level to serve co-located load on transmission system reliability."[49] The Commission noted that in one of its recent orders on co-located load in the PJM Interconnection (PJM), it found that it was necessary to clarify that interconnection customers seeking to use new generating facilities to serve co-located load may: (1) request interconnection service at a level below the generating facility's maximum facility output; (2) use existing procedures to accelerate interconnection requests that satisfy certain tariff criteria; and (3) request provisional interconnection service and surplus interconnection service.[50] The Commission additionally noted that interconnection customers should have a

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47 The CAISO will continue to expect station power load to be metered separately from other loads and generation, consistent with local regulatory authority requirements.

48 Order to Show Cause at P 93. The Order to Show Cause has similar discussions of co-located loads in Section E, Interconnection Customers Serving Electrically Proximate Large Load and Co-Located Load; however, the CAISO includes all co-location-related proposals here for concision.

49 *Id*. at P 96.

50 *PJM Interconnection, L.L.C.*, 193 FERC ¶ 61,217 at PP 231-235 (2025) (PJM Co-Location Order). PJM's compliance filing proposing revisions in response to these directives was accepted in part on April 16, 2026. *PJM Interconnection, L.L.C.*, 195 FERC ¶ 61,030 (2026).

means of knowing the appropriate mechanism for setting forth the terms and conditions of co-location arrangements. The Commission also expressed concern that "without an Eligible Customer designated to take transmission service on behalf of a co-located load, there is no mechanism for CAISO to address situations in which a co-located load withdraws energy from the transmission system."[51]

Background and Stakeholder Comment

The CAISO initially proposed clarifying how co-located large loads and generation could interconnect and operate within the CAISO-controlled grid and included proposed data requirements and other process updates that could be required to accommodate these arrangements.

Large loads co-location framework

PG&E, IEPA, ACP-California, Pattern, SCE, and Google generally agreed with the CAISO's co-location framework, while requesting clarifications and modifications to the CAISO's proposal on co-located generation and load going through the CAISO's interconnection process. PG&E supported the CAISO's proposal and seeks clarification on the sequencing of the load and generation study components of co-location agreements, recommending that the two studies be conducted concurrently. PG&E further recommended that the CAISO require that new or existing large loads proposing to co-locate with new generation that may export to the grid to require a CAISO interconnection study under the CAISO's Resource Interconnection Standards. The CAISO agrees that there is a need to work closely with PTOs on timing and sequencing for studying load and generation and expects to work closely with these entities to align processes.

Study process for co-located arrangements

Some stakeholders either requested specific clarifications on CAISO's proposal to study co-located generation and load or otherwise requested changes to the proposal that load and generation stay together through the study process or otherwise re-enter the queue if there are changes. ACP-California and NextEra urged the CAISO to identify points in the generator interconnection process when a load could be removed from the study process without the associated generator losing its spot in the queue. PG&E sought clarification regarding the scope of the restriction on request modifications, including whether changes to a large load that increase the co-located facility's net megawatt exports to the CAISO-controlled grid would be prohibited or otherwise subject

[51] Order to Show Cause at P 96.

to the restriction. ACP-California further recommended that the CAISO look at ways to improve the study process and procedures for co-located generation and load and IEPA proposed that the CAISO initiate a dedicated initiative to study load and generation interconnection process to ensure maximum coordination with the PTOs. SCE requested that the CAISO clarify the study or restudy process if the owner of a co-located generator changes from non-exporting to exporting and states that the CAISO Tariff should not allow necessary short circuit studies to be bypassed even if the generator is not injecting into the CAISO controlled grid. The CAISO recognizes that large load co-location arrangements could change and proposes allowing Interconnection Customers to remove co-located loads from an interconnection request in the study process if that removal does not increase the request Interconnection Service level. The CAISO and PTO would evaluate whether the requested change is a Material Modification in determining whether it can accommodate the request as is or whether that project would have to re-enter the queue.

Large loads co-located with existing generation

Stakeholders requested clarifications or refinements to the CAISO proposal for generators currently interconnected to the CAISO-controlled grid that would serve large loads. Constellation supported CAISO's proposal to not apply a rigid framework to co-location arrangements and should clarify the pathway via tariff changes. Specifically, Constellation proposed that the CAISO update its tariff to clarify the circumstances under which a generator serving co-located load would lose, retain, or partially retain wholesale market participation rights; whether Retirement Scenario 3 applies where a generator continues providing wholesale services; how co-located load will be treated if the associated large load reduces consumption; whether interruptible or dispatchable co-located load may participate through a CAISO market construct or as demand response; how verified load flexibility will affect interconnection and market participation rights; whether existing amendment and modification processes can accommodate these arrangements; and the applicable study, operational, metering, telemetry, and verification requirements. IEPA, similarly, encouraged the CAISO to establish a tariff pathway for existing generation resources seeking to serve co-located load with continuing to provide wholesale energy and reliability service and to provide greater clarity on how existing interconnection, amendment, and modification processes may be used to accommodate large loads. The CPUC recommended that the state discourages pairing large loads with existing generation while AltaGas advocated that there is a benefit to the CAISO system by locating large loads at existing generation interconnection sites. AltaGas noted that the co-located configurations offer the opportunity to consider a different model: generators that primarily serve associated load but (through curtailment of the load or other means) may offer into the market and/or follow CAISO Dispatch Instructions when needed and thus may be permitted to

retain their net qualifying capacity list and resource adequacy (RA) status. Microsoft stated that the CAISO should preserve workable co-location options and avoid rules that foreclose future onsite generation or storage configurations. Trimark recommended that the CAISO provide additional clarification regarding how the New Resource Implementation (NRI) process, including which part of the NRI process applies to co-located large loads, whether a separate resource ID will be required, whether a separate points list will be created for the large load portion of a co-location application, and what telemetry points will be required for large loads.

The CAISO agrees that continued market participation of generators is one of several options but confirms that existing generators "leaving the grid" to serve associated loads must go through the CAISO resource retirement process so that the CAISO can prevent any adverse RA impacts. The CAISO would consider continued market participation and RA eligibility in that process. Related to market participation for existing generators co-locating with a new large load addition, the CAISO notes that resource adequacy requirements are addressed under existing rules and any future modifications would be considered through resource adequacy policy initiatives. Potential enhancements to large load market participation, including participation through demand response, price-responsive load, and other market mechanisms, are being explored through the DDEMI initiative. As noted in other parts of this draft final proposal, the CAISO further recognizes that there are implementation details that will likely require additional coordination among the CAISO, PTOs, large load developers, and others. In the coordination that will continue after the CAISO files its proposed tariff changes, the CAISO may consider if additional clarity is needed for specific co-location arrangements as projects materialize.

Accounting for co-location agreements

CDWR and the CPUC raised a related point on co-location: CDWR noted that the straw proposal does not address how large loads co-located with generation would be treated if that generation is not available and stating that the CAISO should have a mechanism in place that ensures that the full load has been studied and costs assessed consistently with load take generation beyond the co-location addition. The CPUC and CDWR questioned instances where generation co-located with large loads does not serve load as expected. The CPUC advocated for the CAISO to demonstrate that its planning processes account for the possibility that co-located generation could go offline and expose the full load to the transmission system, including resource adequacy exposure. CDWR encouraged the CAISO to have mechanisms in place to ensure that the full load, regardless of co-location agreement, has been studied to determine what transmission services are needed for these loads. The CAISO agrees with the need to

ensure that load is backed with sufficient resources and will continue coordinating with the CPUC and other local regulatory agencies on resource adequacy.

Operational considerations

The CPUC and IGNIS raised concerns regarding co-located generation and large load arrangements. The CPUC expressed concern that such configurations could introduce operational complexity, reliability risks, safety concerns, and incentives for the return of retired generation facilities, while IGNIS cautioned against the future introduction of site-definition criteria based on physical proximity or other factors that may not be reflected in existing regulatory definitions. The CAISO recognizes that co-located generation and large load configurations can present unique operational, planning, and reliability considerations. However, the purpose of this initiative is not to establish a comprehensive framework governing co-location arrangements or modify existing regulatory definitions. The CAISO will continue to monitor developments in this area and evaluate associated reliability implications through ongoing stakeholder and reliability processes.

Proposal

The CAISO proposes to clarify how co-located large loads and generation may interconnect to and operate within the CAISO-controlled grid. Such clarifications will require discussion and agreement with the PTOs. The CAISO reiterates that the PTOs will continue to govern and study all load interconnection requests pursuant to their tariffs. The CAISO, likewise, will continue to govern and study wholesale generation interconnection requests. Despite the Commission's concerns, large loads and co-located configurations have materialized in California under the current tariffs.

Nevertheless, the CAISO proposes to clarify in its tariff co-location arrangements that would not require a CAISO resource interconnection request and could be accommodated through applicable PTO or CPUC-jurisdictional retail interconnection tariffs, such as Rule 21.[52] These would include large loads with back-up generation only to be used during outages or islanding, and large loads with non-exporting behind-the-meter generation.[53] The CAISO notes that both categories would require sufficient control technologies to ensure they do not impact the transmission grid.

[52] *See* CPUC's Electric Rule 21: Generating Facility Interconnections for more information on each CPUC jurisdictional LSEs' Rule 21 tariff at https://www.cpuc.ca.gov/Rule21/.

[53] The sequencing likewise would not impact whether a CAISO interconnection study would be required.

The CAISO proposes that new or existing large loads seeking to co-locate with new generation that may export energy to the transmission grid[54] will require a CAISO interconnection study under the CAISO's Resource Interconnection Standards, Appendix KK to the CAISO tariff. This means that such resource interconnection requests would be screened and compete for capacity in the next cluster study based on the CAISO's scoring criteria.[55] However, all scoring, financial requirements, and study results would be based on the requested capacity figures the developer provides, so the developer may significantly limit the generation potentially to be exported based on how much generation will serve the large load. The CAISO tariff will require it to work with the PTOs to produce study results that reflect the combined impact of the co-located large load and generation, as requested by the developer. This is a simple extension of current rules that allow interconnection customers to be studied for a specific interconnection capacity even if their generating capacity is higher. Interconnection requests with co-located large loads may avail themselves of all rights under the Resource Interconnection Standards, including surplus interconnection service, grid enhancing technologies, phasing, etc.

Despite the ubiquity of co-located resources in California, to date, the CAISO has not received any interconnection requests for co-located load with exporting or participating generation, nor has any developer asked for such an option. The CAISO may be in a different situation than other regions that needed to impose bring-your-own generation requirements to address capacity market issues. Because the CAISO does not have a bring-your-own generation requirement and LSEs are not required to procure new capacity to interconnect new loads, developers have been less interested in co-locating load and participating generation. Additionally, to the extent large loads have brought generation to serve onsite load, they have elected to do so through tariffs for net energy metering, obviating the need for a CAISO interconnection request.

In addition to the information required in the CAISO resource interconnection request process, and the large load operational requirements discussed in Section A.4, the CAISO may require the following operational information for co-located resources, if applicable:

- Expected presence of co-located load;
- Range of energy consumption characteristics of the load;
- Minimum and maximum generator operating capabilities;
- Generator operating characteristics when the load is at its minimum level;
- Market participation status, if any; and,

[54] Frequently, constantly, or even rarely, such as in the event the Large Load is offline.

[55] As Energy Only or Deliverable. Energy Only interconnection customers not seeking reimbursement for network upgrades are not screened and proceed directly to the cluster study.

- Any load services requested when the generator is off-line

For co-located large loads and wholesale energy storage, the CAISO notes that the storage and large loads would need to be separate operationally, and all study results would reflect the same. Energy storage resources are fully dispatchable and have separate wholesale meters and settlement. Their energy could not be commingled with the large load such that the large load could take power effectively at a wholesale rate. The large load could otherwise net its withdrawals against behind-the-meter/non-participating generation and storage.[56]

All network upgrade commercial readiness deposit and generator interconnection agreement deposit requirements would treat all network upgrades and interconnection facilities as if they were required for the generation only. However, the PTO also may apply any unique deposit or financing requirements for the network upgrades and facilities required for large loads, as discussed in Section B.1 regarding cost allocation.

The CAISO also proposes to require co-located load and exporting generation studies to begin the cluster study process with the large load assumptions, but to allow Interconnection Customers interconnection customers to request removal of large load changes for the PTOs and the CAISO to evaluate whether the requested change is a material modification. (The removal or change to the Large Load would be under the PTO tariff.) In other words, after the commencement of the cluster study, the interconnection customer may request to remove the large load as a modification, and the CAISO and PTOs will evaluate whether the requested change can be accommodated. Likewise, interconnection customers already in the queue could request to add large loads as modifications, subject to PTO and CAISO evaluation, including through downsizing requests as necessary. The CAISO and PTO will assess whether either change would require complete re-studies and could not be accommodated during the study process, or if the requested modifications are material. This is not to say that the CAISO proposes to prohibit the addition of large loads to existing generation or in-progress interconnection requests; only that the interconnection customer would need to do so through the PTO tariff, and the generation interconnection study results may not be able to reflect the combined configuration if changed substantially after studies commence.

If an online CAISO generator seeks to add a large load to its site, the developer would submit the large load interconnection request to the PTO pursuant to its tariff. When ready to reflect the large load, the interconnection customer could request a post-

[56] In other words, the CAISO does not propose any change to the *status quo* for separating wholesale generation/storage and retail load or net energy metering generation/storage.

commercial operation date (COD) modification[57] or use the Master File change process as needed to assess and capture changes currently allowed under these processes.[58] The CAISO, PTO, and interconnection customer could likewise amend the generator interconnection agreement to reflect the large load and any configuration changes.

The CAISO reiterates its policy recently approved by the CAISO Board of Governors in the Interconnection Service Capacity and Deliverability Retention for Non-Operating Generating Facilities stakeholder initiative:[59]

> The ISO considers any generation that is subject to a [Participating Generator Agreement] and intends to terminate participation in the ISO wholesale market but continues generating to serve load through applicable retail programs, to also be subject to the retirement process as a generator that is permanently retiring (Retirement Scenario 3). This would include, for example, distribution-connected or transmission-connected participating resources that wish to exit from the ISO markets to serve onsite load. Although such generators will continue to produce electricity, their exit from the wholesale markets will be treated as a retirement, including triggering a reliability-must-run review.

The CAISO does not propose to change its current constructs under Order No. 888 for eligible customers to obtain transmission service. The CAISO does not have a forward capacity market, nor are LSEs required to procure capacity to obtain transmission service. Transmission service will thus continue to be assumed through an interconnection request, accounting for the large load's ability to limit its energy withdrawals or injections.[60] The large load's LSE will schedule the large load's demand with the rest of the LSE's demand through the CAISO markets, just as it does today. This will continue to enable large loads, co-located or not, to interconnect rapidly and without extra steps for transmission service. No large load developer to date has requested otherwise.

The CAISO notes that both loads and generation associated with co-located loads can be eligible for resource adequacy or demand response programs pursuant to current

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57 Section 25.5 of the CAISO tariff.

58 *See* CAISO Master File at https://www.caiso.com/systems-applications/portals-applications/master-file.

59 *See* CAISO's Interconnection service capacity and deliverability retention for non-operating generating facilities initiative at https://stakeholdercenter.caiso.com/StakeholderInitiatives/Interconnection-Service-Capacity-Deliverability-Retention-for-Non-Operating-Generating-Facilities.

60 Order to Show Cause at P 94.

program rules.[61] The CAISO does not propose changes to the eligibility criteria for participation in any of these programs. Participation in demand response programs remains a possibility for large loads. The CAISO is exploring such opportunities in the DDEMI initiative.

3. Cost Allocation for Co-Located Loads

Background and Stakeholder Comment

In the straw proposal, the CAISO included a proposal to appropriately meter and assess regulation and black start services for co-located loads, opted not to revise the current construct for behind-the-meter generation, gross load, and the TAC, and proposed enabling flexibility for large loads to take transmission services that align with their use of the transmission system (addressed in Section D).

Google and PG&E generally supported CAISO's proposal for cost allocation for co-located loads. CDWR commented that the CAISO did not address how netting behind-the-meter generation against load for TAC assessments interacts with how co-located loads are studied and assessed for interconnection service. The CPUC asserted that the CAISO did not address FERC's direction for how netting rules for behind-the-meter generation for systems greater than 50 MW should be changed in the TAC. The CAISO appreciates the complexities and concerns around cost-allocation, which extend to co-location arrangements. As mentioned in Section B, the CAISO recognizes that PTOs will be responsible for establishing tariffs that prevent cost-shifting among customers, including for co-location arrangements, while the CAISO transmission revenue requirement and TAC will continue to uphold equitable accounting and prevent cost-shifting between PTOs.

a) Ancillary Service Charges

In the Order, the Commission stated that the CAISO tariff does not appear to include a mechanism to charge large loads, and co-located loads in particular, for ancillary services commensurate with their use of such services, particularly if such customers do not withdraw energy from the transmission system.[62] Specifically, the Commission noted that co-located loads may unjustly benefit from regulation and black start services.[63]

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61 Section 40 of the CAISO tariff establishes rules about eligible capacity and uses criteria provided by the CPUC and other Local Regulatory Authorities determine what projects are RA-eligible.

62 Order to Show Cause at PP 98-99 ("As noted in the PJM Co-Location Order, this introduces the risk that costs may be allocated entirely to other transmission customers and passed through to residential customers, among others").

63 *Id*.

Proposal

The CAISO agrees that assessing ancillary service costs on a net $/MWh basis to LSEs' measured demand would enable a large load co-located with behind-the-meter generation to avoid an appropriate share of its costs for regulation and black start services.[64] That said, the CAISO already has separate rates to assess regulation[65] and black start services.[66] The issue thus becomes how to appropriately meter and assess those rates onto co-located large loads. The CAISO proposes to address this issue by requiring the PTOs to sub-meter each co-located large load independent of any onsite generation.[67] Scheduling coordinators for the LSEs serving those loads would then be required to report those meter values separately for the relevant charge codes. Each large load with co-located generation would thus pay on a gross load basis for regulation and black start services. This solution not only results in just and reasonable cost allocation, it is also relatively simple to implement because the CAISO and PTOs would not be required to calculate and assess new rates, nor would the CAISO need to create new settlement charge codes.

b) Transmission Access Charges

The Commission preliminarily found in the Order that the CAISO tariff may be unjust and unreasonable because it allows load with behind-the-meter generation to net its generation against its load for purposes of calculating Regional Access Charges.[68] The Commission explained its thinking based on the PJM co-location proceeding:

> In the PJM Co-Location Order, the Commission found that PJM's BTMG rules, which allowed load-serving entities that provide service to loads with qualifying BTMG to reduce their costs by netting output from BTMG in the calculation of their peak demand for the purpose of determining NITS charges, were unjust and unreasonable. The Commission concluded that PJM's BTMG rules were no longer consistent with cost causation principles because large loads configured in a BTMG arrangement with significant generation will raise cost shifting concerns

[64] Likewise, if the rate were assessed on a net meter basis to co-located load and participating generation, the result would be the same.

[65] Section 11.10.2.1 of the CAISO tariff.

[66] Section 11.4.2 of the CAISO tariff. The PTOs assess the costs of black start services through their PTO tariffs.

[67] The CAISO could have an exemption for co-located loads connected behind generators subject to the CAISO's Net Scheduled Participating Generator Agreement (PGA) or Qualifying Facility PGA.

[68] Order to Show Cause at P 102.

> compared to loads pursuing smaller amounts of netting. The Commission also found that such rules could lead to reliability and resource adequacy risks because PJM is obligated to serve transmission customers using BTMG but does not consider such customers in transmission and resource adequacy planning.[69]

The Commission then noted that it is "similarly concerned that CAISO's Tariff allows Eligible Customers that provide service to loads with BTMG to reduce their network service charges because the definition of gross load,[70] which is used to calculate the Regional Access Charge, excludes load of a retail customer served by its own onsite generating unit or energy storage device." The Commission directed the CAISO to explain whether the tariff remains just and reasonable even though it allows netting of behind-the-meter generation from gross load for purposes of determining Regional Access Charges for loads with behind-the-meter generation, or to propose tariff revisions. The Commission also stated the CAISO may explain why it remains just and reasonable for customers that fall below a new megawatt materiality threshold for the amount of load at a particular electrical location that network customers may net using behind-the-meter generation.[71]

Proposal

The CAISO does not propose to revise its current constructs for behind-the-meter generation, gross load, and the transmission access charges.[72] Behind-the-meter generation is far more abundant in California than in PJM, so the CAISO and California policymakers have considered this issue far more extensively. For example, in 2020, FERC approved the CAISO's proposal to amend its definition of Gross Load – the billing

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69 *Id*.

70 Appendix A to the CAISO tariff defines Gross Load as "Demand (adjusted for distribution losses) of End-Use Customer Loads directly connected to the transmission facilities or directly connected to the Distribution System of a Utility Distribution Company or MSS Operator located in a PTO Service Territory, or End Use Customer Loads directly connected to the Distribution System or transmission facilities of an EDAM Transmission Service Provider in an EDAM Entity Balancing Authority Area. Gross Load includes Load served by Excess Behind the Meter Production. Excess Behind the Meter Production shall not be netted against End-Use Customer Load in determining Gross Load." The definition also provides a list of certain loads excluded, including "Load of an individual retail customer served by its own onsite Generating Unit or energy storage device, or as authorized by Section 218 of the California Public Utilities Code;" and "Onsite Load served by a qualifying small power production facility or qualifying cogeneration facility, as those terms are defined in the FERC's regulations implementing Section 201 of the Public Utility Regulatory Policies Act of 1978."

71 Order to Show Cause at P 102.

72 Although the Commission focuses on the regional access charge, the same logic could apply to the local access charge as well.

determinant for transmission access charges – to include load served by excess behind-the-meter production, *i.e.,* behind-the-meter energy that exceeds the onsite load.[73] The CAISO amended this policy to ensure uniform settlement practices, and to ensure LSEs were allocated the correct costs of their use of the transmission system, which includes use by excess behind-the-meter generation.

The CAISO did not propose to assess transmission access charges based on gross load figures that included load served onsite by its own behind-the-meter generation. Neither the CAISO nor stakeholders in 2020 believed such loads use the transmission grid in proportion to those load figures. To the contrary, a benefit rooftop solar, onsite storage, and other behind-the-meter generation is to reduce the use of the grid and the generation across it. The CAISO does not believe this rationale has changed in light of large loads.

Perhaps more critically, the CAISO's transmission access charges are fundamentally different than the PJM transmission charges that concerned the Commission. PJM calculates and assesses its transmission charges based on certain peak demand figures. A large load with behind-the-meter generation thus could mask all of its transmission usage simply by producing generation equal to its demand during that peak period. In contrast, the CAISO assesses its transmission access charges 24/7 to each UDC based on their gross load, which consists of total end-user demand accounting for losses and excess behind-the-meter production. As such, the CAISO would allocate costs to each large load with behind-the-meter generation to the extent the large load used the transmission system, as reflected by its metered load. In other words, any energy withdrawal by the large load would be reflected in the gross load. The LSE can then easily pass down the costs of that use in the retail bill, just as every Californian with rooftop solar or home storage is billed today. Thus, the CAISO does not believe that changes to its tariff are needed to address concerns raised by FERC in the Order.

c) Transmission Service Charges

The Commission preliminarily found in the Order that the CAISO tariff lacks transmission services that would reflect the ability of Eligible Customers on behalf of large loads to take transmission services that align with their use of the transmission system, which may result in inefficient and costly transmission buildout and costs paid by transmission customers.[74]

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73 *Cal. Indep. Sys. Operator Corp.,* Docket No. ER21-190-000 (Dec. 23, 2020).

74 Order to Show Cause at P 102.

Proposal

The CAISO agrees that enabling flexibility will offer cost savings by avoiding unnecessary network upgrades, both on an interim and permanent basis. The CAISO discusses its proposed new service options in Section D, below.

D. Extending New Transmission Services to Eligible Customers Taking Service on Behalf of Flexible Large Loads

In the Order, the Commission preliminarily found that the CAISO tariff may be unjust and unreasonable because it does not include transmission services that reflect Eligible Customers taking transmission service on behalf of flexible large loads that are willing and able to limit their use of the transmission system under certain conditions, suggesting that "firm use" is essentially the only type of transmission service available in the CAISO. The Commission encouraged new transmission services be made available to reflect the operational reality that large loads may use the transmission system to differing extents and certain large loads are willing and able to limit their use of the transmission system under certain conditions.[75] At the same time, the Commission stated, "In the alternative, CAISO may explain whether, given that CAISO does not offer the transmission services required by Order No. 888, CAISO's existing transmission service framework addresses the concerns described herein, or explain what specific changes to its existing transmission service framework would effectively provide the same range of transmission service options for flexible large loads as in the PJM Co-Location Order."[76] The Commission then explained that the customer "must have necessary control technologies and/or protection systems, which may include a special protection scheme, to limit its energy withdrawals to its approved level," which are typical elements of interconnection service.[77]

Background and Stakeholder Comment

In the straw proposal, the CAISO proposed creation of two new flexible interconnection service offerings – one offered on an interim basis and one offered for permanent use, to shorten interconnection timelines and reduce interconnection costs, respectively. ACP-California, Constellation, IEPA, Microsoft, NextEra, PG&E, SCE, SEIA, Viridon, Pattern, and BAMx all expressed support for the flexible interconnection concepts. KritiGrid noted that comments on the CAISO's Issue Paper indicated significant support

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75 *Id*. at P 104.
76 *Id*. at P 103.
77 *Id*.

for exploration of flexible transmission service products. Generally, stakeholders supported both the interim and permanent flexible interconnection service concepts, with stakeholders expressing more comfort with and need for the FILI option and suggesting that the CAISO continue to explore phasing in a more permanent option in the future. KritiGrid and BAMx both expressed caution with the permanent offering, such as how such load interconnections would be financed and concern that developers would seek to transition from the permanent option to firm service as a means to reduce interconnection costs. SDG&E and PG&E shared these concerns.

The CAISO agrees that both offerings are worth pursuing, however only proposes to advance the interim option within this stakeholder initiative. The CAISO agrees with Microsoft, PG&E, SDG&E, and SCE that it should prioritize the interim option before the permanent option. The CAISO still sees potential in the permanent offering and commits to exploring it in a future initiative.

Many stakeholders, including ACP-California, Constellation, IEPA, and Microsoft, suggested additional details on the roles and responsibilities associated with implementing a flexible interconnection service, the study process for flexible interconnection, curtailment rules and obligations, operational requirements, control technologies, and cost allocation protections prior to implementation. Microsoft noted that development of a flexible service product should not divert time or resources from the higher-priority issues of study timelines, PTO coordination, energization certainty, and cost transparency. The CAISO sees value in development of this approach but applies this rationale to the decision to defer the permanent offering to a future initiative.

While SDG&E agreed to continue exploring the flexible offerings, SDG&E noted that the FERC Order did not identify deficiencies in PTO tariffs, so the CAISO should not indicate that the PTOs will create new flexible load interconnection services. SDG&E noted that it can already provide transmission-level interim load interconnection arrangements through its existing processes and suggested further consideration of the implications of compensation for accepting flexible service.

SCE broadly agreed that PTOs should offer some version of interim flexible service under their respective tariffs. PG&E noted that as part of this stakeholder process, the CAISO and PTOs that will offer a FILI service should determine what data, information, and operational control, if any, the CAISO should receive or exercise to facilitate the CAISO's role in ensuring transmission system reliability. The CAISO agrees with PG&E that the PTOs will offer the service and expects consistent implementation details across the PTO Tariffs. Specifically, PG&E expected PTOs to develop the following details of FILI:

- An overall framework in the PTO's and CAISO's respective tariffs, as appropriate, that identifies the roles and responsibilities for all impacted parties;
- A *pro forma* Flexible Interconnection Service Addendum to the *pro forma* Large Load Interconnection Agreement (or, alternatively, a *standalone pro forma* Flexible Interconnection Agreement) that identifies the roles and responsibilities for impacted parties that will identify customer- and site-specific equipment and systems necessary to operationalize FILI service;
- Study methodologies that recognize the unique operational characteristics of flexible large loads;
- Operational requirements, including curtailment implementation mechanisms and data reporting;
- Cost responsibility provisions, including any financial security during the conditional service period;
- Transition-to-firm provisions for FILI that specify the automatic conversion to firm service upon network upgrade completion;
- Coordination mechanisms between flexible interconnection service and the PTO study process; and
- Operational requirements to manage longer-duration curtailments (to be explored by the CAISO and PTOs).

The CAISO generally agrees with PG&E's characterization of PTO responsibilities as it relates to FILI and suggests additional clarity below for consideration by the PTOs in development of their tariffs.

Viridon suggested that curtailment obligations must be enforceable and the chain of authority clear: the CAISO directs, the UDC/LSE implements the curtailment with the end-use customer, and the interconnecting PTO acts only pursuant to CAISO or Reliability Coordinator operating instructions. The CAISO agrees that further clarification of roles is required and provides additional detail below. In addition, the CAISO expects to convene a working group to implement these concepts after filing with the Commission.

BAMx supported a cap on the FILI service to avoid it becoming a permanent substitute for needed transmission upgrades. The CAISO is reluctant to place a one-sized-fits-all time limitation on what is intended to be a bespoke solution tied to the specific development timeline of the associated network upgrade but expects that the load will begin receiving transmission service as soon as the associated network upgrades are complete. The CAISO points to its Transmission Development Forum and other

statewide efforts to ensure timely completion of network upgrades as a means to track network upgrade completion and ensure continued progress.

Constellation and IEPA noted that while the offerings are intended to be customized to specific load interconnection requests, the following details will be helpful:

- Curtailment triggers and operating conditions;
- How curtailment parameters will be established;
- Deployment priorities;
- Scheduling treatment;
- The relationship between operational restrictions and study assumptions;
- Potential interactions with scheduling, dispatch, and price formation; and
- How the FILI (and FLIP) may apply to co-located load arrangements and existing generation resources, particularly where load flexibility can reduce transmission impacts or support continued wholesale market participation.

Costs

The CPUC noted that CAISO has not committed to modeling market impacts of flexible vs. non-flexible large loads, which is important for the CPUC to accurately assess locational marginal price upward shifts, congestion cost increases, or local ancillary service procurement costs driven by non-flexible data center demands. Both class revenue allocation and non-compliance penalty design require detailed market impact information beyond what the CAISO has committed to providing in its straw proposal.

Control measures

Cal Advocates noted that the CAISO did not propose requirements necessary to ensure benefits materialize from flexible agreements and flow to system users. Cal Advocates states that any non-firm service agreement between the CAISO and a PTO or large load should establish the curtailable amount of a customer's load and include control requirements for the curtailment to be implemented.

Proposal

The CAISO proposes to create a new flexible interconnection service option that will enable large loads and co-located loads to limit their energy withdrawals or injections until their network upgrades are placed into service. The CAISO believes this will provide large load developers with the option to interconnect quickly through enforceable physical and operational controls to prevent transmission congestion. PTOs will play a key role in defining and implementing this interconnection service offering.

The CAISO does not propose to create new "transmission services" or more responsibilities around eligible customers, which would require redesigning transmission and interconnection service entirely. The CAISO does not believe such a redesign is warranted, and the Commission expressly invites the CAISO to explain alternative service frameworks that may enable similar flexibility.[78]

Moreover, in real time, LSEs can schedule demand as needed, including for customers limiting their use of the transmission system. With the operational data and process described in Section A.4, the CAISO can accommodate flexible loads without creating new separate classes of transmission service. This would also enable the PTOs to provide bespoke interconnection configurations for large loads, saving ratepayers from the costs of network upgrades that conform to specific "transmission services." The CAISO believes this course of action is consistent with developers' desires to interconnect quickly and affordably.

In addition to the CAISO's current generic firm service, the CAISO proposes to create a new Flexible Interim Load Interconnection (FILI) service to be implemented in close coordination with the PTOs, that will enable faster interconnections while mitigating transmission constraints. The CAISO clarifies that this interconnection service offering is not intended to address supply constraints.

The proposed FILI offering would enable large loads to interconnect flexibly and receive service up to a certain level based on grid conditions and constraints until network upgrades are complete, at which time the large load would switch over to receiving firm service. This will likely be a tailored option for each large load based on its point of interconnection and the constraints it faces, and to be developed through a contractual agreement with the PTO. For example, some FILIs may require little flexibility for a limited time because there are few, less probable contingencies. Others may require more flexibility because of transmission constraints that require network upgrades with longer timelines. The FILI option provides flexibility to the PTOs, CAISO, and developers to customize solutions. For this reason, CAISO declines to propose any kind of temporal or capacity cap on this interconnection service offering.

- This flexible interconnection service may include a number of tools or measures, including but not limited to a Remedial Action Scheme (RAS), PTO operator curtailment, or managing to a present schedule. The PTO may request automated schemes, such as a RAS, for FILI that are limited by the transmission overload under N-1-1, with CAISO and Reliability Coordinator (RC) concurrence, or

[78] *Id.* at P 101.

- The PTO will do its own load curtailment for FILI that is limited by transmission overload under N-1-1 after the first N-1 were to occur.
- If a RAS is considered but cannot be reliably operated, or is found to have significant market implications, the CAISO will not enable that option.

The CAISO plans to continue to address a number of market implications of the FILI approach in a continued stakeholder initiative, including the following.

- Visibility of FILI service to the CAISO to prevent unintended market interactions.
- Requirements for data exchange to maintain communication protocols between the CAISO and the PTOs serving large loads.

To manage coordination of development of this interconnection service offering, the CAISO will convene working groups with the PTOs, large load customers, and other interested stakeholders to maximize consistency and clarify roles and responsibilities.

The CAISO does propose control technologies and/or protection systems associated with this new service offering, which are discussed in Section A.4.

Although the CAISO is not proposing to advance the permanent flexible interconnection offering, FLIP, in this draft final proposal, the CAISO does commit to further exploration of this permanent offering in a future stakeholder initiative.

The CAISO does propose control technologies and/or protection systems associated with this new service offering, which are discussed in Section A.4.

E. Interconnection Customers Serving Electrically Proximate Large Load and Co-Located Load

The Commission preliminarily found in the Order that the CAISO tariff appears to be unjust and unreasonable because it does not contain provisions allowing an interconnection customer to seek the generator interconnection service(s) that reflects the operational dynamics of serving either: (1) an electrically proximate large load; or (2) a co-located load, as defined in the Order, that has a high peak load (i.e., large co-located loads that are 50 MW or greater).[79] The Commission defined an “electrically proximate large load” as a large load “sufficiently electrically close to the interconnection customer’s requested point of interconnection, such that the impact on the transmission system of the combination of the generating facility and the load, with the exception of the transmission facilities between the two, will be effectively the same as if they were

[79] Order to Show Cause at P 113.

located at the same substation (e.g., large load that is located no more than two substations from the generating facility)."[80]

Background and Stakeholder Comment

In the straw proposal, the CAISO did not propose creation of new provisions for interconnection customers to serve electrically proximate large loads. PG&E, SDG&E, and Microsoft agreed with this approach. The CPUC recommended that the CAISO adopt a process for jointly evaluating proximate load and generation in order to avoid costly network upgrades while preserving system reliability and providing operational benefits. Other stakeholders, primarily in the generation development community, urged the CAISO to consider service to electrically proximate loads. Developers such as AltaGas, NextEra, and SEIA noted that that large load development is in its early stages and will evolve and suggested that enabling interconnection customers to serve proximate loads would increase customer optionality, reduce transmission impacts, and accelerate service to large loads. Nearly all stakeholders suggested consideration of this pathway in a future related initiative.

The CAISO notes that it currently has a process for connecting generator interconnection request applications to non-load-serving entities (e.g. commercial and industrial consumers) in its generator interconnection process, which awards "points" in the interconnection scoring process to projects that have a commercial arrangement with a non-load-serving entity off-taker. While this process does not require any electrical or geographic requirements, it seeks to tie generation projects to loads to the extent that they have a commercial arrangement with the goal of enabling large loads to procure generation. The CAISO agrees with many stakeholders that it is worth continuing to explore the potential benefits of proximate loads, however the CAISO does not propose development of this option in this paper.

Proposal

The CAISO proposes considering provisions for interconnection customers to serve electrically proximate large loads in a future stakeholder initiative. The CAISO intends to prioritize the more common stand-alone and co-located load and generator interconnections with this proposal and filing and will focus on proximate load and generation arrangements once the process for co-location is underway.

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80 *Id*. at P 112.

2. Initiative Timeline and Next Steps

The CAISO's Large Loads Stakeholder Initiative is the primary vehicle for developing the CAISO tariff revisions necessary to comply with the Commission's Order. The CAISO refocused the initiative on the issues the Commission identified. Given the timeline described in the Order, the CAISO expedited the stakeholder initiative. The CAISO will seek Board of Governors approval at the CAISO Board's October 28, 2026 meeting. While the stakeholder initiative will be expedited, the CAISO is hosting workshops and soliciting stakeholder feedback on the proposals to better inform the policy outcomes.

Action	Tentative date
Post Straw Proposal	August 12, 2026
Stakeholder workshop	August 19, 2026
Comments due	September 2, 2026
Post Draft Final Proposal	September 24, 2026
Stakeholder workshop	October 1, 2026
Comments due	October 15, 2026
CAISO Board of Governors Decision	October 28, 2026

3. Decisional Classification

This initiative proposes certain tariff amendments to enhance the process for studying and approving interconnection requests. CAISO staff believe that these proposed tariff changes will go to the Board of Governors only and that the Western Energy Markets (WEM) Governing Body will have no role in the decision.

The WEM Governing Body has primary authority over any

> proposal to change or establish a tariff rule applicable to the WEIM/EDAM Entity balancing authority areas, WEIM/EDAM Entities, or other market participants within the WEIM/EDAM Entity balancing authority areas, in their capacity as participants in WEIM/EDAM… The scope of this joint authority excludes, without limitation, any other proposals to change or establish tariff rule(s) applicable only to the CAISO balancing authority area or to the CAISO-controlled grid.[81]

[81] Charter for WEIM and EDAM Governance § 2.2.1.

The tariff changes proposed here would not be "applicable to the WEIM/EDAM Entity balancing authority areas, WEIM/EDAM Entities, or other market participants within the WEIM/EDAM Entity balancing authority areas, in their capacity as participants in WEIM/EDAM." Rather, they would be applicable "only to … the CAISO-controlled grid."

Accordingly, these proposed changes to implement these enhancements would fall outside the scope of the WEM Governing Body's primary authority. The WEM Governing Body also has an advisory role that extends to any "proposals to change or establish tariff rules that would apply to the real-time and/or day-ahead market but are not within the scope of its primary authority." This initiative, however, does not propose changes to the rules of the real-time or day-ahead markets. Stakeholders are encouraged to submit a response in their written comments to the proposed classification as described above, particularly if they have concerns or questions.

Attachment D – Technical Working Group Proposal

Large Loads Tariff Amendment

California Independent System Operator Corporation

November 16, 2026

Large Load Technical Requirements
Straw Proposal

Large Load Technical Requirements Working Group

California ISO
Gridliance West LLC
Pacific Gas and Electric Company
San Diego Gas and Electric Company
Silicon Valley Power
Southern California Edison
Valley Electric Association, Inc

Revision: R0

June 15, 2026

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1. Introduction

The ISO's role with load interconnections being processed by utilities is primarily to ensure that proposed load interconnections are consistent with the ISO's transmission planning and do not create reliability issues on the grid. The ISO coordinates on planning for large loads with local, state, and federal regulators, and is exploring these issues with utility and industry partners in a broader stakeholder initiative. This Large Load Technical Requirements Straw Proposal is one track of a broader set of ISO-led stakeholder discussions around large loads and demand flexibility and is directionally consistent with North American Electric Reliability Corporation (NERC) and industry discussions. The ISO continues to consider large load planning, interconnection, transmission service, operational, and market issues in both the Large Load stakeholder initiative and the Demand and Distributed Energy Market Integration (DDEMI) stakeholder initiative.

The Large Load Technical Requirements Working Group (LLTRWG) was established in October 2025 by the ISO and the utilities interconnecting large data center loads within the ISO footprint, including Pacific Gas & Electric (PG&E), San Diego Gas & Electric (SDG&E), Southern California (SCE), Valley Energy Authority (VEA), and Silicon Valley Power (SVP). The purpose of the working group is to develop technical requirements for the reliable interconnection and operation of large loads connected to the ISO-controlled grid. This document is focused specifically on technical requirements associated with interconnection and reliable grid operation. It does not establish or address broader planning, market participation, scheduling, or operational requirements applicable within the ISO Balancing Authority Area (BAA), the Extended Day-Ahead Market (EDAM), or the Western Energy Imbalance Market (WEIM), nor does it include forecasting obligations or other market-related requirements. Those aspects are addressed through separate tariff provisions, business practice manuals, and market rules.

As part of this effort, the LLTRWG reviewed technical requirements, operating experience, reliability assessments, and industry guidance developed by other utilities, system operators, and industry organizations, including the NERC, the Energy Systems Integration Group (ESIG), the Electric Power Research Institute (EPRI), and others. In addition, the working group performed parametric dynamic studies on the ISO system to evaluate the potential reliability impacts associated with large loads, including AI-training data centers.

To the extent possible, LLTRWG adopted requirements consistent with existing reliability standards and other entities' requirements. Such consistency helps facilitate a more uniform approach to large load interconnection requirements across different jurisdictions. Specifically, while the ride-through capability requirements are generally aligned with the ride-through requirements specified in NERC PRC-029 for IBRs, they are not intended to exactly replicate the requirements specified in that standard.

Based on these evaluations, LLTRWG developed proposed technical requirements in the following areas:

- Frequency ride-through
- Voltage ride-through
- Post-Fault Active Power Recovery (PFAPR)
- Ramp-rate limitations
- Monitoring and telemetry requirements
- Modeling data requirements
- Commissioning, including data verification and model validation

In parallel, the LLTRWG continues to evaluate additional technical areas that may impact reliable system operation, including:

- Low-frequency cycling limits (to prevent amplification of inter-area oscillations)
- High-frequency cycling limits (to prevent triggering of Subsynchronous Resonance (SSR), Subsynchronous Torsional Interaction (SSTI), and Subsynchronous Control Interaction (SSCI))
- Restrictions on operating in constant-power mode
- Power quality requirements, including harmonics, flicker, and Rapid Voltage Change (RVC)
- Dynamic reactive power support
- Phase-angle jump ride-through capability
- Protection requirements
- Other emerging technical considerations

The LLTRWG recognizes that NERC Project 2026-02 is currently developing reliability standards for computational loads, with completion of phase 1 targeted for the end of 2026. The LLTRWG will continue to monitor the progress of that effort and will work to ensure alignment between the requirements developed through this initiative and applicable NERC reliability standards.

The term “large load” has not yet been formally defined across the industry. The requirements presented in this document are intended to apply to large computational loads, including conventional, AI-training, and crypto mining data centers interconnected to the ISO transmission system.

The requirements presented in this document establish baseline technical expectations for large loads interconnected to the ISO-controlled grid. Depending on project characteristics, electrical location, system strength, concentration of nearby large loads or inverter-based resources (IBRs), and local transmission system conditions including proximity to series-compensated lines, additional or more stringent requirements may be identified through the load interconnection study process.[1]

The LLTRWG also recognizes that industry practices, technologies, and reliability standards related to large loads continue to evolve, and the requirements presented in this document may be revised or expanded as additional operating experience, technical studies, and reliability standards become available.

A decision regarding where these requirements will ultimately be documented and enforced — whether through a tariff, ISO Business Practice Manual, utility interconnection handbooks, or another mechanism, as well as whether and to what extent existing customers would be required to comply with these technical requirements, will be made at a later stage.

Each section of this document focuses on a specific technical requirement and generally includes the following subsections:

- **Requirement** – Defines the technical requirement that the large load is expected to meet.
- **Notes** – Provides additional clarification, assumptions, or implementation considerations related to the requirement.
- **Technical Rationale** – Describes the methodology, system studies, engineering considerations, and technical basis used by the LLTRWG in developing the requirement. Where applicable, this section also explains differences between the proposed requirements and those adopted by other entities.
- **Industry Practice** – Summarizes relevant requirements, guidelines, or practices adopted or proposed by other utilities, balancing authorities, reliability organizations, or industry groups. The information provided is not intended to be exhaustive, and industry requirements are continuously evolving. The referenced requirements reflect the information available to LLTRWG at the time this document was prepared.

[1] The current assignment of responsibilities for the system under the ISO's operating control gives lead responsibilities for generation interconnection and transmission planning to the ISO, and load interconnections to the utilities. Given the utilities' lead role in load interconnections, utility federal and state tariffs and state regulations govern the study, interconnection, rates, and cost recovery for serving new loads.

2. Proposed Technical Requirements

2.1. Frequency Ride-Through

Requirement

The frequency ride-through capability requirements are provided in Table 1.

Table 1: Frequency Ride-through Capability Requirements

Frequency (Hz)	Minimum Ride-through Requirement (sec)
>61.8	May trip
>61.2	299
≤ 61.2 and ≥ 58.8	Continuous operation
<58.8	299
<57.0	May trip

Notes

- Frequency measurements shall be taken at the high side of the main power transformer (MPT).
- Frequency calculations shall be based on measurements obtained over an appropriate time window, typically ranging from 3 to 6 cycles.
- Instantaneous or single-point frequency measurements shall not be used for determining protection or control actions.
- Ride-through does not apply when the load trips in response to an ISO/TO-directed underfrequency load shedding program or RAS action. The UFLS and RAS obligation supersedes.
- The working group is continuing to evaluate appropriate Rate of Change of Frequency (RoCoF)-related ride-through requirements for large loads based on system studies, load characteristics, and industry practices.

Technical Rationale

The frequency ride-through requirements are intended to prevent unnecessary tripping of large loads during credible system disturbances and to support overall Bulk Electric System (BES) reliability. The ISO's annual frequency response studies, along with additional studies performed by the LLTRWG as part of this initiative, indicate that system frequency across the Western Interconnection is generally robust and experiences relatively limited deviations from nominal frequency, even following severe contingency events. For example, the ISO's annual frequency response assessment includes scenarios involving the simultaneous trip of two Palo Verde generating units, which represent among the most significant generation-loss events in the Western Interconnection.

The study results indicate that adopting frequency ride-through requirements generally consistent with NERC PRC-029 is technically appropriate for the ISO system and provides alignment with emerging industry practices across North America.

Industry Practice

- ERCOT, SPP, MISO, and LIPA have adopted or proposed frequency ride-through requirements that are generally similar to those presented in this document.

2.2. Voltage Ride-Through

Requirement

The voltage ride-through capability requirements are provided in Table 2.

Table 2: Voltage Ride-through Capability Requirements

Voltage (per unit)	Minimum Ride-through Requirement (sec)
>1.2	May trip
>1.1	2.0
≤ 1.1 and ≥ 0.9	Continuous operation
<0.9	6.0
<0.7	3.0
<0.5	1.2
<0.25	0.15

Notes

- The voltage base used for per-unit calculations shall be the nominal phase-to-phase or phase-to-ground transmission system voltage, as applicable.
- The applicable voltage for evaluating compliance with Table 2 shall be the maximum or minimum fundamental-frequency root mean square (RMS) voltage, measured phase-to-phase or phase-to-neutral at the high side of the main power transformer (MPT).
- Instantaneous trip settings based on voltage measurements with filtering durations shorter than one cycle (16.6 milliseconds) are not permissible.
- At any given voltage value, the large load shall Ride-through unless the time duration at that voltage has exceeded the specified minimum Ride-through duration. If the voltage is continuously varying over time, it is necessary to add the duration within each band of Tables 2 over any 10 second time period.
- The specified duration in Tables 2 is cumulative over one or more disturbances within any 10 second time period.
- Temporary reductions in active power consumption during and after voltage disturbances could occur due to UPS operation, or transitions to backup generation. The LLTRWG is continuing to evaluate and define acceptable levels of temporary power reduction and current increase while operating within the ride-through zones.
- Ride-through does not apply when the load trips in response to an ISO/TO-directed undervoltage load shedding scheme or RAS action. The UVLS and RAS obligation supersedes.

Technical Rationale

The voltage ride-through requirements are intended to minimize unnecessary disconnection of large loads during transmission disturbances and to support reliable BES performance during and following system faults and disturbances.

The ride-through requirement of 6 seconds for the voltage range $0.7 \leq V < 0.9$ pu is generally consistent with the requirements specified in NERC PRC-029 for IBRs and is based on parametric dynamic studies performed on the ISO system. The study results demonstrated that, due to the dynamic characteristics of the load response in certain areas of the ISO footprint, voltage recovery following certain three-phase faults may take 6 seconds or longer to recover above 0.9 pu under specific operating conditions and contingency scenarios.

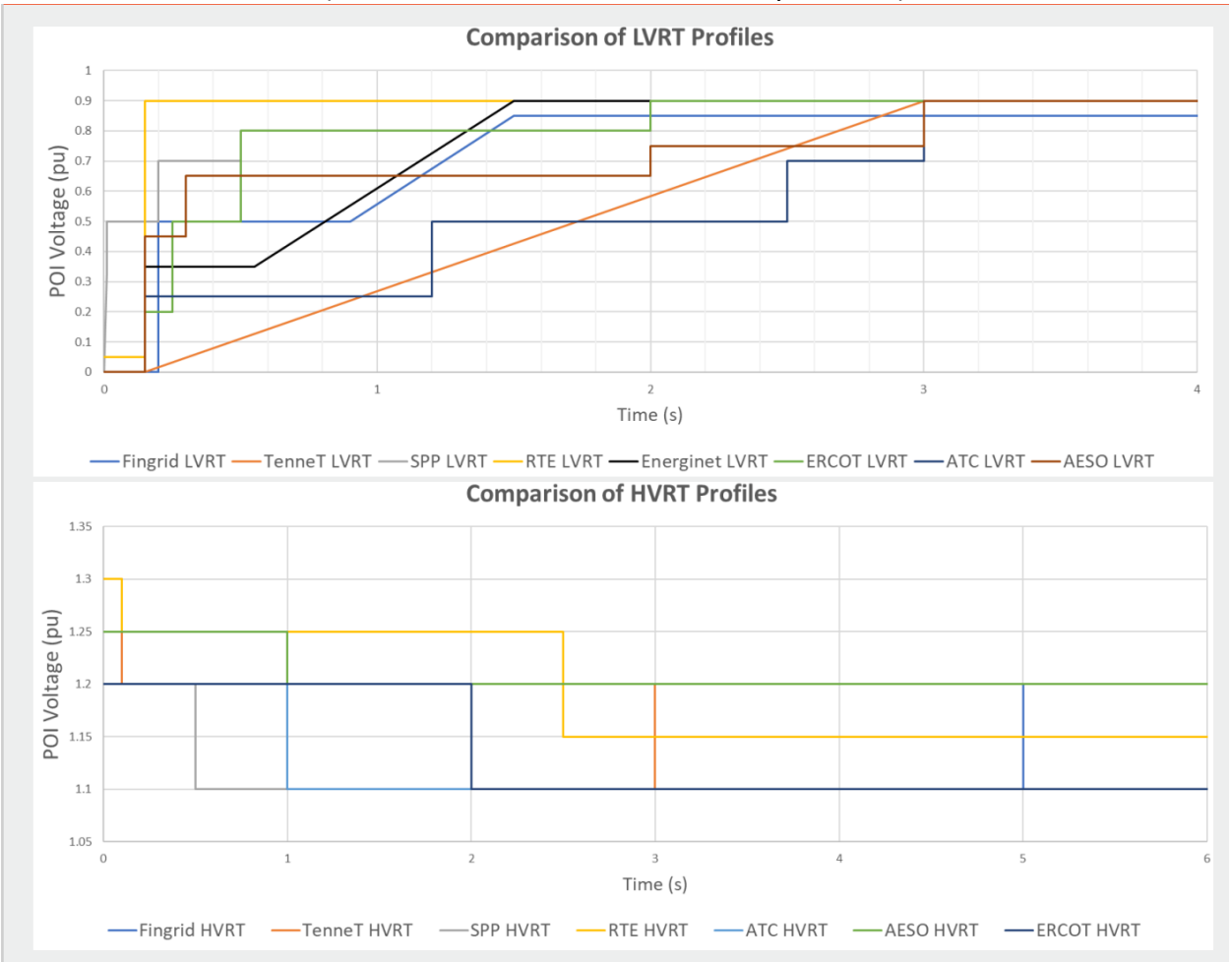
Although some utilities and balancing authorities have adopted shorter ride-through durations for this voltage range, the LLTRWG concluded that adopting a 6-second ride-through requirement is appropriate for the ISO system to avoid unnecessary tripping of large loads during severe but credible system disturbances.

The ride-through requirement of 2 seconds for the overvoltage range $1.1 < V \leq 1.2$ pu is more conservative than the corresponding 1-second requirement specified in PRC-029 for IBRs. This requirement reflects the fact that, under the ISO Planning Standards, steady-state transmission voltages may approach 1.1 pu under certain operating conditions. In addition, dynamic studies performed by the LLTRWG indicated that temporary overvoltage conditions above 1.1 pu may persist for durations exceeding 1 second following major disturbances or switching events. As a result, a 2-second ride-through capability was determined to be appropriate for large loads interconnected to the ISO-controlled grid.

Industry Practice

- Voltage ride-through requirements vary significantly across utilities, balancing authorities, and system operators due to differences in system characteristics, operating practices, and reliability considerations.
- Figure 1 summarizes voltage ride-through requirements adopted or proposed by several entities as of early 2026. These requirements continue to evolve as utilities and reliability organizations gain additional operating experience with large loads.

Figure 1: Low Voltage Ride-Through Requirements
(Source ESIG Presentation, February 11, 2026)



2.3. Post Fault Active Power Recovery (PFAPR)

Requirement

Large loads shall recover to at least 90% of their pre-disturbance active power level within 3 seconds after the post-fault voltage at the Point of Interconnection (POI) recovers to 0.9 pu or greater.

Notes

- Sustained or repeated reductions in active power after initial recovery are not allowed.
- Additional project-specific requirements may be established where studies identify potential reliability concerns associated with delayed or coordinated load recovery behavior.
- The PFAPR requirement applies to the aggregate active power consumed from the transmission system at the POI.
- If all or part of the large load is required to trip due to RAS action following the fault, the large load will be required to recover to at least 90% of, their pre-disturbance active power level minus the load required to trip due to RAS action, within 3 seconds.
- If all or a portion of the large load is required to trip due to RAS operation following a fault, the required PFAPR level shall be at least 90% of the remaining pre-disturbance load after the RAS-related load reduction, within 3 seconds after the post-fault voltage at the POI recovers to 0.9 pu or greater.

Technical Rationale

To maintain continuity of computational processes during transmission disturbances, many large load facilities, particularly AI-training data centers, incorporate UPS systems and onsite backup generation. These systems are typically designed to maintain uninterrupted service to sensitive computing equipment during voltage disturbances or other grid events.

As part of their control strategy, the facility energy management or site control system may interpret a transient voltage disturbance as a sustained voltage drop and transfer all or a portion of the facility load from the grid to UPS systems or onsite backup generation. While this approach improves the reliability and resiliency of the computational load from the customer perspective, it can create reliability concerns for the BES. From the grid perspective, such actions appear as a sudden and potentially significant loss of load.

The reliability impact becomes more significant when multiple large load facilities are electrically concentrated within the same geographic area or transmission corridor and respond similarly to system disturbances. Simultaneous or coordinated reductions in grid-supplied load following a disturbance can result in undesirable system voltage and frequency response.

The PFAPR requirement is intended to minimize these risks by ensuring that large loads restore their active power consumption following fault clearing and system voltage recovery, within a

defined time. Establishing a minimum active power recovery performance helps maintain predictable system behavior during disturbances and reduces the risk of adverse interactions between large loads and the transmission system.

Industry Practice

- ERCOT: Requires restoration of at least 90% of pre-disturbance active power within 2 seconds.
- AESO: Specifies a default active power recovery time of 1 second, with the capability to adjust the requirement up to 10 seconds depending on system strength and local reliability considerations.

2.4. Ramp Rate Limit

Requirement

The average active power ramp rate of the large load, measured over a rolling 10-minute interval, shall not exceed 20 MW/min.

Notes

- One objective of this requirement is to limit the collective impact of large loads on:
    - Real-time regulation reserve procurement requirements
    - Interconnection frequency variations within the ±0.036 Hz deadband, beyond which PFR from generators across the Western Interconnection may be triggered.
- Separate requirements may be established to limit faster load variations associated with short-duration cycling, pulsating load behavior, or oscillatory characteristics of the load.
- The ramp-rate requirement applies to normal operating conditions, including routine operational changes and restoration following outages, but does not apply to automatic responses to faults or disturbances required for equipment protection or fault ride-through performance.

Technical Rationale

Each Balancing Authority (BA) is responsible for maintaining its Area Control Error (ACE) below a limit by continuously balancing generation and load within its system. This balancing function is primarily achieved through the procurement and dispatch of regulation reserves capable of responding rapidly to short-term changes in system conditions.

Large loads, particularly AI-training data centers, can exhibit substantial variations in power consumption over relatively short timeframes. Without appropriate ramp-rate limitations, the aggregate behavior of these loads could significantly increase the amount of regulation reserve capacity required to maintain reliable system operation. Such impacts could exceed the regulation requirements traditionally associated with managing variability from conventional load behavior and intermittent generation resources.

In addition, rapid changes in load directly affect Interconnection frequency. Gradual changes can typically be managed through normal regulation service response; however, sufficiently rapid load changes may exceed the response capability of regulation reserves and frequently trigger PFR from generators throughout the Western Interconnection. Frequent activation of PFR can increase mechanical wear on generating equipment and reduce operational flexibility.

The proposed ramp-rate limitation is therefore intended to reduce unnecessary triggering of PFR, limit excessive regulation reserve requirements, and support predictable system operation during normal load variations. The requirement applies to day-to-day operation of large loads, including ramping associated with startup, shutdown, restoration following outages.

The LLTRWG also recognizes that certain large loads may exhibit significant power fluctuations over shorter timeframes, including second-to-second variations and oscillatory behavior. As a result, industry practice is evolving toward establishing additional requirements addressing short-duration load cycling and high-frequency power variations to ensure reliable operation of the BES.

Industry Practice

- ERCOT: 20 MW/min
- ATC: Any active power change greater than 50 MW must be limited to a ramp rate of less than 0.5 MW/s (30 MW/min)
- AESO: 10 MW/min
- Southern Company: 20 MW/min. In addition, the top quartile (P75) of active power ramp rate, as averaged across consecutive 1-minute periods, should also not exceed 20 MW/min.

2.5. Monitoring and Telemetry

Requirement

High-resolution monitoring and telemetry equipment, including Phasor Measurement Units (PMUs), Digital Fault Recorders (DFRs), and SCADA systems shall be installed at each Main Power Transformer (MPT) associated with the large load interconnection.

Notes

- Interconnection studies may identify the need for additional monitoring capabilities depending on reliability risks.
- PMU and SCADA measurements shall be streamed in real time to the interconnecting Transmission Owner (TO).
- DFR measurements shall be retained for a minimum of 30 days and provided to the TO upon request within 10 days.
- Depending on the results of the interconnection studies, the interconnecting TO may require additional monitoring, control, or protective systems to maintain BES reliability. Such systems may include automated schemes designed to reduce or disconnect portions of the large load during abnormal system conditions.

Technical Rationale

The rapid pace of large load interconnections within the ISO footprint, combined with the limited industry operating experience with such facilities, particularly AI-training data centers, creates a need for enhanced system visibility and high-resolution monitoring capabilities.

Large loads may exhibit fast-changing power consumption characteristics, complex interactions with power electronic equipment, and coordinated responses to transmission disturbances that may contribute to unexpected dynamic performance, oscillatory behavior, or other reliability concerns that may not be fully observable through conventional SCADA measurements alone.

The installation of high-resolution monitoring equipment, including PMUs, and DFRs, provides the ability to capture dynamic system behavior during both normal operation and disturbance conditions. Real-time streaming of monitoring data supports operational awareness, event analysis, oscillation detection, model validation, and identification of abnormal system interactions. These measurements also support post-event engineering analysis and facilitate the development of mitigation measures when reliability concerns are identified.

The LLTRWG believes that enhanced monitoring and telemetry capabilities are important to ensure that any unexpected interactions between large loads and the transmission system can be identified and addressed promptly through automated protection systems, operational actions, or future design improvements.

Industry Practice

- ERCOT: Requires installation of PMUs, Sequence of Events (SOE) recording equipment, and Digital Fault Recorders (DFRs).
- ATC: Requires monitoring of the aggregate large load facility at sufficient resolution and to retain at least 90 days of operational data.
- AESO: Requires installation of PMUs and real-time streaming of specified synchrophasor measurements.
- Southern Company: Requires monitoring equipment, including PMUs, Advanced Digital Fault Recorders (ADFRs), and Continuous Wave Streaming devices, to support wide-area oscillation detection at the Point of Connection unless determined otherwise by Southern Company Transmission.

2.6. Modeling Data

Requirement

Attachment A identifies the modeling and technical data that large load interconnection customers are required to provide to the interconnecting Transmission Owner (TO) to support system impact studies and reliability assessments. Depending on the project characteristics and study phase, the TO may require submission of power flow, dynamic, short-circuit, and/or EMT models and associated technical data.

Notes

- The modeling data requirements are generally aligned with the NERC large load modeling data questionnaire and related industry guidance documents.
- Additional load profile information, control system details, operational characteristics, or model data may be required by the interconnecting TO based on the characteristics of the load, system conditions, or study results.
- The TO may require updated or revised models during different phases of the interconnection process, including planning, commissioning, and post-commercial operation model validation activities.
- Submitted models and technical data shall accurately represent the expected steady-state and dynamic performance of the facility, including any load management systems, UPS systems, onsite generation, or other control systems that may impact system behavior during normal or disturbance conditions.
- Where applicable, EMT models shall include sufficient detail to support evaluation of fast dynamic interactions, converter and UPS behavior, control system performance, harmonic impacts, and other sub-cycle phenomena relevant to system reliability.

Technical Rationale

Accurate modeling data is essential to enable the interconnecting TO and the ISO to perform reliable system impact studies and evaluate the potential effects of large loads on the BES. Depending on the size, location, and operating characteristics of the project, large loads may significantly influence steady-state power flows, system dynamics, voltage performance, frequency response, fault behavior, oscillatory performance, and electromagnetic transient interactions.

The requested modeling information and supporting technical data enable the TO to perform detailed planning, operational, protection, and reliability studies across multiple simulation domains, including power flow, transient stability, short-circuit, and EMT analysis. Accurate models are particularly important for evaluating facilities with rapidly varying load behavior, complex power electronic equipment, UPS systems, onsite generation, or advanced control systems.

In addition, validated and up-to-date models support ongoing planning assessments, operational studies, disturbance analysis, and future reliability evaluations as system conditions evolve over time.

Industry Practice

Other entities have established similar load modeling and technical data submission requirements for large load interconnections.

2.7. Commissioning

Requirement

Large load interconnection customers shall provide written commissioning and testing procedures to the interconnecting Transmission Owner (TO) prior to energization and commercial operation for TO's review and approval. The commissioning process shall include verification of load characteristics, validation of applicable models, and demonstration of compliance with the technical requirements specified in this document.

Notes

At a minimum, the commissioning and testing process shall include the following:

- Validation of load profiles and operational behavior to demonstrate compliance with applicable ramp-rate and load variability requirements.
- Validation of power flow, dynamic, and, where applicable, EMT models used in the interconnection studies.
- Verification that any protection, control, or remedial action systems designed to reduce or disconnect portions of the large load operate as intended.
- Verification of monitoring and telemetry systems, including PMU, SCADA, DFR, as applicable.
- Submission of commissioning test results, disturbance recordings, and model validation data to the interconnecting TO and ISO upon request.
- Additional commissioning or performance verification requirements may be established based on project-specific reliability considerations identified during the interconnection study process. If the interconnection study identifies stability risk, the commissioning process shall include an EMT model validation exercise using approved simulation tools.
- If certain validations or performance verifications cannot be completed during the initial commissioning phase, the commissioning and testing procedure document shall identify which tests are deferred, the schedule for completing those tests, and the basis for concluding that the deferred testing will not adversely impact system reliability or the validity of the interconnection study assumptions.
- If the large load facility does not satisfy the applicable commissioning or technical requirements, the interconnecting TO may require corrective actions, operational limitations, additional studies, mitigation measures, or re-validation activities prior to or following commercial operation.

Technical Rationale

Large loads may have a significant impact on the reliable operation of the system. As a result, it is important to ensure that the actual operating characteristics of the facility are consistent with the assumptions, models, and performance characteristics used during the interconnection studies.

A coordinated and comprehensive commissioning process provides the opportunity to validate facility performance under actual operating conditions, verify the accuracy of submitted models and load data, and confirm that protection, control, and monitoring systems operate as intended. This process also helps identify potential discrepancies between expected and actual facility behavior before the project enters normal operation.

Validation of load profiles, ramp-rate behavior, disturbance response, telemetry systems, and applicable power system models improves the accuracy of future planning and operational studies and supports reliable system operation following commercial energization.

The commissioning process is also intended to establish sufficient operational visibility to support ongoing monitoring, event analysis, and future model validation activities.

Industry Practice

- Southern Company: The “Integration Process for Transmission-Connected Large Loads” includes detailed commissioning, testing, monitoring, and performance verification requirements for large load interconnections.

3. Technical Requirements Under Development

The LLTRWG continues to evaluate additional technical requirements associated with large loads and their potential impact on reliable operation of the system. The following sections summarize technical areas currently under development.

3.1 Low Frequency Cycling

Requirement

To be determined.

Notes

The objective of this requirement is to prevent amplification of inter-area oscillations, avoid adverse interactions with generator controls and system damping characteristics, and minimize unnecessary activation of balancing and frequency response resources.

The following topics are being considered for this requirement:

- Magnitude and duration of low-frequency active power variations
- Frequency-domain characteristics of load oscillations
- Aggregate behavior of geographically concentrated large loads
- Potential interactions with weak-grid conditions, IBRs, and existing system oscillatory modes.

Technical Rationale

Large loads, particularly AI-training data centers, may exhibit periodic or oscillatory active power behavior over timeframes ranging from several seconds to multiple minutes. If not properly managed, coordinated or sustained low-frequency load cycling could interact with existing electromechanical oscillation modes within the transmission system and potentially reduce system damping or amplify inter-area oscillations.

Traditional load models and operating practices have historically assumed relatively smooth aggregate load behavior. Additional technical requirements may be necessary to ensure that large loads do not introduce undesirable oscillatory characteristics into the power system.

Industry Practice

- ATC and SPP: Require active power variations to remain below 25 MW over a 5-second interval.
- Southern Company: Requires active power variations to remain below 10 MW over a 4–6 second interval.

- ERCOT: Have proposed limiting active power variations to less than 10 MW over a 5-second interval.
- LIPA: Requires frequency-domain content in the 0.1–5 Hz range to remain below 10 MW and content in the 5–55 Hz range to remain below 3.5 MW.

3.2 High Frequency Cycling

Requirement

To be determined.

Notes

The objective of this requirement is to prevent adverse interactions between large loads and transmission system, IBRs, synchronous generator shaft systems, and power electronic controls.

The following topics are being considered for this requirement:

- Frequency-domain characteristics of load variations and oscillatory behavior
- Potential excitation of SSR, SSTI, SSCI, or other oscillatory phenomena
- Interactions between large loads and IBRs, FACTS devices, HVDC systems, or series-compensated transmission facilities
- Appropriate Fast Fourier Transform (FFT)-based methodologies, filtering techniques, averaging windows, and performance metrics
- The aggregate impact of geographically concentrated large loads operating with similar control characteristics.

Technical Rationale

Large loads, particularly AI-training data centers and facilities utilizing high-speed power electronic equipment, may exhibit active power fluctuations across a wide range of frequencies. Such variations may interact with existing oscillatory modes of the transmission system or excite resonant conditions that could negatively impact system reliability.

Of particular concern are interactions involving IBRs, series-compensated transmission lines, FACTS, HVDC converter controls, and generator shaft torsional modes. Under certain conditions, repetitive or sustained high-frequency cycling behavior may contribute to adverse dynamic interactions, reduced system damping, equipment stress, or unintended operation of protection and control systems.

The reliability risk associated with high-frequency cycling behavior is expected to be system-dependent and may vary significantly based on system configuration and operating conditions.

Industry Practice

- ATC, SPP, and MISO: Require system impact studies to demonstrate that large loads do not create adverse reliability impacts on the system.

- Southern Company: Requires the frequency-domain content of the load profile, calculated using FFT analysis, to remain below specified limits across multiple frequency bands, including 0.1–0.5 Hz, 0.5–0.8 Hz, 0.8–2 Hz, and 5–55 Hz.
- LIPA: Requires frequency-domain content in the 0.1–5 Hz range to remain below 10 MW and content in the 5–55 Hz range to remain below 3.5 MW.

3.3 Limits on operating in constant power mode

Requirement

To be determined.

Notes

The following topics are being considered for this requirement:

- The dynamic behavior of power electronic load controls during voltage disturbance
- Potential impacts on transmission system voltage recovery and system stability
- Interactions with IBRs and weak-grid conditions
- The aggregate effect of multiple large loads operating with similar control characteristics
- Appropriate operational limitations or control requirements during transient voltage events.

Technical Rationale

Many large loads utilize power electronic interfaces and control systems designed to maintain relatively constant active power consumption over a wide range of operating conditions. During voltage depressions, constant power operation may cause the load to draw increased current from the transmission system to maintain its active power consumption.

Under certain system conditions, this behavior may negatively impact voltage recovery following disturbances, increase reactive power demand, reduce system damping, or contribute to voltage instability. The aggregate response of multiple large loads operating in constant power mode may further amplify these effects.

The potential reliability impacts are expected to depend on several factors, including system strength, load composition, control system design, disturbance severity, and the dynamic interactions between large loads and nearby generation resources.

Industry Practice

- ATC and SPP: Do not permit operation in constant power mode during voltage sag conditions due to concerns regarding adverse impacts on transmission system reliability and voltage recovery performance.

3.4 Power Quality (harmonic, flicker, Rapid Voltage Change, ...)

Requirement

To be determined.

Notes

The following topics are being considered for this requirement:

- Harmonic current and voltage distortion
- Voltage flicker and Rapid Voltage Change (RVC)
- Subharmonic and interharmonic emissions
- Power quality impacts associated with rapidly varying loads
- Continuous power quality monitoring and reporting requirements
- Potential cumulative impacts resulting from geographically concentrated large loads.

The LLTRWG is also evaluating appropriate measurement methodologies, compliance criteria, monitoring requirements, and applicable industry standards for power quality performance.

Technical Rationale

Large loads, particularly AI-training data centers, may contribute to harmonic distortion, flicker, rapid voltage fluctuations, interharmonics, and other waveform abnormalities that may adversely affect transmission equipment, customer loads, IBRs, and overall system reliability.

The potential impact of power quality disturbances depends on several factors, including facility size, load composition, converter technologies, local system strength, network impedance characteristics, and the aggregate behavior of nearby large loads and IBRs.

As the penetration of large loads increases, the cumulative impact of harmonics and rapidly varying load behavior may become more significant, particularly in electrically weak areas of the system. Continuous monitoring and appropriate technical limits may therefore be necessary to ensure acceptable system performance and compliance with applicable reliability and power quality standards.

Industry Practice

- ATC, Dominion, AEP, and AESO: Require compliance with IEEE 519-2022 harmonic limits at the Point of Common Coupling (PCC), IEEE 1453 flicker and Rapid Voltage Change (RVC) limits, and continuous power quality monitoring at the POI.
- ERCOT and SPP: Are expected to propose similar power quality requirements for large loads.

3.5 Power Factor and Dynamic reactive support

Requirement

To be determined.

Notes

The following topics are being considered for this requirement:

- Steady-state power factor requirements at the POI
- Dynamic reactive power performance during normal and system disturbance conditions
- Voltage support capabilities during transmission contingencies and voltage disturbance events
- Coordination with IBRs and nearby reactive support devices
- Reactive power impacts associated with rapidly varying loads
- The aggregate impact of geographically concentrated large loads on local and system-wide voltage performance.

Technical Rationale

Large loads may have a significant impact on transmission system voltage performance and reactive power requirements. Depending on their operating characteristics, large loads may contribute to increased reactive power demand, voltage fluctuations, reduced voltage stability margins, and degraded post-disturbance voltage recovery performance.

Many large loads utilize power electronic equipment, UPS systems, and advanced control systems that may dynamically influence reactive power consumption and voltage behavior during both normal operation and system disturbances. As the penetration of these facilities increases, maintaining acceptable voltage performance and reactive power balance across the transmission system may require additional technical requirements related to steady-state power factor operation and dynamic reactive support capabilities.

Industry Practice

- Based on section 8.2.3.3 (Voltage Support) of the ISO Tariff:

"… All Loads directly connected to the CAISO Controlled Grid shall maintain reactive flow at grid interface points within a specified power factor band of 0.97 lag to 0.99 lead. Loads shall not be compensated for the service of maintaining the power factor at required levels within the bandwidth. A UDC interconnecting with the CAISO Controlled Grid at any point other than a Scheduling Point shall be subject to the same power factor requirement..."

- SPP, ATC, LIPA, and AESO: Require operation within a ±0.95 power factor range at the POI.
- MISO: Has proposed a ±0.95 power factor requirement at the POI.
- Southern Company: Requires operation within a ±0.90 power factor range at the POI.

3.6 Phase Angle Jump Ride Through

Requirement

To be determined.

Notes

The following topics are being considered for this requirement:

- The ability of large loads to remain connected during transient phase angle shifts resulting from system disturbances, switching events, or fault clearing
- Potential interactions between load control systems, UPS systems, IBRs, and protection systems during phase angle disturbances
- Appropriate ride-through limits, measurement methodologies, and performance criteria
- The aggregate impact of load responses to phase angle disturbances in electrically weak areas or regions with high concentrations of large loads.
- Utilizing IEEE-2800 requirement on phase angle jump ride-through as a reference.

Technical Rationale

Transmission system disturbances, fault clearing events, switching operations, and network reconfigurations may result in temporary phase angle shifts across the transmission system. Depending on the magnitude and rate of the phase angle change, sensitive load control systems, UPS equipment, synchronization controls, or protection systems may respond by reducing load, transferring to backup systems, or disconnecting from the grid.

Large loads may be particularly sensitive to such disturbances. Coordinated or widespread responses to phase angle jumps could potentially result in sudden changes in active or reactive power consumption, undesirable dynamic interactions, or reduced system stability margins.

Industry Practice

Industry practices and technical requirements related to phase angle jump ride-through for large loads are currently evolving. The LLTRWG continues to monitor industry developments, utility requirements, and emerging reliability standards in this area.

3.7 Protection Requirements

Requirement

To be determined.

Notes

The following topics are being considered for this requirement:

- Protection system coordination between large loads and the transmission system
- Voltage, frequency, and Rate of Change of Frequency (RoCoF)-based protection settings
- Coordination of load protection systems with ride-through requirements and system reliability objectives
- Protection system behavior during transmission faults, switching events, oscillatory conditions, and abnormal system conditions
- The use of remedial action schemes, load-shedding schemes, or special protection systems to maintain system reliability
- The aggregate impact of coordinated or simultaneous operation of protection systems associated with multiple large loads.
- For any customer back up generation including UPS that will only operate when the large load is isolated from the interconnecting TO System (e.g., in island-mode), the large load will be required to install interlocks acceptable to the TO to prevent the customer-owned generation from coming on-line or generating when the large load is synchronized to the TO system.

Technical Rationale

Protection systems associated with large loads can significantly influence transmission system performance during disturbances and abnormal operating conditions. Improperly coordinated or overly sensitive protection settings may result in unnecessary or widespread disconnection of large loads following transmission faults, voltage depressions, frequency excursions, oscillatory events, or other system disturbances.

Because large loads may represent concentrated demand as an aggregate, simultaneous or coordinated tripping of these facilities could result in sudden load loss, excessive frequency and voltage excursions, and other adverse impacts on reliability.

In addition, many large loads utilize advanced control architectures that may introduce complex interactions between facility-level protection systems and transmission system dynamics. Protection system coordination is therefore important to ensure that the facility appropriately

distinguishes between disturbances that require equipment protection and those for which continued ride-through operation is necessary to support reliable system performance.

Industry Practice

Industry practices and technical requirements related to protection systems for large loads continue to evolve. Utilities, balancing authorities, and reliability organizations are actively evaluating appropriate protection coordination requirements, ride-through expectations, and remedial action approaches for large load interconnections.

3.8 Other Emerging Technical Requirements

Requirement

To be determined.

Notes

Potential future areas of evaluation may include, but are not limited to:

- Emerging dynamic performance characteristics associated with large loads
- Interactions between large loads and IBRs, HVDC systems, FACTS devices, and advanced transmission technologies
- Advanced monitoring, telemetry, and real-time performance assessment requirements
- Cybersecurity and operational coordination considerations associated with large load facilities
- Aggregated impacts of geographically concentrated large loads on system reliability and operational flexibility
- Additional reliability requirements identified through NERC standards and guideline development activities, disturbance investigations, or industry operating experience.
- Coordinated or simultaneous loss of large loads across multiple facilities resulting from common-mode IT, communication network, cloud-service, control system, or cybersecurity events, rather than transmission system disturbances, may present unique reliability risks to the BES. The LLTRWG may evaluate whether additional operational, coordination, monitoring, or performance requirements are necessary to address such scenarios.
- The interconnecting TO may require updated studies, revised modeling data, or additional operational coordination requirements when significant changes occur to facility configuration, operating characteristics, control systems, or load behavior following commercial operation.

Technical Rationale

As industry practices, technologies, and system conditions continue to evolve, new reliability considerations may emerge that are not fully addressed by existing planning criteria, operating practices, or technical requirements.

The large scale, rapid growth, and increasingly dynamic behavior of these facilities may create new operational and planning challenges for the grid.

Given the evolving nature of these technologies and the limited long-term operating experience currently available, the LLTRWG believes it is important to maintain flexibility to develop additional technical requirements as necessary to support reliable system operation.

Industry Practice

Many entities are actively evaluating additional reliability requirements beyond those currently established, particularly in areas related to dynamic performance, oscillatory behavior, power quality, monitoring, protection coordination, and advanced control system interactions.

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5. Acronym Definitions

Acronym	Definition
ACE	Area Control Error
ADFR	Advanced Digital Fault Recorder
BA	Balancing Authority
BES	Bulk Electric System
CAISO	California Independent System Operator
DFR	Dynamic Fault Recorder
EMT	Electromagnetic Transient
ESIG	Energy Systems Integration Group
FACTS	Flexible AC Transmission Systems
FFT	Fast Fourier Transform
HVDC	High-Voltage Direct Current
IBR	Inverter-Based Resource
LLTRWG	Large Load Technical Requirements Working Group
MPT	Main Power Transformer
PCC	Point of Common Coupling
PFAPR	Post-Fault Active Power Recovery
PFR	Primary Frequency Response
PMU	Phasor Measurement Unit
POI	Point of Interconnection
RMS	Root Mean Square
RoCoF	Rate of Change of Frequency
RVC	Rapid Voltage Change
SCADA	Supervisory Control and Data Acquisition
SOE	Sequence of Events
SSR	Subsynchronous Resonance
SSCI	Subsynchronous Control Interaction
SSTI	Subsynchronous Torsional Interaction
TO	Transmission Owner
UPS	Uninterruptible Power Supply

Attachment E – Board Memorandum

Large Loads Tariff Amendment

California Independent System Operator Corporation

November 16, 2026

Memorandum

To: ISO Board of Governors

From: Neil Millar, Vice President Transmission Planning and Infrastructure Development

Date: October 22, 2026

Re: **Response to FERC Large Loads Order to Show Cause**

This memorandum requires ISO Board of Governors action.

EXECUTIVE SUMMARY

The Large Load Enhancements draft final proposal and upcoming filing responds to the Federal Energy Regulatory Commission (FERC) Order to Show Cause on Large Loads. Taken together, the ISO and participating transmission owner filings provide the tariff-level clarity, customer protections, and operational tools the Order seeks. They represent evolution without requiring revolution. The result is a comprehensive near-term response to the Order that can accelerate viable large-load projects without compromising reliability, affordability, or non-discriminatory access.

In the draft final proposal, the ISO describes five key areas where ISO leadership and engagement is necessary to enable innovation while protecting customers and ensuring safe and reliable service:

1. Procedures to improve coordination related to load interconnection applications, studies, technical standards, and operational requirements for accurate long-term planning and near-term reliability.
2. A workable framework to prevent cost shifting, and through which the participating transmission owners can develop just and reasonable deposit, financing, and other cost allocation structures within their tariffs.
3. Parallel information and application requirements for co-located load and generation arrangements in the ISO's resource interconnection process to align with participating transmission owner load interconnection studies.

4. Flexible interim load interconnection (FILI) service to allow large loads to interconnect quickly to the transmission system while waiting for network upgrade completion.
5. Future policy development to study generating facilities serving large loads with electrically proximate generation.

FERC's Order and the ISO's draft final proposal respect the current assignment of responsibilities for the system in which participating transmission owners primarily manage the load interconnection study and financing, so the ISO's draft final proposal addresses topics that intersect with the ISO's core functions; proactive transmission planning, co-located generator interconnection, and operational reliability. The ISO expects additional complementary compliance information from participating transmission owners to ensure a coordinated and seamless process to interconnect new large loads.

Moved, that the ISO Board of Governors approves the proposed large loads enhancements, as described in the memorandum dated October 22, 2026; and

Moved, that the ISO Board of Governors authorizes Management to make all necessary and appropriate filings with the Federal Energy Regulatory Commission to implement the proposal, including any filings that implement the overarching initiative but contain discrete revisions to incorporate Commission guidance in any initial ruling on the proposed tariff amendment.

DISCUSSION AND ANALYSIS

On June 18, 2026, the Federal Energy Regulatory Commission (FERC) issued six tailored orders to show cause under Section 206 of the Federal Power Act to each of the six regional grid operators under its jurisdiction, including the ISO. An order to show cause is a preliminary finding that a tariff may be unjust and unreasonable, placing the onus on the recipient to defend or modify its tariff as needed. The order to show cause (Order) directed the ISO/RTOs focuses on five central concerns, which the ISO addressed in its draft final proposal. The ISO also met the first of the Commission's compliance requirements with submission of an Informational Report on Resource Sufficiency,[1] describing recent attention to resource adequacy (RA), generation development, transmission expansion, and load and generator interconnection processes.

[1] *See* ISO Informational Report - Large Loads and Co-located Loads at https://www.caiso.com/documents/jul-20-2026-informational-report-large-loads-and-co-located-loads-el26-71.pdf.

As directed by FERC, the ISO is coordinating closely with state energy agencies to complement their regulatory proceedings, as well as with the participating transmission owners to ensure a fair and consistent application of requirements and procedures across the ISO system. Such complementarity is critical to enabling proactive planning, consistent study, faster connections, and reliable operations of large loads, all while protecting customers from unreasonable cost shifting.

The proposal addresses five key topics from the FERC Order.

1. **Load interconnection applications, studies, technical standards, and operational requirements.**

Management first proposes to define large loads as end users behind points of interconnection with peak load of 50 MW or greater and interconnecting to the transmission system, namely the ISO controlled grid. This definition respects FERC's jurisdictional authority over the interstate transmission system without infringing on the State's authority over retail service and the distribution system. Management recognizes that the ISO's proposed definition does not encompass all load connections that may connect through the distribution grid and impact the transmission system, nor would it include loads less than 50 MW that connect directly to the transmission system. As the ISO develops tariff provisions to address FERC's specific concerns for large load connections to the transmission system, Management is taking care to ensure those provisions are properly integrated into the overall tariff framework. For example, management clarifies that the ISO will continue to study impacts to the transmission system of any large load that connects to the distribution system or load that falls below the 50 MW peak load threshold but connects to the transmission system. The ISO will continue to work with NERC and other regulators to address smaller and distributed loads in the future.

The ISO also proposes enhanced and ongoing coordination with the participating transmission owners on the load and resource interconnection processes and expects the participating transmission owners to align their load application processes with the ISO's resource interconnection process to ensure sufficient visibility for the ISO to plan for new large loads and maintain reliability once they are interconnected.

The ISO will enhance its process for reviewing and documenting load interconnection requests through concurrence in the Transmission Planning Process to ensure reliability and consistency with long-term plans. Specifically, the ISO will review any specific out-of-cycle transmission additions or upgrades associated with large loads on a monthly

basis in order to accommodate FERC's 60-90 day process requirement for participating transmission owners' load interconnection studies.

In addition, the ISO proposes the following technical requirements:

- Require hourly forecasts, telemetry, and other operational data necessary to provide the ISO with sufficient operational visibility;
- Utilize communication protocols for the ISO to coordinate with the participating transmission owner to remotely disconnect large loads when necessary to maintain transmission system reliability, and;
- Establish requirements for maintaining communication channels between the ISO and transmission customers serving large loads.

For operational awareness, the ISO also proposes to require specific information from participating transmission owners during the interconnection process.

2. Cost transparency and customer protection

The ISO expects participating transmission owners to establish just and reasonable provisions in their tariffs in order to prevent cost shifting from one customer to another. The ISO is clarifying how proper implementation of the existing transmission access charges (TAC) will prevent unreasonable cost shifting between participating transmission owners' customer bases. Fair accounting of participating transmission owner revenue requirements and annual transmission revenue credits will ensure that only the revenue requirement net of contributions that participating transmission owners receive from large loads is used to determine the regional high-voltage TAC set by the ISO and recovered across all loads and exports.

In response to FERC's request for improved transparency around costs, the ISO will publicly post aggregate amounts of proposed large load additions in the ISO operating area; planned network upgrades needed to accommodate large loads; and cost estimates for each planned network upgrade identified as needed for large loads.

3. Enabling co-located large loads and generation

Management proposes to create a transparent pathway for the ISO and participating transmission owners to study co-located large loads and generation together. These procedures provide clarity for both greenfield projects and existing generators, enabling faster and more efficient studies for co-located facilities. Management proposes to document existing ISO and State rules that allow onsite generation without an ISO study so long as it only serves onsite load. On the other hand, generation that will inject energy onto the grid will require an ISO interconnection study to determine the impact

on the grid and any affected systems. However, the ISO generator study process will coordinate with the participating transmission owner's load study process to identify the most cost-effective transmission solutions for their shared interconnection.

In addition, to address concerns around generation withdrawing from the ISO market to serve onsite load, the ISO clarifies the recently developed policy requiring generators to notify the ISO if they intend to repower or retire from the ISO system so the ISO and others have full awareness and can understand the implications of such actions on Resource Adequacy.

Consistent with the Order, Management also proposes to require large loads co-located with generation to meter the load's demand independent of offsetting energy so they can be assessed their due charges for ancillary services.

4. **Flexible Interim Load Interconnection (FILI) Service**

Management proposes to create a flexible interim load interconnection (FILI) offering that would enable large loads to interconnect flexibly and receive service up to a certain level based on grid conditions and constraints until network upgrades are complete, at which time the large load would switch over to receiving firm interconnection service. This will likely be a bespoke option for each large load based on its point of interconnection and the constraints it faces, and to be developed through a contractual agreement with the participating transmission owner. This option provides flexibility to the participating transmission owners, ISO, and developers to customize solutions. The ISO is offering this framework, which will require customer-specific study results from the participating transmission owners to operationalize.

The ISO will explore a permanent flexible load interconnection option to enable large loads to operate flexibly in a future stakeholder initiative.

5. **Future consideration of interconnection of large loads with electrically proximate generation**

The ISO will explore provisions for interconnection customers to serve electrically proximate large loads in a future stakeholder initiative. Based on stakeholder feedback, the ISO intends to prioritize the more common stand-alone and co-located load and generator interconnections with this proposal and filing and will focus on proximate load and generation arrangements once the process for co-location is underway.

POSITIONS OF THE PARTIES

Parties were generally supportive of the ISO's straw proposal and draft final proposal. Parties emphasized the importance of developing additional detail on specific examples and processes to clarify the topics proposed in the draft final proposal. The ISO intends to convene working groups and develop additional guidance in the business practice manual over the coming months to clarify timing and implementation details. In addition, the ISO is coordinating closely with the participating transmission owners as they develop their tariff filings and expects to see additional detail on how their processes will align with FERC's direction and the ISO's proposal. FERC's order was clear that compliance should not disrupt existing commercial arrangements.

The ISO received comments from several parties, including Southern California Edison and Cal Advocates, suggesting that the ISO take an expanded role on several issues related to load interconnection studies and prevention of cost-shifting. Management believes the ISO has struck the right balance in terms of the division of responsibilities with the participating transmission owners.

Pacific Gas & Electric noted concerns with the scope of the ISO draft final proposal based on its interpretation of the ISO's definition of large loads. The ISO is committed to respecting FERC's jurisdictional considerations, and is working with PG&E, the CPUC, and other stakeholders on consensus tariff language that respects jurisdictional lines. PG&E's concerns with the definition carried through its comments on all other elements of the ISO's proposal, with support for various elements of the proposal conditioned upon PG&E's defense of their position on the definition.

In addition, several stakeholders sought commitments for a new stakeholder initiative to consider permanent flexible interconnection service for large loads seeking to operate flexibly in order to avoid network upgrades, as well as interconnection of electrically proximate loads and generation. The ISO has included a stakeholder initiative to address these items on its draft Infrastructure Policy Roadmap and expects to begin policy development in early 2027.

CONCLUSION

Management recommends approval of the large load draft final proposal and forthcoming 205 filing with FERC. This proposal will ensure continued proactive planning and study of large loads, protect customers from inappropriate cost shifting, enable faster interconnection of large loads, and ensure continued reliable operations as both loads and resources become more dynamic.